GVEP International

ANNUAL REVIEW 2015

ACCELERATING ACCESS TO ENERGY

GVEP International

Front cover by Axel Fassio
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CEO's MESSAGE

"Scandalous". That is how one Prime Minister in the region described the energy access situation in sub-Saharan Africa. In some ways, it is hard to disagree with him. Not only are 728 million people still cooking using traditional means, but 622 million people have no mains electricity, and these statistics are still going in the wrong direction.

Amongst the many consequences of this: 600 thousand people die prematurely from indoor air pollution each year; inadequate power infrastructure holds back African GDP growth by between 2 and 4% annually.

However, there are grounds for optimism. There is now intense activity amongst the international community and by national governments, with all eyes (at the time of writing) on the COP21 meetings in Paris.

For GVEP, the greatest promise and progress can be seen in the performance of the private sector businesses that we work with. In our last Annual Review we reported the seven million people enjoying improved access to energy due to the growth of the businesses we support. **Today that figure totals 11.7 million.**

We are proud of reaching 11.7 million people – but the credit must go to the entrepreneurs in sub-Saharan Africa whose vision and tenacity have made this possible. This growth is testament to two things: the huge contribution that small businesses can make to eradicating energy poverty and the effectiveness of our model.

Like the businesses that we work with, our voice in international debates and meetings can seem quite small. Yet on the ground our impact is powerful; whether we are helping an entrepreneur to identify, for example, new routes to market or enabling that entrepreneur to secure vital new capital.

In this review, you will find many examples of the different ways we are working with entrepreneurs (who run very varied businesses), to help them realise their visions of profitable growth whilst expanding energy access. Of the nearly 3,000 businesses we worked with in the last five years over 250 are SMEs, larger businesses with significant growth and development plans, and 2,500 are micro-enterprises, often in rural areas.

The energy sector is rapidly changing, so we must ensure we change with it. This is clear from the projects that have started this year. In Tanzania, we are working with private sector partners to support a series of new mini-grid projects. In Senegal, we have developed a major women's economic empowerment project focused on rural energy access. In Ghana, we are experimenting with an innovation prize in the LPG market. Globally, we are trialling new approaches to use crowdfunding to accelerate energy access. And, in a world where refugees are very much in the news, we have started a major initiative looking how the humanitarian sector can better support the energy needs of displaced persons, and the role of the private sector in this area.

If energy poverty is indeed a scandal, then GVEP is proud of our progress in 2014/15 to address it. That progress could not have been achieved without our funders, our staff and the entrepreneurs that we serve. To all of them – and to our Trustees – I offer my recognition, respect and thanks.

"Like the businesses that we work with, our voice in international debates and meetings can seem quite small. Yet on the ground our impact is powerful"

Domestic stove, Central Kenya.

CONTENTS

ENERGY POVERTY AND GVEP'S MISSION

GVEP International is a non-profit organisation working to alleviate poverty in developing countries through increased access to sustainable, renewable energy.

Our **vision** is one where everyone has a better quality of life through access to clean energy.

Our **mission** is to help micro, small and medium sized energy businesses to access capital, technology, operational advice, expertise and networks, which enable them to become profitable and to sustainably deliver access to clean energy. We also contribute to the development of our sector by sharing the lessons we learn.

Where we work

GVEP's team of energy and finance professionals operate in Africa and are supported by a small UK head office.

We have offices, run programmes and work with energy businesses in Kenya, Uganda, Tanzania, Rwanda and Senegal.

GVEP's mission is rooted in our belief that efficient markets, served by successful private enterprises, can contribute significantly to expanding energy access and result in solutions that are longer lasting and better value for money than traditional aid-led approaches.

Our work is more relevant than ever. The international community, in defining global priorities for 2015 to 2030, has included energy access as Sustainable Development Goal number 7. It is the golden thread that connects economic growth, increased social equity and environmental sustainability.

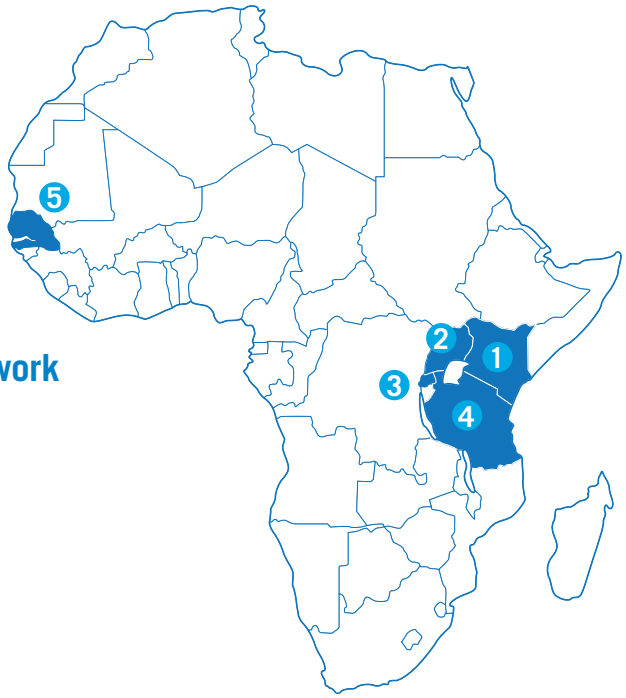
Yet the developing world's energy crisis and its social, economic and human costs often go unreported. Inadequate and unreliable electricity undermines investment and remains a major impediment to economic growth. Indoor air pollution caused by the smoke from burning firewood kills four million people a year worldwide – half of them children. Health clinics are unable to refrigerate life-saving vaccines and children are denied the light they need to study. We aim to change this.

To meet the world's energy needs, more than $48tn in investment will be required over the next two decades, as estimated by the International Energy Agency. This is a challenge that the public sector cannot address alone[1].

In spite of positive trends showing a 17% increase of global investment in renewable power and fuels over the last year – and a 36% investment growth in developing countries – only 9% of the world's electricity generation (excluding large hydro) comes from renewable sources[2].

However, investment will not materialise unless stable economic and policy frameworks are in place. Wider efforts are also required to secure private sector investment and further mobilise financial markets to support a low-carbon economy.

The international energy community is hopeful that steps in the right direction will be made following the Paris COP21 meeting in December 2015 (ongoing at the time of writing), where 196 countries gathered to sign a new climate change agreement. A stronger commitment on behalf of policy makers and further attempts to unlock investment for sustainable growth are the desired outcomes.



Where we work

1. Kenya
2. Uganda
3. Rwanda
4. Tanzania
5. Senegal

ENERGY GAP IN NUMBERS

Nearly **2.7 BILLION** people, (almost 40% of the world population and about half of those living in developing countries, rely on firewood for cooking

1.3 BILLION people worldwide live without access to electricity (18% of the world population) and a further 2.5 billion have unreliable mains electricity.

728 MILLION people in Africa use inefficient, polluting methods of cooking (67% of the population)

97% of those without access to electricity live in sub-Saharan Africa and developing Asia

38 million

30 MILLION more than two years ago (in Africa)

622 MILLION of these are in Africa

600,000 Africans die each year as a result of household air pollution, half of them being children under the age of five.

22 MILLION more than the previous year (in Africa)

22 million

These numbers illustrate how rapid population growth can continue to outpace the rate of electrification in many countries, concealing the progress that has been made so far. Source: IEA, World Energy Outlook 2014

IMPACT

This year we have passed an important milestone: 10 million people with improved access to energy as a result of our work. Our latest records show that 11.7 million people are now enjoying modern energy services and products.

We are proud of this number as it is not only our achievement, but the achievement of the nearly 3,000 businesses that we have supported over the past five years.

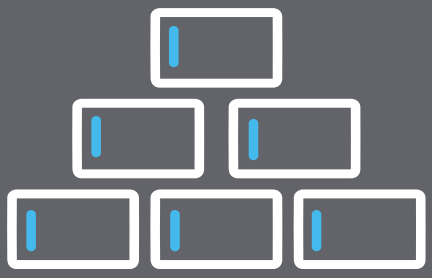
Their work has also resulted in:

- 8.6 million tonnes of CO_2 avoided thanks to renewable technologies
- $86 million raised through grants, equity and debt finance
- Over 7,800 jobs created in Africa

Over the last year we made significant progress in our enterprise development programmes by supporting:

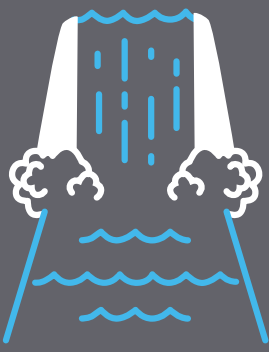
11 institutional improved cookstove makers in Uganda

businesses engaged in productive use in Senegal

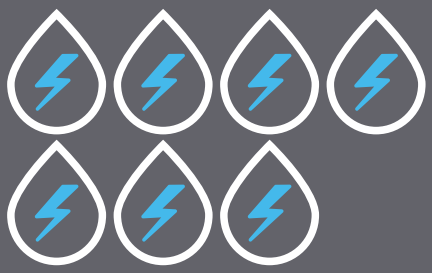


94 briquette businesses in Kenya and Uganda

16 off-grid lighting SMEs in Rwanda and Kenya

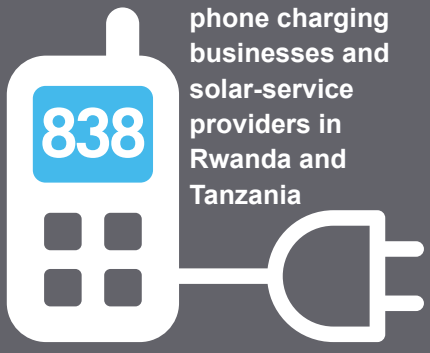


15 pico-hydro (1-50 kilowatts) project developers in Rwanda



7 small hydro projects in Rwanda (0.2 – 5 MW)

domestic cookstove makers in Kenya



phone charging businesses and solar-service providers in Rwanda and Tanzania

SMEs and project developers

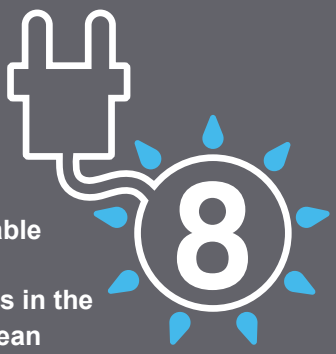
We are also a founding partner of the Kenya Climate Innovation Centre (KCIC), which has supported 121 early-stage climate technology companies.

To facilitate access-to capital, we have helped arrange 400 micro loans for micro-scale enterprises, mostly through our Loan Guarantee Fund, and also through our partnership with Kiva Microfunds.

For larger businesses, we have supported more than 70 clients in accessing over $42m of funding – a combination of debt, equity and grants.

We also channel grants provided by donors to qualifying enterprises, and we supplement this with technical assistance. This year we have done that for:

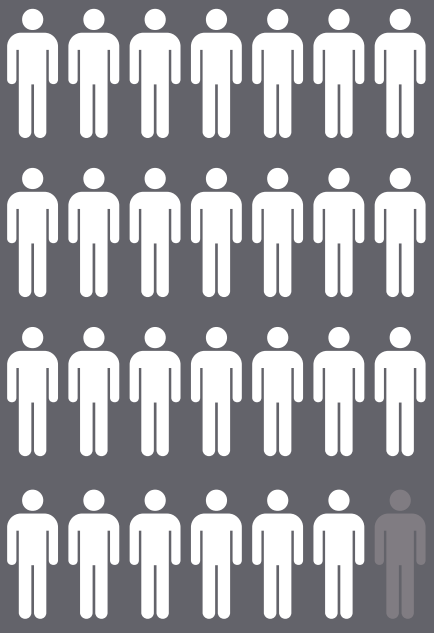
15 off-grid lighting SMEs in Kenya and Rwanda



8 renewable energy projects in the Caribbean

12 businesses engaged in productive use in Senegal

3 mini-hydro developers in Rwanda



34 of the KCIC clients in Kenya

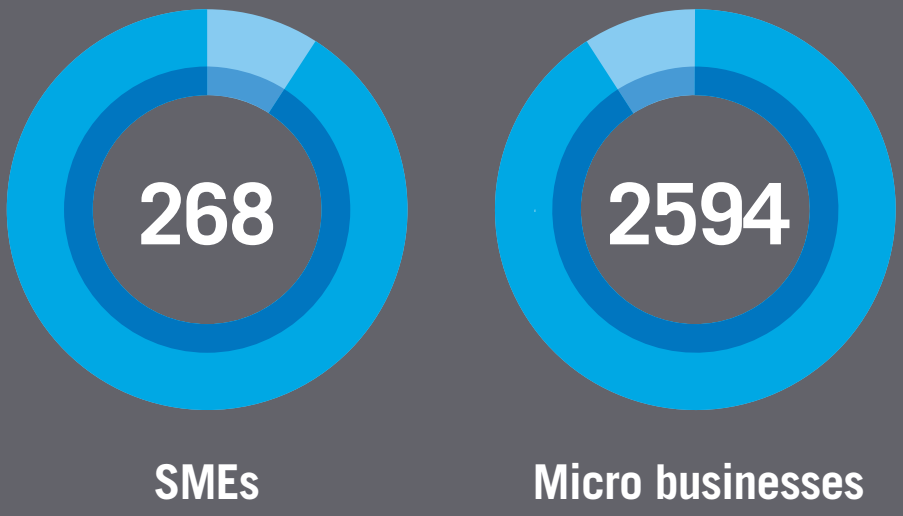
12 stove makers in Kenya

8 briquette makers in Kenya

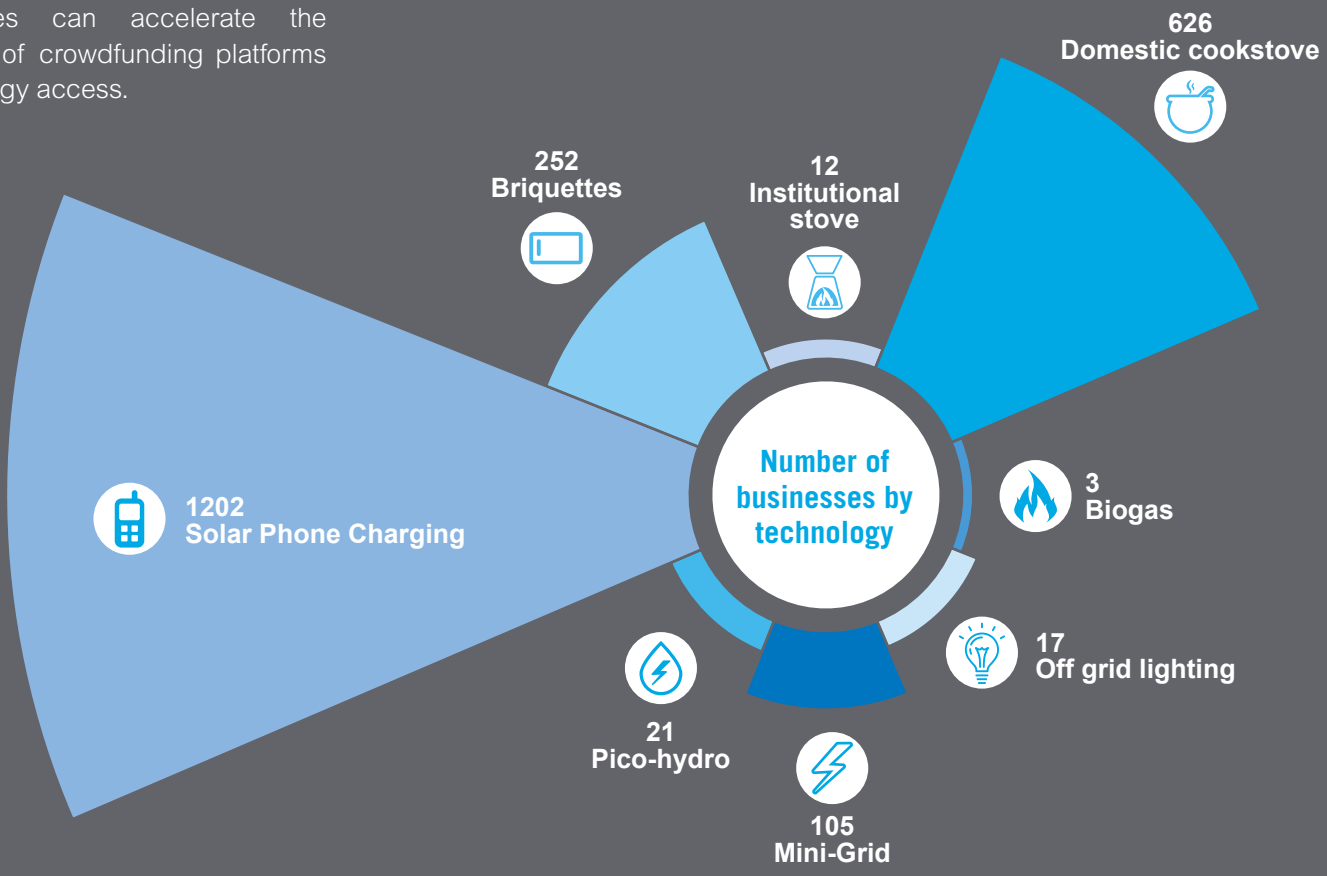
We provided support for a commercial distribution of 5,000 pay-as-you-go solar home systems in Rwanda in partnership with Azuri Technologies and local suppliers, funded by a $1m grant from USAID. We built the technical capacity of 12 stove makers in Kenya, funded by the Global Alliance for Clean Cookstoves (GACC), and the Adventure Project

We are implementing, as part of a consortium, a DFID funded programme that will award £7.5 million of prize money to parties, which deliver effective solutions to problems in the areas of climate mitigation and adaptation, energy access, water and sanitation.
We are also implementing a three year pilot programme, which seeks to test how grants by public agencies can accelerate the impact of crowdfunding platforms on energy access.

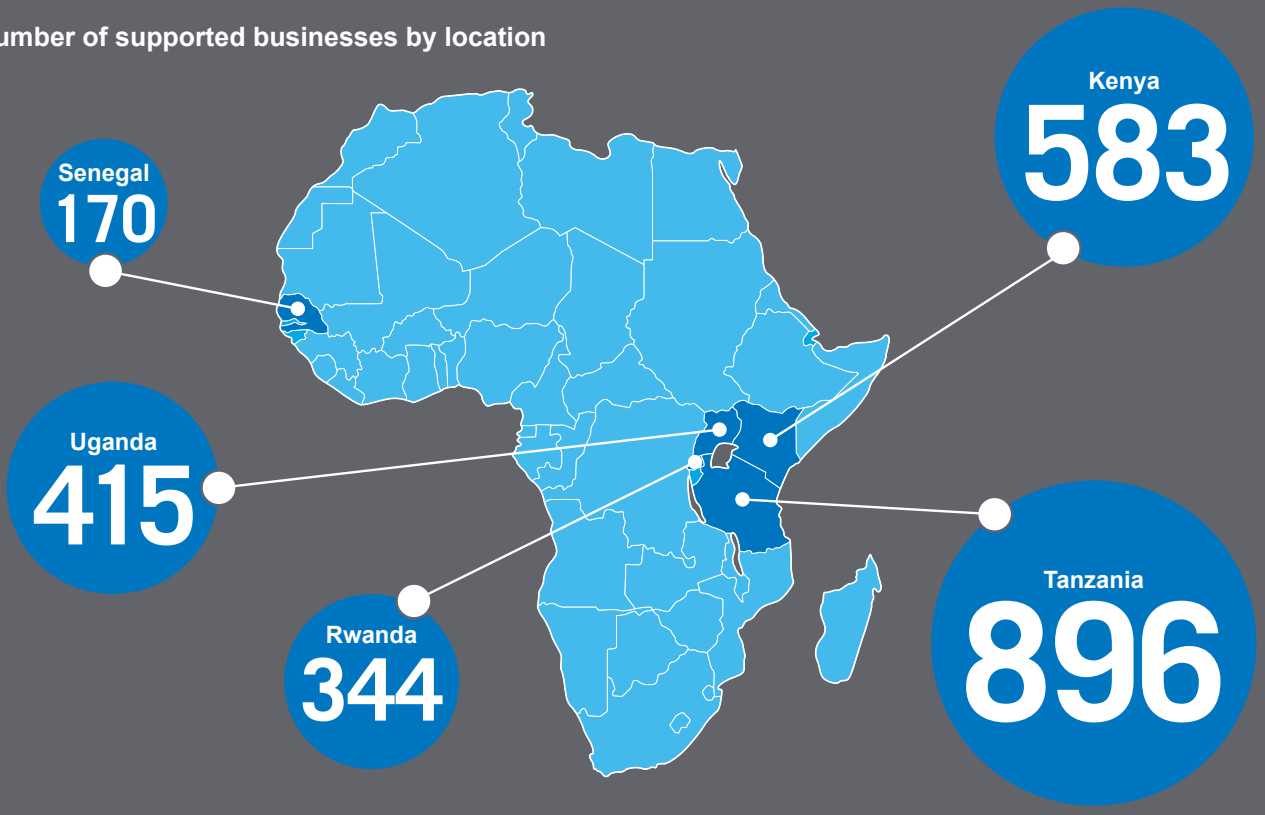
Number of supported businesses by type



Number of supported businesses by technology



Number of supported businesses by location



Population with access to energy by technology

- 1,444,700 – Solar
- 1,100 – Biogas
- 8,875,500 – Domestic cookstoves
- 398,900 – Institutional cookstoves
- 185 – LPG
- 699,500 – Briquettes
- 351,400 – Other

OUR WORK

A holistic approach

A report published in 2015 estimates that 138 million African households living on less than US$2.50 a day spend US$10bn annually on low-quality energy products, including charcoal, candles and kerosene[3].

This represents a significant business opportunity for the private sector, as most rural households are not likely to be served by public utilities in the near future. Although grid connectivity is expected to improve, nearly 60% of the additional generation required to achieve universal electricity access by 2030 will need to come from off-grid solutions – both stand-alone and mini-grids[4].

The delivery of energy through decentralised services is the natural domain of small and medium enterprises which use distributed, renewable technologies – this is the sector that we support.

However, there remain many challenges: developing appropriate technologies; building effective product distribution channels; proving and adapting business models and accessing finance.

GVEP's approach is to support the growth and development of enterprises serving the off-grid energy market by addressing each of these challenges.

Skills: We train entrepreneurs in business planning, sales, marketing and record keeping, and then provide ongoing mentoring support. We provide specialised advisory services to larger businesses to support strategic and financial planning, supply chain and operational management and project development and financing.

Technology: We provide technology-related training and advice, assistance with product sourcing and manufacturing, and offer advice to businesses that are developing new technologies – or applying existing technologies in new contexts.

Capital: We work with financial institutions, investors and donors to help them better understand the local energy sector, including its technologies and business models. We also work with entrepreneurs to improve their ability to secure funding by facilitating access to equity, debt and grant funding.

Delivery network: We help entrepreneurs develop their supply chains and distribution/routes to market. We leverage deep and broad sector knowledge to facilitate partnerships amongst a wide range of market participants including governments and regulators, consultants, service providers, equipment suppliers and distributors.

In order to help the energy market function, we believe we must engage with all the players in the market and help them work together efficiently and effectively to deliver energy access.

These players include micro businesses, SMEs, project developers and innovators. In this chapter we will look at our engagement with each of these players more fully. We will also pay special attention to the role that women play in delivering access to energy and the relationship between energy access and women's economic empowerment.

Finally, we are working on the energy needs of refugees and displaced people, arguing that the international community must engage to find better models for energy delivery in humanitarian contexts – at a time when the world is faced with the worst refugee crisis in our era.

Micro energy enterprise development

Micro enterprises (employing less than ten people) are an important source of employment and income in developing countries. This is especially true for micro energy businesses in rural areas, where it is very difficult to find income opportunities outside of farming.

Micro energy businesses also have the virtue of operating in "the last mile" and being an integral part of the supply chain, expanding energy access to rural areas. Last mile distribution is a major stumbling block for energy product suppliers, who are deterred by the uncertainties and the affordability of reaching out to remote areas.

The growth of micro enterprises often translates into jobs and income growth, both directly and indirectly – when products and services enable the growth of other businesses. Despite their significance, micro enterprises tend

to remain small and unproductive, mainly due to competition amongst themselves and from large firms, lack of access to credit, lack of management skills and shortages of reliable and affordable supplies.

GVEP has a wealth of experience supporting micro entrepreneurs to grow their businesses by linking them to others in the supply chain or assisting them in accessing finance. We have worked and continue to work with donors interested in funding rural development or renewable energy access; or investors seeking better engagement with the last mile.

We have supported 2,594 micro businesses through East and West Africa that are providing various energy services and products ranging from solar charging, solar home systems, domestic and institutional energy efficient cookstoves and biomass briquettes for heating and cooking.

Case Study: How training gave Alphonsine the tools to earn her living and provide vital services to her community

Alphonsine (centre) holding an award she received during the International Day of Rural Women by the Ministry of Trade and Commerce, recognising her contribution to enhancing rural development.

Four years ago, Alphonsine Nyirahabimana and her husband struggled to generate a sustainable income as subsistence farmers. Living in a remote community in Gisagara district, South Rwanda, they also had to travel for miles to charge their mobile phones. Armed with entrepreneurial spirit, she saw her community's energy shortage as a business opportunity and opened a battery-powered phone charging facility in 2011.

However, lack of technology and business management skills hampered her potential.

GVEP approached her in June 2014 and offered her training on business development and technical and market development support to help increase her productivity. With initial capital of 50,000 Rwandan Francs ($72) she bought a solar panel to power her charging equipment.

Her business is now serving residents of several neighbouring communities, enabling them to avoid long journeys to distant charging locations. Her increased profitability has also allowed her to open a barber shop and a canteen in addition to her phone-charging business.

> "My business has shown tremendous improvement in the last year. My monthly income has seen a 25% increase, and I have even been able to open up a new solar phone charging outlet"
>
> *Alphonsine Nyirahabimana*

Alphonsine's business success was acknowledged during the International Day of Rural Women celebrations in Gisagara, Southern Province, when she was recognised for her contribution to the eradication of poverty by the Rwandan Minister of Trade and Commerce.

Market development activities

GVEP organises market development activities to promote product awareness and demand, facilitating the flow of information and accelerating development of the sector. Over the last year, 149 market development activities were held in Uganda, Tanzania, Kenya and Rwanda, which benefitted stove and briquettes makers, solar phone charging and solar home system businesses. This resulted in increased sales and strengthened commercial relations. The photo shows a biomass briquette producer at a market informing a potential customer of the energy efficiency and cost-effectiveness of his product.

Working with SMEs to achieve scale

Unlike micro businesses, many SMEs (which we define as having more than 10 employees), have the ability or the potential to address energy access issues on a larger scale. These are commercially viable companies with significant growth potential and sound knowledge of business models and local market dynamics.

Some of these companies are selling household-level solutions – cookstoves, solar-charged lanterns or solar-powered kits that can light up homes and charge cell phones. Others are developing biogas, solar, or small hydro mini-grids, generating enough electricity to light up homes, businesses, schools and clinics in a community.

They are innovative and resourceful in both generating and distributing energy, and in collecting payment for their services – even in the most remote areas of Africa. Some of these companies are using new kinds of technologies to meter use, manage energy distribution, set up a network of "pay-as-you-go" energy vendors and to collect payments via mobile money.

Many are locally founded and run, but some are international, developed by entrepreneurs from the US or Europe. GVEP works with both types of SMEs, offering each business what it needs most, whether that is access to capital providers or understanding of new markets.

To deliver this work we have a dedicated Advisory Team with a range of banking, legal, technical and investment backgrounds. They provide a variety of services in financial, strategic and technical areas, all with the aim of making companies investment-ready and ultimately increasing energy access at a large scale.

Makindye School, Uganda)

Energy efficient cookstoves in schools

In Uganda, GVEP works with 11 cookstove makers providing certified high quality stoves to schools. This year alone those businesses installed 356 stoves in 148 schools, benefitting almost 94,000 students and staff, who can enjoy properly cooked and timely meals, as well as a smoke-free environment. The schools are able to save up to 60% of the cost of firewood, with a significant positive impact on their budget and the environment.

Case Study: Strategic advice to a company offering B2B Pay-As-You-Go solutions

Angaza Design offers a complete Pay-As-You-Go (PAYG) solution to manufacturers and distributors of clean energy products, such as solar lights or mobile phone chargers in off-grid areas. This technology allows consumers to purchase PAYG-ready products over time, in affordable increments, just like they purchase cellular airtime or kerosene fuel.

The past few years have seen a significant shift towards PAYG business models which allow businesses to target customers further towards the bottom of the pyramid. The likes of M-Kopa and Off Grid Electric are examples of companies that are scaling fast, and whose business models offer customers PAYG opportunities. Angaza provides an affordable B2B solution which can support businesses in making this shift, providing them with both the hardware and software to enable them to become PAYG ready.

GVEP has been working with Angaza to raise money to fund their next phase of growth including introducing them to investors and facilitating discussions with those that showed interest.

A group of business women trained in the use of charging kits.

Supporting project developers

GVEP brings a specialist skill set to project developers who are building assets to generate power to sell to a mini-grid in a community or to the main grid, or both. We help parties recognise and understand real versus perceived obstacles and how to advance projects towards financial close and commissioning, particularly those that involve complex technologies, multi-party financing and interaction with regulators. The growth of these businesses will result in expanded access to clean energy for many people.

In Rwanda, GVEP has been supporting small hydro projects (from 0.2 to 5 MW) in a variety of ways. We have carried out technical site assessments and feasibility studies, advised on financial models and business plans and helped with access to grants, equity and debt.

We are pleased to report that three of these hydro projects have recently received government grants of $600,000, constituting part of the capital requirement of the projects, which enable the leveraging of funds from banks and investors. Altogether the plants will make a significant contribution to the government electricity generation target of 533 MW by 2017, by injecting 6 MW into the national grid. This will increase the number of connected households, health and education facilities.

Another class of project developers are local entrepreneurs seeking to build village-scale mini-grids powered by very small-scale hydro projects (typically 1-50 kW), known as pico-hydro. Over the last year we have worked with 15 pico-hydro project developers in Rwanda, providing technical support (from site identification to system and distribution network design, and turbine manufacturing), project management and training on business plan development and access to finance.

Access to finance

Access to finance is key to the successful development of business; helping entrepreneurs in this area is a vital part of our work.

While private/commercial capital is fundamentally the right solution, there is still an important role for public funding to catalyse and underpin private investment in early stage markets. We help design and implement private and public/private capital solutions by providing transaction advice and investor introductions, as well as credit enhancement.

We help companies prepare for raising capital, define their capital needs, prepare investor materials, prioritise potential financiers and negotiate a transaction. We also make introductions to investors, lenders and other capital providers in certain circumstances.

GVEP also offers guarantees to lenders to micro enterprises we have vetted and mentored, for loans from $500 to $20,000. The guarantees are intended to increase the availability of lending and to decrease its cost. Overall we have helped 400 rural micro enterprises and entrepreneurs to obtain loans for starting, expanding or diversifying their businesses.

In the past year, we have supported several companies to launch crowdfunding campaigns, as innovative energy access projects are increasingly turning to crowdfunding to address their financing need. In addition, since little is known about the effectiveness of crowdfunding to kick-start projects in developing countries, we have recently embarked on a three-year initiative to research the impact of crowdfunding on energy access in Sub-Saharan Africa and Asia.

Letshego bank staff, GVEP business mentor and capital access officer and entrepreneurs after signing a bank loan to purchase solar light and phone charging kits, Rwanda.

GVEP has been supporting hydro developer Kwitonda Dermon to upgrade his pico plant, which is currently providing power for six households, one church and one commercial entity. The 7.5 kW increased capacity will be able to extend power supply to 70 households, 17 commercial entities, three churches and two schools.

The debt challenge: what we know

> "To address this, GVEP has worked hard to identify financial partners whose strategic priorities are aligned with ours, and then to improve their understanding of the sector and its business model"

Improving access to credit is about bridging the gap between the supply-side (the lender) and the demand-side (the borrowers). Our experience suggests the amount of supply and demand is not the key problem; banks and other lenders have capital to lend, and many companies want to borrow. However, the flow of information and funds between the two is a widespread, almost universal problem.

The biggest impediment to the flow of private credit is the banks' need for "viable demand". For banks, applying a purely commercial analysis with a limited social and environmental mandate, the demand is made viable by being: a) low risk (i.e. borrowers highly likely to repay at the end of the loan term and provide security in the interim) and b) at scale. These are material issues when lending to a new sector (renewable energy) and into a traditionally unbanked sector of the population, (with no credit history, no account history, new to managing cash and managing a business etc).

To address this, GVEP has worked hard to identify financial partners whose strategic priorities are aligned with ours, and then to improve their understanding of the sector and its business models, and their capacity to operate effectively within it. On the other side, we work with enterprises to improve their ability to make a case for, and then to manage, loans.

Our experience suggests that establishing capital facility will not on its own solve a capital access challenge; well-targeted technical assistance is also crucial.

Our loan guarantee scheme, designed to create the flow of credit, is one such capital facility. The key value of this scheme may be reduced collateral requirements and simplified process rather than reduced interest rates. A 10% loan is not much different to a 12% loan. A requirement for 100% collateral in the form of land, vehicle title or even household chattels is a much bigger impediment, and if a guarantee reduced that requirement to 50% or less, more micro businesses and small SMEs can become borrowers.

Even then, reduced collateral, reduced interest rates and the availability of technical assistance are not on their own sufficient to create viable demand at scale. That involves a much wider range of issues and steps, focusing around building an environment or ecosystem in which micro businesses, SMEs and renewable energy can all be seeded, take root, grow and thrive. So we need to understand the policy environment, the market, access to technology and the supply chain, entrepreneurs' capacities and the labour market, etc. Therefore, access to capital interventions have to be set in a much wider and more complex context and not seen as a standalone solution or magic bullet. This is why GVEP's model is to apply an integrated, holistic approach.

Case Study: Helping micro businesses acquire loans to expand

Solar powered mobile phone charging station in Tanzania.

When GVEP's Tanzanian team met Joseph Nkubaa, he was running a barbershop business in Ng'haya village, in northwest of Tanzania, close to the shores of Lake Victoria. As a side activity he was also charging phones for his customers using a car battery. This earned him an average monthly revenue of Tanzania Shillings 150,000 (approximately $90), but he had ambitions to expand.

The team supported him through the application process with a local bank for a TzS 1million loan (roughly $600), which he obtained in May 2014.

Joseph bought a solar phone charging unit that enabled him to serve more customers. Soon after his monthly revenue doubled.

Using the knowledge he acquired from GVEP's mentoring on managing a business, record keeping and saving for the future, Nkuba was able repay his loan in full and on time a year later.

Joseph used his savings not only to expand his solar phone charging business but also to diversify into providing solar-powered photocopying services and selling solar lanterns. This increased income allows him to take care of his parents' needs and pay school fees for his younger brother. Recently, he was also able to acquire a piece of land.

"Joseph used his savings not only to expand his solar phone charging business but also to diversify into providing solar-powered photocopying services and selling solar lanterns"

Promoting innovations

People with innovative ideas, technologies and business models can significantly contribute to increasing energy access. As innovations involve risk, finding capital to support research and development, pilot studies or field trials can be challenging, particularly in emerging markets where potential funders may be put off by the difficulty of making a proper assessment of the risks involved.

GVEP supports innovators in various ways, including providing financial and technical assistance to realise their ideas, developing their management and business skills, and providing access to resources or facilities required to grow their businesses.

GVEP is also a lead member of the consortium managing the Kenya Climate Innovation Centre (KCIC), that provides business incubation services – including small grants, business and financing advice, networking opportunities, access to information, testing and office facilities – to companies with innovative ideas to develop a green and climate resilient economy in Kenya.

Over the last three years GVEP has engaged with 34 renewable energy start-up companies incubated by KCIC, supporting them with capital-raising, strategic and technical advisory services, project development, financial planning and analysis, marketing and distribution advice.

Case Study: Business innovation for renewable energy mini-grid owners

Solar mini-grid in rural Kenya.

SteamaCo is a Nairobi-based company that provides smart metering technology to solar mini-grid systems to power homes and businesses in off-grid areas in East Africa. As a result, some fishing villages on Lake Victoria and other rural communities in Kenya are benefiting from clean light and power for the first time.

Solar power is not new to the area, but what's exciting about SteamaCo is the technology behind it: the micro-grids use an innovative cloud-based remote metering and payments system that monitors energy use, allows people to pay for power using their mobile phones, and quickly troubleshoots any problems.

With around 80% of Kenyans lacking access to electricity, SteamaCo is helping to bring the benefits of clean energy to increasing numbers of off-grid customers.

SteamaCo's technology can also be used to remotely monitor and control the usage of electricity, fuel and water in other applications, allowing businesses to better manage their energy assets.

GVEP has supported SteamaCo in raising capital by introducing them to investors, as well as advising them on their business planning and pitching strategies.

Energy to enhance productivity

Access to power can dramatically enhance income generation opportunities and productivity in rural areas for a whole range of commercial activities and small industries, from agriculture and telecommunications to education and health facilities, clean water and refrigeration services.

A clean and stable energy supply results in power for machinery and affordable lighting (which enables longer opening hours and safer conditions for employees and customers). For some businesses, it is not possible to exist, or remain sustainable, without reliable and cost-effective energy.

Farmers, for example, can benefit from improved irrigation and crop processing leading to increased productivity and income. Their ability to access weather forecasts, information on prices in local markets and agronomy advice depends on whether they can charge mobile phones or power TVs and radios.

However, in most cases, access to modern energy alone does not guarantee increased levels of economic activity. A more systematic approach is required to build the capacity of local businesses and their ability to take advantage of the improved power supply.

GVEP provides enterprise development support to enhance and diversify productive uses. We do so by offering access to finance, business training and mentoring to help businesses make more informed decisions on the use of electricity to increase business productivity and profitability.

Case Study: Agro processing companies and mini-grids in Tanzania to be powered by rental solar farms

Due to unreliable power infrastructure, many food processors in Tanzania depend on expensive diesel generators to avoid unproductive hours or even days during power cuts.

Redavia is a company providing low-cost energy through fully-removable solar farms on flexible contracts. Their low-cost per-kWh rental solar farms give businesses and communities immediate access to energy, without the upfront costs of buying a solar farm outright. Their service includes full operations and maintenance.

Redavia has teamed-up with GVEP to roll-out a mini-grid leasing model for agro processing companies and communities in Tanzania. Over the next few months we will partner with agro processing companies in Tanzania that suffer from unreliable electricity supply and are looking for a stable and affordable source of electricity.

Solar farm

The gender dimension of energy access

Women and girls are disproportionately affected by energy poverty, as they spend hours each day collecting firewood, cook on smoky cookstoves, and rely on poor lighting to do their household chores.

Access to clean energy can have a huge impact – resulting in healthier environments to cook and live in; more time for self-improvement; less exposure to drudgery; and empowerment, as women have more control over choices and financial resources. Energy also provides significant entrepreneurial and income generating opportunities for women, who play an active role as producers and suppliers of energy products.

However, when it comes to finding effective solutions, women are not adequately consulted, as the energy sector remains largely male-dominated both at the technical and decision making levels.

Social norms that view the provision of energy services and products as 'men's work' also limit women's opportunities. As a result, women's potential as policymakers, producers and suppliers of energy services remains under-utilised throughout the developing world.

GVEP is increasingly emphasising gender issues and incorporating gender action plans across its East African programmes. We are also running two complementary programmes in Senegal:

The first is focussed on improving the position of women in the energy access market, and involves delivering technology, business and financial mentoring to 250 women entrepreneurs in rural Senegal, so that they can increase access to energy products and services in their communities.

The second has an advocacy angle and aims to influence gender mainstreaming in energy policies and programmes. Specifically, it advocates for the integration of clear gender objectives in the SE4ALL national action plan and investment prospectus; and raises awareness of the importance of women's economic empowerment in the energy sector.

"Access to clean energy can have a huge impact – resulting in healthier environments to cook and live in; more time for self-improvement; less exposure to drudgery; and empowerment, as women have more control over choices and financial resources"

Case Study: Businesswomen thriving through clean technologies

When women are given equal access to opportunities, they have the same chances to thrive, as Mrs. Kandé and Mrs. Diallo, two successful entrepreneurs, have proven.

When Mrs Kandé started her "Latiere Bilaame Pul Debbo" dairy in 2002, she was producing as much milk as she could refrigerate – roughly 100 to 150 litres per day. Demand for fresh, pasteurised milk is large but her ability to upscale her production was limited by the inability to power larger machinery and fridges.

Technology and business mentoring from GVEP, along with financial support in the form of a grant, changed all that. Mrs Kandé used the grant to upgrade her machinery with modern technologies: the two small freezers that preserved the milk were replaced with solar powered tanks and a cold room, enabling her to save energy costs and double her production to 200/300 litres per day. This success encouraged her to recruit six new staff members, which increased her team from seven to thirteen.

Mrs Diallo, owner of "GIE Mun'al", an enterprise that processes sheanuts, baobab fruits and cereals such as fonio, used to outsource the processing of her agricultural produce due to lack of appropriate machinery and power. This ate into her profits and kept her business from growing. With support from GVEP to access a grant, she built a partly solar-powered processing unit and moved the processing in-house. This initial investment doubled her turnover within the first year. But the benefits extended beyond her business, creating direct employment for fifteen local women, indirect employment for farmers engaged in the production of raw materials, and for retailers selling her products.

Women's entrepreneurial activities are proven to have a positive impact not only on the economic development of the communities in which they live, but also on the well-being of their families. Most importantly, they are a boost to women's confidence. Both women have become role models for many aspiring businesswomen in Senegal.

Energy in the humanitarian context

There are nearly 60 million forcibly displaced people worldwide, and many of them have poor access to energy. Within refugee camps, power for facilities such as health centres, schools and administration compounds, is commonly provided by diesel generators. Refugees often rely on traditional biomass for cooking, and kerosene or torches for lighting. Outside of camps, which in fact is where most refugees live, the energy access challenges mirror the circumstances of the host populations, although the extra pressure put on finite resources and infrastructure can often add to the challenges.

In an effort to upgrade the international response to the energy needs of displaced people, the Moving Energy Initiative was set up by GVEP, leading a consortium of Chatham House, UNHCR, the Norwegian Refugee Council and Practical Action. Supported by the UK's Department for International Development, the initiative is undertaking research and conducting pilot projects to test new approaches to providing energy access and management in humanitarian interventions.

In particular, it focuses on sustainable energy solutions for heating/cooling, cooking, lighting, water and sanitation, communications or other purposes. The initiative will generate best energy practice, whether in terms of camp management, service provision, business models and private sector engagement, or partnerships with local authorities. The aim is to support the widespread adoption of new practices.

"In an effort to upgrade the international response to the energy needs of displaced people, the Moving Energy Initiative was set up by GVEP and our partners"

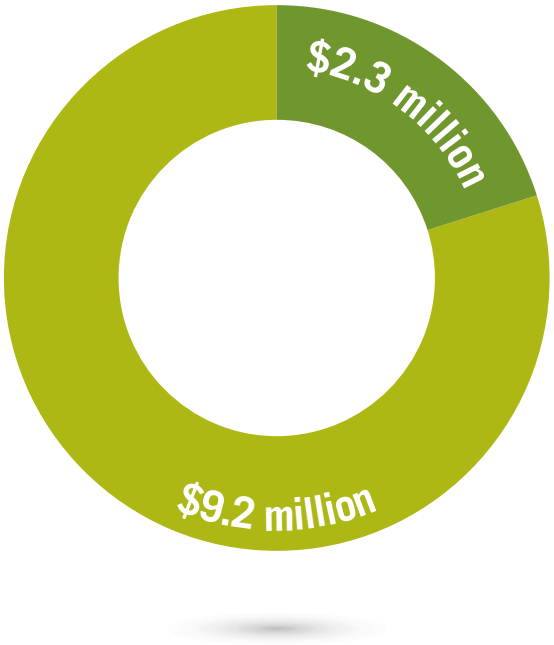


Figure below: *Annual spending on camp administration and operations compared to refugee household spending on energy (cooking and lighting) at the Dadaab refugee camps, Kenya.*

Source: Interviews with camp operators and refugee households at the Dadaab refugee camps, by GVEP International for the MEI, 2015.

Case Study: Moving Energy Initiative Early research findings

In an attempt to estimate the scale and cost of current energy use and CO_2 emissions among refugee households, we undertook a global level and local surveys of the energy economy in humanitarian situations.

A review of technology options for energy access has been carried out – this includes reviews of cooking, lighting, heating and energy for productive use – where the solutions are applicable – as well as their economics and the requirements for their adaptation.
An assessment of options for alternative business models and private engagement was also undertaken with an aim to gain industry experience of supplying to the humanitarian sector.

Some of the initial findings of this research include:

- There is a huge opportunity both to save money and deliver environmental, health and social benefits. We estimate that the energy costs borne by the refugees themselves, is about $2.1 billion/ year; firewood consumption is equivalent to 49,000 football pitches of forest per year, and CO_2 emissions are about 13 million tonnes/year.
- An indicative global investment of about $300 million in improved energy provision could result in annual savings equivalent to a one year payback.
- There are significant institutional barriers to improving the situation, including the complexities of coordination with host governments, a historically limited emphasis on, and expertise in, energy amongst humanitarian actors, and an often challenging funding and financial planning environment.
- Despite the challenges, there are significant opportunities for innovation in the way the sector engages with the private firms to deliver improvements, and, amongst those firms, there is significant appetite to participate.

Based on these and other findings, we are now designing an implementation phase for the initiative, which will trial our ideas for new ways of managing energy access in the sector, and will also increase the capacity of the sector, as well as increasing clean energy access for thousands of people.

LEARNING AND INNOVATION

The off-grid energy access sector is highly dynamic. Technologies and business models are constantly evolving, and understanding what does and doesn't work is critical to the success of any enterprise. Donors are also continually looking for more efficient and effective ways to deploy public funds in order to encourage private investment.

At GVEP, we place considerable emphasis on evidence-based planning of interventions – we gather and analyse data, and conduct specific pieces of research, in order to better understand the markets we work in.

Over the past year we have undertaken a significant amount of research on factors influencing the growth of energy micro businesses in Tanzania and Kenya (see Box 1), and looked at the impact that access to micro loans has on the lives of the business owners. We also completed a detailed study of the impact of solar home systems on rural households in Rwanda (see Box 2).

In the Ideas to Impact programme, funded by the UK government, we are experimenting with 'innovation prizes' as a development tool. GVEP leads the 'energy access' strand within the programme. The programme is working with the Ghana Government and the LPG industry on increasing access to LPG for cooking (see Box 3).

We have already mentioned the energy access challenge that displaced populations face around the world. GVEP is leading a consortium of partners through Moving Energy Initiative that are experimenting with a number of innovative approaches designed to improve energy supply through the involvement of private sector actors.

In a third programme funded by the UK government called Crowd Power, we are investigating the potential of crowdfunding platforms to provide access to finance for innovative young businesses seeking to serve customers in the off-grid energy markets in sub-Saharan Africa and Asia. As well as mapping the current scale of activity and tracking trends over the next three years, the project will offer fund matching on donation, debt and equity platforms with a view to expanding the numbers of businesses and investors connecting through these platforms.

Research outputs and learning from all of these programmes are actively shared with the development practitioner community through publications, workshop presentations and inputs to key policy forums.

"At GVEP, we place considerable emphasis on evidence-based planning of interventions – we gather and analyse data, and conduct specific pieces of research, in order to better understand the markets we work in."

Box 1. How do micro enterprises grow?

From 2008 to 2013, GVEP worked with hundreds of micro businesses, in our Developing Energy Enterprises Programme (DEEP). The project covered Kenya, Uganda and Tanzania, and the businesses supported were mainly engaged in manufacturing improved cookstoves and briquettes, and providing phone charging services using solar PV.

Two years after the programme ended we went back to see what had happened to these businesses, to see whether our work has a lasting impact, and to understand what factors contributed to growth amongst those still operating.

We surveyed over 150 DEEP entrepreneurs in Kenya – of these, 79% were still operating.

We also conducted in-depth interviews with 17 surviving businesses in Tanzania and Kenya, combined with a review of academic literature on the informal sector.

Around half of the surviving businesses reported that they had expanded, and many had employed additional workers. There was a strong correlation between businesses which expanded and those which took loans. Businesses which had secured loans during DEEP were three times more likely to take out a loan in the subsequent two years than businesses which had not borrowed during DEEP. This reinforces our belief in the value of interventions in the credit markets which help to get the first deals done, so that, if the experience of the first deals is positive, then more will follow, and liquidity is increased.

The levels of survival and expansion are high for informal sector businesses. This is partly a testament to the value of the services we provide. Also, we are careful in selecting businesses with potential to succeed. The research shows that successful business owners were more likely to have secondary school education or above, compared with businesses which stagnated or failed. They are usually married and are mature adults. There were no significant differences in the performance of male and female-led businesses. These findings will be used to refine the ways we recruit and support micro businesses in the future.

Box 2. Solar home systems bring light to rural households

In Rwanda, GVEP has been working with Azuri Technologies and their distributor Serve and Smile on developing the solar home system market with funding provided by USAID.

Our role included a baseline survey at the start of the programme and a follow-up study towards the end. The purpose was to find out how off-grid communities lit their homes and charged their phones. Ability to afford the weekly payments for the Azuri product was also assessed.

The follow-up study involved interviews with both Azuri customers and a control group of households with a similar demographic. Households using the Azuri product were shown to have more than four hours of light per day compared with less than two hours for both the 'baseline' and 'control groups'. Use of mobile phones as torches increased in households with the Azuri system.

The majority of households using Indigo also used other lighting devices like torches, and some phones were charged outside the home. Indigo customers did not necessarily save money as result of adopting the product. In some cases they spend more for an increased energy supply. They will save money once they have paid for the Indigo unit. Use of mobile phones as torches increased amongst Indigo users because of the ease of recharging phones.

Box 3. Using innovation prizes to improve energy access

Prizes have long been used as a way of stimulating technological innovation. More recently, governments have started to use innovation prizes to tackle social issues. The Ideas to Impact programme was set up to test the application of innovation prizes in a development context. GVEP leads the energy access component of the programme.

The initial phase of work involved a wide ranging review of potential applications of innovation prizes in the energy access field.

Interviews with 120 key informants highlighted policy, financing and distribution as the major barriers in the sector, not technological issues. Many were sceptical that an innovation prize could solve these problems.

The programme is designed to test whether prizes can help support policy reform and stimulate investment. Three awards will be made within the energy access prize programme, all aimed at supporting the Ghana Government in the implementation of reforms in the LPG sector. The government aims to dramatically expand access to LPG for cooking.

FUTURE OUTLOOK

GVEP's immediate strategy is unchanged. We will remain focused on what we do best: helping small energy businesses to grow in order to expand energy access. We will keep doing that by providing those enterprises with business and technical advice, and helping them to access capital.

We believe we are well-positioned to continue to make a strong and growing contribution, from a good funding base. This is for three reasons.

First, what we do is important. It is reflected in the 7th Sustainable Development Goal – Ensure access to affordable, reliable, sustainable and modern energy for all – and supports multiple other priorities for donors: general economic development, rural livelihoods, entrepreneurship, gender equity, financial inclusion, education, health, climate change mitigation and adaptation, and habitat protection.

Second, we are at the leading edge of an issue of particular interest to the development agencies: how best to leverage the skills, capital and drive of private businesses in order to get things done. This is a complicated question with multiple answers, but as we have shown in this Annual Review, GVEP believes that our experience in working with all kinds of businesses, from the very small scale village entrepreneur upwards, and all kinds of financial institutions, will be critical in finding the answers.

Third, we are set up to deliver real value for two key stakeholders: our client businesses and our funders. We are a "front-line" organisation, offering on-the-ground presence, a good range of enterprise development services based on direct practical, business-oriented experience, and a low overhead structure. That means, for client business, we can be flexible and responsive, with specifically tailored solutions. And for funding agencies, we can serve as an excellent intermediary between them and the small businesses they wish to support.

In the medium term, our goal is to have a cumulative impact of 20 million people with better access to energy by 2020. Notwithstanding the great progress reported in this Review, that is a big target, and we shall be very proud if we make it. Not just because that achievement will be a great credit to GVEP, but also because that is a huge number of people to have in their lives more light, less smoke and better livelihoods.

> "In the medium term, our goal is to have a cumulative impact of 20 million people with better access to energy by 2020"

To progress towards that target we are investing in making our approach both wider and deeper. By "deeper", we mean getting better at what we do. That is partly about developing our internal capabilities as a delivery organisation. But it also has a vital external dimension: by working with the innovators in the sector – whether the innovations relate to technology, business models or financing structures – we are learning more and more about what works.

By "wider", we mean doing more of what we do. This is partly about replicating successful models in new places within our existing operational countries. But it is also about finding ways to apply our approaches in new countries or situations, perhaps where the normal preconditions for functioning markets and private sector participation are less clearly in place. An obvious example of this is the humanitarian sector.

In the short term, our priorities are:

- To focus on the efficient and effective delivery of the remaining phases of our established programmes, notably CARE2, Ideas to Impact, the Climate Innovation Center and our Women's Economic Empowerment work in Senegal, and where appropriate to consider options for follow-on work

- To establish the momentum in new programmes, including recently announced ones such as Crowd Power and The Moving Energy Initiative, and those that will be secured in the course of the year
- To manage effectively the synergies across our programmes, particularly in relation to operational effectiveness and business development opportunities
- To continue our business development activities in order to build a steady stream of potential prospects to replace and build on our established programmes as they approach maturity.

Energy poverty is an enormous, persistent injustice, blighting people's lives and holding back wealth creation. GVEP's impact may be small compared to the scale of the problem, but we are proud of what we have achieved and optimistic about what we can be do in the future. And if we meet our objectives, and if the businesses we work with can become beacons of hope for the sector, then we will owe that success to the commitment of the team, our trustees, our sponsors and our client entrepreneurs. Thank you to all of you.

FUNDING

GVEP's activity level as measured by total expenditure increased slightly in the year to 31 March 2015, to £4.5m from £4.4m in the previous year. This increase is not reflected in the comparison of total incoming resources for the two years, because a proportion of the £4.7m received during the year ended 31 March 2014 was advance funding for work to be performed in the year to 31 March 2015

Detailed below are our main grant funders in 2014/15, together with a brief summary of the projects/ activities funded in each case.

Donor	Programme
World Bank (Government of Russia)	**Energy SMEs Programme (ESME)** – A five-country programme funded by the Russian government through the World Bank and various host government agencies. Businesses involved in productive use applications for energy, small hydro project development, clean cookstoves and solar product distribution in East and West Africa are being supported with various forms of grant funding, as well as advisory services on technical, financial and operational issues.
World Bank/infoDev (Governments of Denmark and UK)	**Kenya Climate Innovation Center** – A consortium providing business incubation services – including small grant and investment capital, business advice, as well as access to information, workshops, laboratories and office facilities – to climate technology start-ups. Benefitting from $4 million of operational funding for four years, in addition to over $4 million of investment capital, the KCIC supports 121 enterprises improving access to energy, water and sanitation, and agricultural productivity in Kenya. GVEP is a lead partner of the consortium.
Swedish International Development Cooperation Agency (Sida)	**Capital Access for Renewable Energy Enterprises (CARE2)** – a three-year $7.1 million programme targeting the creation of 3,600 new jobs in 1,400 e-MSMEs (micro, small and medium energy-focused enterprises) and addressing multiple barriers to growth in Kenya, Uganda, Tanzania, and Rwanda. CARE2 has three components: an Enterprise Support Team which provides business, financing and technology advice to SMEs; a Capital Access programme that provides access to finance; four country projects, targeting specifically defined niches and designed to stimulate the creation and growth of energy businesses in cookstoves, mobile phone charging, briquettes and other markets.
UK Department for International Development (DFID)	**IDEAS2** – an Energy Innovation Contest focused on innovative projects and ideas promoting renewable energy, energy efficiency and access to energy in the Caribbean. The 8 awarded ideas awarded ideas ranged from a biogas system using waste from local hotels and farmers in Jamaica; to an affordable solar power and micro-financing model bringing energy to remote communities in Suriname; to a gasifier, which drives a 20kW turbine supplying electricity for a micro-grid in Haiti, among others. **Ideas 2 Impact** – GVEP is part of a consortium, which is implementing a five year programme supporting innovation in the development sector. The programme will run five prize challenges designed to incentivize innovative problem solving around key challenges in energy access, water and sanitation, and climate adaptation. GVEP is the energy access theme lead on the project team. **Moving Energy Initiative** – GVEP is leading a consortium of other expert organizations, on a ground-breaking new project which seeks to meet the energy needs of refugees and internally displaced persons in a manner that reduces costs, is safe, healthy and respectful. The initiative will emphasize the relevance of local realities, and integrate them with global technological advancements, through the development of research, evidence-building and pilot projects relating to sustainable energy solutions.

SEED Initiative/Adelphi Research Gmbh	**SEED Fund project** – GVEP has been retained to provide business advisory and investment-readiness services to enterprises in Kenya and Tanzania that have been selected as winners by the SEED initiative.
USAID/Azuri	**Indigo solar lighting: PAYG with Azuri Technologies** – this $1m programme aims to deploy 10,000 solar home systems in Rwanda in a sustainable and ultimately self-financing way. GVEP is supporting both Azuri and its in-country distributors, and we aim for the project to provide a template for future deployment of pay-as-you-go (PAYG) solar systems in other countries.
The United Nations Foundation/ The Global Alliance for Clean Cookstoves	**Spark Fund** – an initiative which aims to improving the performance and quality of locally manufactured efficient cookstoves in Kenya. Through this programme, GVEP has provided support to high-potential cookstove businesses to improve their technical, product design and manufacturing capacity and practices. A seed fund has also been established which provides capital for these companies to expand their activities.
The Ministry for Foreign Affairs of Finland: Energy and Environment Partnership (EEP)	**Jumeme** – GVEP is implementing a mini-grid demonstration project in partnership with private energy businesses INENSUS and Terra Projects, and St. Augustine University of Tanzania that aims to connect nearly a thousand households and 350 businesses, with GVEP playing a key role in developing productive use demand. The funding granted by EEP will be used to showcase the project and aim to unlock the commercial capital necessary for the next phase: 15 more rural villages, serving a total population of 80,000.
ENERGIA (governments of Finland, Norway and Sweden)	**Energy Opportunities for Women in Senegal** – This three year initiative, implemented with local partner SEM Fund, aims to improve livelihoods, incomes and employment in rural areas in Senegal, via support for 250 micro-enterprises engaged in both expanding energy access and productive uses. **Integrating gender issues in energy policies in Senegal** – GVEP and SEM Fund are also delivering an Advocacy and Communication Programme to influence gender mainstreaming in energy policies and programmes in Senegal. With funding and support from ENERGIA, we are advocating for the integration of clear gender objectives and actions within the SE4ALL national action plan and investment prospectus; and raising awareness of issues related to women economic empowerment within the global campaign on Energy, Women, Children & Health.
Opec Fund For International Development (OFID)	**Nyundo Project** – With an OFID grant funding contribution worth about $500k, the project aims at increasing sustainable electricity output in Rwanda by constructing an on-grid plant that will increase the overall grid capacity by about 3%.

GVEP also had the following newly secured pipeline funding commitment as of July 2015:

DFID: Crowd Funding For Development	**A Crowd Power** – is a three year programme (starting in May 2015) to stimulate, develop and learn from crowdfunding into renewable energy enterprises in sub Saharan Africa and Asia. DFID has committed a total of £845,000; (i) £600,000 to provide direct financial support to crowdfunding campaigns trialling a variety of approaches such as match-funding, guarantees (insurance), and/or grants or "gift" funding, and (ii) £245,000 provided to GVEP to run the programme and produce in-depth research and analysis of renewable energy crowdfunding campaigns in developing countries.

Unrestricted reserves stood at £647,157 as at 31st March 2015, representing a 29% growth on the previous year's figure. The increase is mainly on account of an increase in consultancy services rendered, improved administrative cost efficiencies and higher donation receipts. The charity aims at a strategic and sustainable growth of its unrestricted reserves in furtherance of its general charitable and business development activities

Statement of financial activities for the year ended 31 March 2015

	2015 Unrestricted £	2015 Restricted £	2015 Total £	2014 Total £
Incoming resources				
Incoming resources from generated funds:				
Voluntary income	805,893	2,288,946	**3,094,839**	4,588,773
Investment income	251	866	**1,117**	1,603
Contracts	162,550	-	**162,550**	149,267
Total incoming resources	968,694	2,289,812	**3,258,506**	4,739,643
Resources expended				
Costs of generating funds:				
Fundraising and publicity	60,204	-	**60,204**	61,911
	60,204	-	**60,204**	61,911
Charitable expenditure	630,725	3,770,872	**4,401,597**	4,318,198
Governance costs	68,698	-	**68,698**	38,806
Total resources expended	759,627	3,770,872	**4,530,499**	4,418,915
Net incoming resources/net movement in funds before transfers	209,067	(1,481,060)	**(1,271,993)**	320,728
Transfers between funds	(60,871)	60,871	**-**	-
Net incoming resources/net movement in funds before transfers (being net income)	148,196	(1,420,189)	**(1,271,993)**	320,728
Funds at the start of the year	498,954	1,746,226	**2,245,180**	1,924,452
Funds at the end of the year	647,150	326,037	**973,187**	2,245,180

1 IEA, World Energy Investment Outlook, 2014 https://www.iea.org/publications/freepublications/publication/WEIO2014.pdf

2 Global Trends in Renewable Energy Investment 2015, Bloomberg New Energy Finance

3 POWER, PEOPLE, PLANET, *Africa Progress report 2015 http://www.africaprogresspanel.org/publications/policy-papers/2015-africa-progress-report/*

4 ACCELERATING OFF-GRID RENEWABLE ENERGY, IOREC/IRENA 2014:http://www.irena.org/DocumentDownloads/Publications/IRENA_2nd_IOREC_2015.pdf

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