Looking back: How EnDev capitalises on its 15+ years of experience

endev

Energising change

Contents

Delivering impact in a changing world

A message from Alexander Haack, Programme Director EnDev (GIZ) and Jan Cloin, Coordinator EnDev (RVO)

Achieving the SDGs and implementing the Paris Agreement, two cornerstones of international regimes that aim to improve the lives of all people on this planet, are becoming more and more ambitious with each passing year. Cross-sectoral solutions are needed to address the climate crisis as well as the energy crisis while softening the economic fall-out from the war in Ukraine and the COVID-19 pandemic.

Today EnDev provides a range of solutions to contribute to solving these crises with a comprehensive approach that addresses immediate needs for poor and vulnerable groups. EnDev ensures that access is provided on higher qualitative levels and is coupled with economic development. As a result, markets are enabled to leverage resilient and long-term business models.

EnDev is able to utilise its long-standing experience to be adaptive in times of crisis and creative in implementing new solutions and technologies - to the benefit of the people that are in most need and that at the same time often are most exposed to external crisis. For instance, EnDev has been delivering immediate support throughout the COVID-19 pandemic, such as lifeline support to companies and individuals as well as the ongoing electrification of health centres in rural areas.

The many accomplishments, presented in the following pages, would not have been possible without the continuos support of our donors and partners. The EnDev team relies on its core donors: the German Federal Ministry for Economic Cooperation and Development (BMZ), the Netherlands Ministry of Foreign Affairs (DGIS), the Norwegian Agency for Development Cooperation (NORAD), and the Swiss Agency for Development and Cooperation (SDC) for their strategic guidance and continued support.

But most important to the success of EnDev is the team behind the name: We are truly honoured and grateful to work with people who are pursuing our mission in difficult circumstances and fragile countries, in challenging environments and against many uphill battles – you are the ones who truly make a difference, every day!

This is how we were able to reach over 25 million people with energy access – each with their own individual story. It is time to give these millions of people a voice and tell their transformative stories. We warmly invite you to explore this compilation of the last 15 years of enabling access to modern energy in more than 20 countries around the globe.

Enjoy the read and get inspired!

Acronyms and Abbreviations

CLASP	Collaborative Labeling and Appliance Standard Program
DGIS	Directorate General for International Cooperation
EnDev	Energising Development
FCDO	UK Foreign, Commonwealth & Development Office
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HIVOS	Humanistisch Instituut voor Ontwikkelingssamenwerking
NORAD	Norwegian Ministry of Foreign Affairs
PUE	Productive Use of Energy
RBF	Results-based Financing
RVO	Netherlands Enterprise Agency
SDC	Swiss Agency for Development and Cooperation
SNV	Netherlands Development Organisation

Stories from three continents

Latin America

Bolivia
Honduras

Africa

Benin
Ethiopia
Ghana
Kenya (I)
Kenya (II)
Liberia
Malawi
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Rwanda
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Asia

Bangladesh
Cambodia
Indonesia
Nepal
Vietnam

As of 2022. To learn about the current EnDev´s portfolio, visit the official website.

Benin

Water for the farm:
Households and social institutions in rural Benin benefit from off-grid solar products

In a remote corner of Benin, among oil palms and cassava fields, a dirt track leads to a thriving organic farm. Here, in the village of Tangnigbadji, Priest Wilfried runs a girls' agricultural training centre. Under his guidance, ten trainees aged between 12 and 24, all of whom are early school leavers, are learning about animal husbandry, plants and crops, product processing and marketing. Rural Benin is heavily dependent on farming, and the skills taught at 'Ferme Monseigneur de Souza' are invaluable for the girls' future job prospects. However, when Priest Wilfried took over in 2017, the two-hectare farm was struggling. As with the majority of Benin's population, the farm also had no access to electricity. Fuel for the generator, which ran a pump to supply the farm's water, cost the equivalent of 125 euro each month. It repeatedly broke down and water was scarce. To keep the farm running, Priest Wilfried and the trainees travelled long distances to collect water. However, this was unsustainable, and soon the training centre was forced to stop water-dependent farming activities altogether.

Life at 'Ferme Monseigneur de Souza' improved significantly in 2018 when the company Jesuton installed solar panels on the farm to convert sunlight into electricity. This was used to power a pump. Like Jesuton, 20 other energy providers participated in EnDev's Results-based Financing (RBF) project between 2014 and 2019. For every installed cookstove, solar pump or lamp, businesses received incentives, making the energy sector more attractive for them. Over the five years of the project, almost 280 solar pumps and 59,000 household solar systems have been sold through the scheme, enabling energy to be generated in a healthy and safe way. Today, around 170,000 people, 220 social institutions (such as health centres), and 140 small and medium enterprises benefit from sustainable access to solar systems and the opportunity to replace diesel generators.

On the 'Ferme Monseigneur de Souza', the water supply is now reliable, plentiful and low-cost. The trainees have re-started all farming activities, and the organic crops are abundant. Residents of Tangnigbadji, which is home to 1,200 people, come to the farm for drinking water and fresh produce. Priest Wilfried is now targeting the sustainability of the farm. He hopes to acquire additional water tanks, buy improved cookstoves to reduce the centre's dependency on firewood, and invest in batteries to store the energy produced by the solar panels. With these batteries, he can use the energy for lighting. As Priest Wilfried explains: *"Without the solar water pump, the centre would not be able to function. Now, we plan to expand, take on volunteers to benefit the girls' training, and employ technicians to help manage the centre."*

Learn more about current activities in Benin:
https://endev.info/countries/benin/

On the ‘Ferme Monseigneur de Souza’, the water supply is now reliable, plentiful and low-cost. The trainees have re-started all farming activities, and the organic crops are abundant.

Kenya

Entertainment on your doorstep: A Kenyan island enjoys the advantages of excellent off-grid appliances

Simon Otieno is the first to admit that there isn't much to do in his village, perched on rocky Mageta Island in Lake Victoria, Kenya. There are no cafés and very few shops. Like most islanders, Simon used to make a living catching fish. But, as he explains: *"Fishing is seasonal. Sometimes they're there, and sometimes they're not."* For many years, Simon and his family lived in a room behind one of the island's shops, unable to afford a place of their own. While the island has never been connected to the grid, some rooftops are dotted with solar panels, which provide light to a few homes. Until recently, no one here owned a television and the nearest TV was five kilometres away.

In 2018, Simon had an idea that would change things not just for his own family, but for his community as well: he decided to buy a solar home system and open a video hall. Now, dozens of villagers crowd into the modest room every day to watch the news, movies and football games, jostling for space on long wooden benches under the corrugated metal roof. During big football tournaments, up to 100 people squeeze in, cheering on their favourite teams. Simon's solar home system bundle incudes a 32" flatscreen TV, four lightbulbs, a radio and a flashlight, and costs him the equivalent of two euro per day. Simon charges an entry fee for movies and football matches, which allow him to finance the cost of the solar system. He also runs a small barber shop where he uses a solar-powered razor to cut men's hair, all lit by the solar bulbs included in his package. The solar appliances that Simon bought have been recognised by the Global LEAP Award, an international competition that selects the world's best off-grid appliances[1].

Connecting the Global LEAP Awards with a Results-based Financing (RBF) mechanism, companies that sold these products in Bangladesh, Kenya, Rwanda, Uganda and Tanzania were given incentives after pre-agreed results had been achieved and independently verified, such as the sale of the solar products. The Global LEAP – RBF mechanism[2] stimulated companies and kick-started markets for off-grid solar appliances.

1 The GlobalLEAP Awards is an international competition to identify and promote the world's best off-grid appliances, accelerating market development and innovation. This unique programme has evolved into a trusted global brand that serves as the de facto source of accurate, actionable information about the quality and energy performance of off-grid appliances.

2 The Global LEAP – RBF is one of 17 RBF projects of EnDev's DFID-funded RBF facility. It is implemented through the Efficiency for Access Coalition and managed by CLASP, an international non-profit organisation working towards mitigating the growing energy demand in the world.

> “During the FIFA World Cup the video hall will be full, because the people here love watching football. We feel good about it.”

By the end of 2019, over 328,000 high-quality off-grid TVs, fans, and refrigerators had been sold across the five countries. In 2019 and 2020, the incentives were extended to solar water pumps, off-grid refrigerators, and electric pressure cookers.

The advantages of the solar appliances extend beyond financial gains for Simon and the company that sold him the solar home system: Simon’s business has brought entertainment to Mageta Island. *“It’s great for the islanders”*, says Simon. *“Sometimes they wake me up to go and open the hall for them. During the FIFA World Cup the video hall will be full, because the people here love watching football. We feel good about it.”*

Learn more about current activities in Kenya:
https://endev.info/countries/kenya

Ethiopia

An (em)powered health centre: Rural health centres in Ethiopia are using solar energy to provide care for their patients

More than 16,000 people live in Korjo village, 370 kilometres from the Ethiopian capital Addis Ababa. Its mud-plastered houses with their corrugated sheet-iron roofs are scattered along both sides of a narrow dirt road with cows, sheep and donkeys grazing beside their owners' homes. Korjo is not connected to the power grid, which made life hard for Gutema Berhanu Geleta. The 27-year old was appointed head of the local health centre in 2016. When there were accidents at night, patients' had to be treated under the weak light of mobile phones or even torchlights. The centre had a single refrigerator, which ran on kerosene, to cool medication and laboratory chemicals. This required about 20 euro per month for kerosene – a significant amount for the limited budget of a rural health centre.

This changed in 2018, when EnDev installed a solar system here in collaboration with a local solar company. Gutema and his team can now treat patients safely at night and births no longer take place in the dark. Every room has its own light and plug sockets; two computers enable the staff to document their work and three refrigerators now store vital medicines. The laboratory has an electric microscope and electric equipment to analyse blood samples.

> “Electricity has improved our work and now I am able to serve my community better. This satisfies me as well as the community.”
>
> Gutema Berhanu Geleta

Laboratory technician Anteneh Tsadik is grateful for the improvements: *"It is now easier for me to detect illnesses such as tuberculosis and malaria."* Gutema is also pleased: *"Electricity has improved our work and now I am able to serve my community better. This satisfies me as well as the community."* And patients also notice the difference – patient numbers have grown by one third. Now, over 700 people come to the health centre every month, especially mothers and children.

Throughout the country, EnDev has supported around 200 Ethiopian health centres and 50 health posts to gain access to modern and sustainable energy by the end of 2019. To achieve this, EnDev has been collaborating with political partners, such as the Ethiopian Ministry of Water, Irrigation and Energy, which then launched the National Electrification Program "Light to All" in 2017. EnDev has also provided training to private companies which planned, sized, and then installed solar systems at health centres and health posts. Today, more than 5.3 million people benefit from the improved structures and services.

Learn more about current activities in Ethiopia:
https://endev.info/countries/ethiopia

Ghana

Reliable electricity creates thousands of jobs:

How ‘light industrial zones’ brought small enterprises into the spotlight as motors of local economic growth for their patients

In Ghana’s Bono East Region lies the town of Tubodom, home to 45-year old Emmanuel Essey. Here, as in many Ghanaian towns, small enterprises are clustered along roadsides or in market places. One of these shops is *Shalom Straightening and Welding Enterprise*, owned and managed for the last 27 years by Emmanuel. For much of that time, life was tough for the father of four. Emmanuel used diesel generators, which he rented for up to the equivalent of 160 EUR each week. The generators broke down frequently, making them not only expensive, but also unreliable. This resulted in low productivity and a limited income.

Life changed in 2009, when Emmanuel was introduced to EnDev’s grid extension scheme for small enterprises. Within this project, EnDev facilitated and supported 18 districts in Ghana to establish ‘light industrial zones’. Between 2006 and 2016, with the help of the Ghanaian Ministry of Trade and Industry, local governments and industry associations, around 1,200 enterprises were established or supported to relocate to these zones, helping to create 3,500 jobs and encouraging local economic growth as well as de-congesting town centers and reducing strain on the local infrastructure. Like Emmanuel, these enterprises now benefit from reliable access to energy seven days a week, as well as supporting infrastructure like roads and sanitary facilities, which lets them focus on business growth. For Emmanuel, the jobs kept coming; this meant more money, but also more work. In 2019, he employed five apprentices, fulfilling his dream of training young people. Emmanuel said: *“My colleagues and I have benefitted immensely from the provision of electricity and we are grateful to the officials in charge.”*

Nationally, EnDev contributed towards mainstreaming support for small enterprises. The approach was to support decentralized economic growth areas in a way that relied on local and national stakeholders concerted efforts to make these light industrial zones reality.

> “My colleagues and I have benefitted immensely from the provision of electricity and we are grateful to the officials in charge.”
>
> Emmanuel Essey

The years of advocacy work and dialogue supported a paradigm change at the local and national level – whereas previous economic plans had concentrated primarily on the development of large industry, the government’s *Private Sector Development Strategy* when EnDev closed also addressed small enterprises. Small industries were seen by then as paying customers, rather than burdens to the urban grids, and were connected to electricity quickly after applying for a connection. The allocation of funds for districts’ local economic development activities, like infrastructure, had also become more common by 2019 - something that EnDev supported with advocacy work in order to make light industrial zones in rural districts possible. A number of government initiatives were also established to create more jobs and stimulate inclusive economic growth with small industries: the *National LED Policy Framework* (2015) for example guides districts to identify and support local small enterprises; and the *Coordinated Programme of Economic and Social Development Policies* (2017) recommends more support for existing and new industrial clusters at the district level. Outside the public sector, advocates for small enterprises have grown more influential: *Business Advisory Centres of the National Board for Small Scale Industry* now take part in budget meetings in each district capital; and the *Association for Small-Scale Industries* advocates nationally for their members.

Being a small entrepreneur like Emmanuel in Ghana still isn’t easy, but with increased support and resources, local small enterprises now have a fighting chance.

EnDev ended its interventions in Ghana in 2019 after 13 years of successful implementation.

Kenya

“The most positive change of direction I ever took”: In Kenya, millions of improved cookstoves change the lives of entrepreneurs and users

Kenneth Gachanja Kingori lives a life that many would envy: his children attend good schools, has private health insurance and owns two cars. In his early 50s, the businessman lives in a nice house in Munyutha, a village 90 km from Nairobi, in the shadows of Mount Kenya. Here, most people are farmers, working the fields or tending to livestock. Kenneth is a role model in his community. A public bus station is even named after his business: “Riumba-Ini”, meaning pottery soil. And it is to the soil that he owes his success.

Kenneth learnt his trade from his mother, who owned a pottery business. Things were going well, but his business really took off in 2006, when he met a team member of EnDev Kenya. EnDev had just started providing financial incentives and technical training to people working in the pottery business to produce improved cookstoves. Traditionally, cooking and heating was done on open fires or improvised shielded fires. This method resulted in constant smoke and a high risk of burns. The improved cookstoves are safe, save up to 50 percent of firewood compared to traditional stoves, produce less smoke and are thus better for users’ health, and for the environment. Between 2006 and 2018, EnDev supported around 4,000 producers and artisans to start making improved cookstoves available. And the initiative was successful: more than 6.5 million improved cookstoves have been produced and sold in Kenya within the project’s timeframe. In addition to reaching millions of private households, almost 2,000 social institutions today use improved cookstoves.

The Clean Cooking Association of Kenya (CCAK) plays a pivot role by coordinating several activities and representing stakeholders in the clean cooking sector in Kenya. Established in 2013 through support of EnDev, CCAK now has more than 120 members and strong relationships with ministries, governmental agencies and international donors. The sector association has developed a business plan and communications strategy, which helps to strengthen partnerships, increase recognition by the government and raise awareness about Clean Cooking issues. Improved cookstoves have also provided an economic benefit to the thousands of businesses producing them. Kenneth has grown into one of the largest stove producers in the country, with eight full time employees and up to 20 additional staff during busy periods. He outsources aspects of stove production to smaller producers, thus increasing economic activity, creating employment

for the community, and generating sustainable incomes. *“I am who I am and where I am economically and socially because of the technical capacity building I received” says Kenneth. “It is the most positive change of direction I ever took in my 52 years on earth. If you provide quality products and service, the money and recognition will follow. We even started exporting stoves to South Sudan.”*

Learn more about current activties in kenya:
https://endev.info/portfolio/kenya

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Liberia

An app for health and safety: Online solutions ensure functioning solar devices for health clinics in Liberia

Only 20 kilometres west of Liberia's capital, Monrovia, lies Gardnersville, a busy city with many small businesses and traders. Gardnersville is home to the R.H. Fergusson clinic, an important place for the 2,000 inhabitants of the city and surrounding area. For almost a decade, Felicia A.D. Tulay has managed the clinic and cared for the patients. She remembers well the days when the clinic had no electricity and had to rely on torches at night to treat emergencies. And when water had to be carried hundreds of metres in buckets from the well to the bathrooms. The 48-year old health worker experienced many life-threatening situations at the clinic: *"I want to help and save lives, to put a smile on people's faces and make an impact on their lives. But when pregnant women gave birth at night, there was a risk that something would go wrong, because there wasn't enough light"*. Felicia was therefore more than happy when the clinic received solar panels and a water pump from *Welthungerhilfe* in 2018.

> "... when pregnant women gave birth at night, there was a risk that something would go wrong, because there wasn't enough light."
>
> Felicia A.D. Tulay

EnDev facilitated the installation of the system and trained the clinic staff in its usage. With light and water inside the clinic, treating patients was easier and safer.

Since 2020, EnDev installed 430 solar home systems at public facilities and social institutions in Liberia. Solar power for the three largest labs enables light in treatment rooms, reliable biochemical and biomedical lab testing, power for smartphones or computers, and electricity for cooling drugs and vaccines. All of these institutions are enabled to register their systems on a web-based app – a tool that provides trouble-shooting and monitoring for the solar devices. The location of all solar installations are shown on an online map within the app, including key technical parameters. This ensures monitoring, maintenance and repair of solar systems. The app allows the clinic's staff and EnDev's solar technicians to access reports and data from afar, helping to resolve smaller problems remotely and bringing back the light. Monitoring and repair documents are imported into a publicly available map that shows solar systems and their status across the country. Up to now, around 400 people make use of the app, such as technicians, service providers, staff members from public facilities and social institutions.

In the R.H. Fergusson clinic, the system was put to the test in April 2019, when the water pump broke down. The staff had to go back to carrying buckets of water back and forth, risking hygiene at the clinic and thus patients' lives. Using the hotline and app, EnDev technicians were quickly made aware of the problem, re-connected the pump, supplied spare materials and maintained the system. With the reassurance of reliable maintenance, Felicia and the other 19 staff members of the clinic can focus on their work.

Learn more about current activties in Liberia:
https://endev.info/portfolio/liberia

Malawi

The Moses stove producers: Women in rural Malawi earn their living by manufacturing clay cookstoves

Southern Malawi in early March is awash with the yellow of acacia blossoms and the green of Baobab leaves. In the early morning, women cook breakfast in front of their homes on three-stone fireplaces, the rising smoke visible for miles away. Firewood and charcoal provide the country with over 90 percent of its total energy, but as the population grows, this reliance puts increasing pressure on biomass resources. In the Machinga district in South Malawi, Dassao and a group of women are taking steps to change this situation: they are producing *Chitetezo Mbaula*, which means 'protective stove'. Made from clay, these locally-produced stoves are practical and moved around easily, meaning that families can cook outside, reducing their exposure to smoke and protecting their health. The improved cookstoves use 30 percent less wood and are designed to emit less smoke – protecting the environment and health of the families using them.

As part of the UKAid-funded *Results-based Financing (RBF)* Facility, EnDev supported up to 65 production groups between 2015 and 2020 in Malawi, and provided incentives for each produced cookstove. Some of which today produce more than 7.000 stoves per month. To allow interested people to enter into this new market, EnDev's partner United Purpose organised stove production workshops for newcomers to the sector. Dassao was convinced. Together with two other women from her village, she learned how to produce *Chitetezo Mbaula* and then founded the 'Moses production group', named after the village leader. They produced over 10,000 stoves in three years, while also changing the stereotype that physical work and pottery weren't *'women's work'*. In 2018, the group had eight members and earned an income, that is about one quarter higher than the average in Malawi. The women are able to invest in their homes and send their children to secondary school or even university. Instead of earning money twice a year at harvest time, the stove producers earn all year round, which brings stability to families' financial budgets. Dassao speaks about their success: *"All of the women in our production group have been able to buy maize and other flour during the lean season. And I have also bought bricks to finish my house, and an iron roof."*

Today, Dassao and her colleagues are respected women entrepreneurs. Understandably, other villagers approach them looking to train as stove producers as well. In total, more than 370 people working with 22 stove production groups received training in manufacturing techniques, of which over 80 percent were women. The story was similar with the 850 sales agents recruited under the RBF project, of which around 60

percent were women, and who continue to sell the cookstoves and meet the demand even after the RBF project has ended. Until 2020, the stove production sector in Malawi overall has created jobs for 4,579 women and 1,124 men, and by December 2019, more than 1 million people in Malawi had gained access to improved forms of energy for cooking. And it is not just people and companies that benefit from the project – using the stoves cuts firewood usage and therefore protects the environment and climate. Over the 2-4 year lifetime of the stoves, 45,905 tonnes of CO_{2e} emissions will be avoided.

Learn more about current activities in Malawi:
https://endev.info/countries/malawi/

> “All of the women in our production group have been able to buy maize and other flour during the lean season.”
>
> Dassao from the Moses Production Group

Mali

Powering municipal offices – empowering democratic processes:
Social institutions in central and northern Mali benefit from solar energy

Life is simple in the rural community of Tesserela, in the south of Mali. Its eleven small villages can only be reached by dirt road, and most of the residents live from farming, often sharing their harvest with each other. Here, 39-year old Tahirou Touré is known as the "computer of the commune", because he manages every piece of official information that concerns the 6,500 people in the community. Tahirou's nickname was ironic at first: until last year, electricity was a luxury, and much of Tahirou's work in the town hall was done with pen and paper. To send e-mails to other offices, Tahirou had to bring his private laptop. When the battery died, he had to continue working on paper or drive 35 kilometres along a muddy road to Segou, the regional capital, for electricity. On top of that, working conditions in the town hall were not easy. During the day, temperatures in the office could often exceed 40 degrees. And in the evening, with no light, reading became impossible. These conditions bothered not only him, but the whole village, because the work required for necessary municipal functions took even longer.

In 2009, EnDev started its activities in Mali with the support of a wide range of technologies – from lightweight pico solar systems for powering small appliances, to solar home systems and full-scale mini-grids. In May 2018, EnDev arranged for the installation of solar panels at the town hall in Tesserela. EnDev worked in close collaboration with a local operator and local technicians, who installed ventilation in Tahirou's office and in the meeting room. The circulated air now makes the temperature more bearable – especially during weddings, when the meeting room fills up with guests. At night, the exterior of the town hall is illuminated, which makes the neighbours feel safer. Solar power also benefits the community's democratic processes: it is now easier for Tahirou and his colleagues to count votes during elections. Before, they had to count at night using the weak glow of a torch. With electric lights, they finished counting the votes of the 2018 presidential election hours earlier than before, submitting the results on time. Now, Tahirou's nickname is justified at last: sockets in his office let him charge his laptop and he can now work in his

office five days a week, providing an improved service for the commune. Soon, he will get a printer and a new, more powerful computer.

By the end of 2021, EnDev Mali had facilitated access to off-grid solar technologies for more than 38,000 people as well as more than 190 small and medium enterprises. Additionally, more than 260 social institutions now benefit from energy access and are thus strengthened in fulfilling their institutional role.

Learn more about current activities in Mali:
https://endev.info/countries/mali/

Solar power benefits the community's democratic processes: it is now easier for Tahirou and his colleagues to count votes during elections.

Mozambique

An innovative pairing brings light to Mozambique:

People in rural areas are using a new payment method to access renewable energy

In Mozambique, where less than 30 percent of the population is connected to the national grid, access to energy remains a major problem for millions and a serious obstacle to economic development. Although they have never met, Miguel Sottomayor, the managing director of an energy provider, and Dionísio Mahumana, a health counsellor, have something important in common: both men see solar power as the solution to this challenge.

Miguel Sottomayor manages *SolarWorks!*, a company that sells either basic solar kits of three lamps and one USB power output or a larger package of three lamps, sockets and TV. The company provides energy to 30,000 households in Mozambique. However, in a country where only every fifth person has a bank account, Miguel found that people were unable to pay for energy services. Supported by EnDev via an integrated development partnerships with the private sector (iDPP) and with technical advice e.g. for their client risk assessment tool, the company introduced a new, modern payment method: PayGo, or pay-as-you-go, which was the first of its kind in Mozambique when it launched a few years ago. With this scheme, payments are made through the customer's mobile phone operator and allow the customer to pay for the installation of solar systems in instalments. PayGo was almost as important as the light that customers received, but its introduction was not easy: *"To install the first PayGo in the country was arduous,"* Miguel recalls. *"It was an enormous challenge to introduce the system to people from rural areas who had never had electricity, and to explain to them in local dialects how the system works and what benefits the mobile payments would have for their everyday life."* But Miguel persisted and was rewarded for his tenacity. *SolarWorks!* has grown to employ 240 people and now operates in six out of eleven provinces in Mozambique.

One of his clients is Dionísio Mahumana. The health counsellor and his wife, Dona Cecília, used to live by the flickering light of candles. Since June 2019, Dionísio has been using a solar panel and could not be happier: *"Solar light has brought us out of the darkness. We pay only a third of what we paid before for candles, and the light is so much better. We can charge our phones at home and work at home to make extra cash."*

> “Our work will never end, but it is what drives us forward. Bringing light is a mission to bring the future to all people in Mozambique.”
>
> Miguel Sottomayor

Miguel Sottomayor knows that energy is still far from being available to the entire country: *“Our work will never end, but it is what drives us forward. Bringing light is a mission to bring the future to all people in Mozambique.”* EnDev and SolarWorks! also support the victims of Cyclone Idai that devastated Mozambique in early 2019 with access to solar energy.

Update 2022: PayGo has become an integral part of the solar sector in Mozambique with more and more companies offering this payment modality to their customers. EnDev continues supporting the market development e.g. through the Fundo de Acesso Sustentável às Energias Renováveis (FASER) following a Results-based Financing (RBF) approach.

Learn more about current activities in Mozambique:
https://endev.info/countries/mozambique/

Rwanda

Putting bread on the table, around-the-clock:

In Rwanda, millers and other entrepreneurs with access to solar energy are cutting costs and branching out

Rutenderi, in the east of Rwanda, about 150 km from the capital Kigali, is home to 4,000 people. The area is relatively flat and fertile, with bananas, maize, beans, and rice grown there. However, until recently, the people of Rutenderi could only rarely use electric equipment to process their crops, as the village was not connected to the national grid. Meanwhile, stand-alone systems with the capacity to power agricultural machinery were too expensive for rural populations. This was a challenge for millers such as Joseph Singirankabo. To power his mill in Rutenderi, Joseph used a diesel generator, but fuel was expensive and the generator would often break down, leaving Joseph's clients without flour.

This changed in 2019, when a solar mini-grid was installed in Rutenderi. The mini-grid serves over 500 households, 40 businesses and 10 social institutions, including Joseph's mill. Supported by EnDev, the mini-grid was developed on the basis of the National Electrification Plan, which allows companies to easily identify villages where the construction of mini-grids is permitted. It was set up by one of the private Rwandan companies that were supported by EnDev between 2014 and 2020 under the Village Grid Results-based Financing (RBF) programme. These mini-grid developers and operators received technical assistance as well as financial incentives to make mini-grid based rural electrification a viable business segment. Following the RBF approach, EnDev covered up to 70 percent of the companies' project costs in the form of incentives. Together, they built one hydro mini-grid, two solar mini-grids and 22 nano-grids. These mini-grids now bring reliable and affordable energy to over 10,000 people, who can light up their homes with clean energy, charge their phones, listen to the radio and watch television. In addition to households, the mini-grids connect more than 20 social institutions and over 350 businesses, like Joseph's mill.

Joseph's business has been transformed: the new electricity source is clean and makes power available around the clock, and Joseph's earnings have increased by about 20 percent.

At the same time, he does not have to buy diesel and now spends only a third on electricity of what he spent before. And it's not only Joseph who is feeling the benefits: a few months after the installation of the mini-grid, Joseph opened a bakery next to his mill, hiring new assistants and thus creating jobs. Since 2020, EnDev cooperates with *AVSI* to further develop the Productive Use of Energy (PUE). Around 15 existing and new entrepreneurs are selected in each of the 6 mini-grid sites. They are offered business skills training, business coaching and access to finance through a grant matching scheme. In the end, it is not only the entrepreneurs who benefit – entire communities and villages' population enjoy access to stable energy, businesses grow and the economy is boosted.

Learn more about current activities in Rwanda:
https://endev.info/countries/rwanda

Electricity around the clock: Joseph´s earnings have ancreased about 20 percent.

Senegal

“Solar technology at the heart of my life”:
A business woman successfully brings solar power to thousands of homes in Senegal

Yvonne Faye has much to be proud of: with a degree in electrical engineering and computer science, she has worked with solar technology throughout her career. In 2004, the mother of four founded her own company and ventured into the field of rural village electrification. In the context of a governmental concession model for operating mini-grids in remote areas, Yvonne saw her company’s opportunity. Today, she operates 20 mini-grids and employs about 30 people. More than 1,000 households and institutions in southern and central Senegal currently benefit from the service. Yvonne says: *“Solar technology has always been at the heart of my life, and my dream is for all villages in Senegal to be electrified and for Africa to become the leader in solar power.”*

EnDev shares Yvonne’s vision. Since 2007, it has been supporting five Senegalese companies as part of the government’s Rural Electrification Initiative, covering their initial investment in solar PV, diesel hybrid mini-grids and solar home systems. Meanwhile, the companies cover the costs for maintenance and equipment renewal.

> “... my dream is for all villages in Senegal to be electrified and for Africa to become the leader in solar power.”
>
> Yvonne Faye

Together, they now provide electricity to 275 villages in Senegal, which benefits over 68,000 people, as well as social infrastructure: 1,250 schools, health posts, youth centres and religious institutions are connected. The initiative has also enabled the Productive Use of Energy (PUE) in 550 small and medium enterprises, while the installation of public lighting provides safety to residents. Customers pay a monthly subscription fee for the services they receive.

Crucially, the initiative extends even further: EnDev will continue to support the operators by organising training on maintenance for local mini-grid guardians and technical assistants and by piloting technical innovations to make energy services more durable. In this way, the project makes a lasting contribution to Yvonne's vision of expanding solar power throughout Senegal.

Learn more about current activities in Senegal:
https://endev.info/countries/senegal

The initiative has enabled the Productive Use of Energy in 550 small and medium enterprises, while the installation of public lighting provides safety to residents.

Uganda

Solar power for Ugandan refugee settlements: Energy kiosks bring solar services and products closer to the communities

Malish Allen, 31 years old, has always had big dreams. Born in the Eastern equatorial region of South Sudan, Malish made a career as a civil servant. However, Malish's life changed in 2016 when he and his family fled the escalating violence and left home for Northern Uganda. Today, he lives in Ocea Village in the Rhino Camp Refugee Settlement in Arua District. Set on the sandy shores of the River Nile, Rhino Camp is home to 115,000 refugees. Nearly 25,000 Ugandan families live in surrounding villages. As Ocea Village is not connected to the national grid, residents were forced to travel almost 90 km along bumpy roads to the town of Arua for energy services and products. This gave Malish a life-changing idea: in 2017, he and seven friends founded the *Akita Mungu Fun and Friendship Association* and set up an energy kiosk. They hoped to provide phone charging services to their community. Unfortunately, the kiosk only had the capacity to charge 30 phones each day. As their solar device did not run effectively, their business suffered from regular blackouts. The business' daily income was less than the equivalent of seven euros.

But Malish eventually found a solution: supported by EnDev Uganda, *Akita Mungu Fun and Friendship Association* moved to a new and spacious energy kiosk with a high-quality solar system to power many more devices. Besides phone charging and secretarial services, the young entrepreneurs introduced rechargeable batteries to reduce e-waste and help households to save money. They started expanding their product portfolio to include high-quality solar lanterns and Pico PV systems and also improved cookstoves. Solar products enable children to study and adults to work in the evenings. Through on-the-job training facilitated by EnDev, the friends and business partners learned more about record keeping and marketing, after-sales services, basic repairs and maintaining devices. With the capacity to charge up to 500 phones daily, and the sales of other energy services and products, the new kiosk now generates the equivalent of about 200 euros in daily sales – sufficient for re-stocking, investments, and most importantly an income for the entrepreneurs and their families. Malish explains with his broad smile: *"We have now expanded our services even more by selling stationery items to schools, offering printing, laminating, and photo studio services. We hope to offer our services to more people with the knowledge, products, and support we have received."*

> “We have now expanded our services even more by selling stationery items to schools, offering printing, laminating, and photo studio services.”
>
> Malish Allen

In 2017 and 2018, EnDev supported two energy kiosks and 60 micro-entrepreneurs to supply kiosks in two refugee settlements. They all received initial support for the set-up of their businesses and are now earning a living by selling energy products and providing energy services to around 5,000 people. EnDev continues to support the kiosk and additional entrepreneurs in the remote refugee settlements to provide much-needed energy services and products. The energy kiosk business model in the context of forced migration and displacement has proven to be successful in improving livelihoods and supporting economic empowerment, offering employment opportunities, and bringing energy services closer to the community. This has gained the attention of humanitarian actors, as well as potential investors and donors. EnDev Uganda, together with the local entrepreneurs, is providing practical insights to promote the model in other locations.

Learn more about current activities in Uganda:
https://endev.info/countries/uganda/

Bangladesh

Bondhu Chula – a stove that changes more than the way of cooking:

In Bangladesh, millions of improved cookstoves have a positive impact on income and health

55-year old Jamal Uddin has had a passion for food his entire working life. Even back in the Bangladesh Army, where he served for 25 years, Jamal worked in the kitchen. In 2014, he left the army and opened his own restaurant in Nabinagar, a short distance from Bangladesh's capital. The area's 50,000 inhabitants work in small businesses and garment factories. Jamal works from early in the morning until late at night so that his restaurant Bismallah can meet the demands of his hungry guests. However, he still found it hard to save enough money to provide his family with a good living and his four daughters with a decent education. One of his main expenses was for fuel: he spent the equivalent of 15 euros per day on gas cylinders. Jamal also used two traditional biomass cookstoves, an inefficient cooking method, which produced large amounts of smoke and was a health hazard for his employees.

In 2018, Jamal made some changes that would have a big impact on his business. He learned about improved cookstoves and replaced his older cookstoves with two Bondhu Chulas – a Bengali term meaning "friendly stove". The improved cookstoves operate by burning biomass more efficiently, saving firewood and money. Studies show that 95 percent of its users report significantly less smoke in their homes, leading to an improved health of the residents, with fewer eye infections and respiratory diseases. With EnDev's support, more than 2.6 million improved stoves have been sold in Bangladesh between 2005 and 2019. Improved cookstoves are marketed and sold by more than 5,000 local enterprises. EnDev Bangladesh organises trainings for these enterprises and offers financial schemes to make the production and sale of stoves more attractive.

With his two Bondhu Chulas, Jamal started to cut costs: While his traditional stoves needed 95 kilogrammes of wood each day, the Bondhu Chulas only required 55 kilogrammes. But it was by minimising the use of his gas stove that he saved the most money. Before, he would go through two LPG cylinders per day, frying and cooking food for his restaurant. Now, he only uses gas to cook small fish and one cylinder lasts three days.

Having paid the equivalent of 180 euros for both Bondhu Chulas – the stoves paid for themselves within a month. He explains: “With my Bondhu Chula stoves, I am able to save money and grow my business as a result. I opened two new food shops, hired people and serve more customers. I feel good about the fact that I am not only saving fuel, but also have a clean cooking environment.

Previously, I used to get complaints about the smoke, but now there is less pollution and my customers and employees are happy.”

Learn more about current activities in Bangladesh:
https://endev.info/countries/bangladesh/

> “Previously, I used to get complaints about the smoke, but now there is less pollution and my customers and employees are happy.”
>
> Jamal Uddin

Cambodia

Bringing higher-tier cookstoves into the Cambodian market: How international manufacturers benefit from regional market development

Bich Tan Nguyen is the owner of *SolarServe*, a company manufacturing cookstoves on the outskirts of the city Da Nang in Northern Vietnam. Located between warehouses and factory buildings, Bich's small production facility houses half a dozen workers. Using hand-tools and simple machinery they cut, drill and roll sheet metal into what will become the body of a super-clean gasifier cookstove. Another worker packs finished cookstoves into cardboard boxes covered with Vietnamese and English writing that announce the benefits of the stoves: "Saves Energy – Protects Environment – Saves Fuel Costs".

An old hand in the cookstoves business, Bich's sales have, however, been limited to his home town of Da Nang and the surrounding areas. This changed in 2015 when EnDev introduced a project to increase the availability of clean cooking devices in the Mekong region – Vietnam, Laos and Cambodia. With a virtually untapped demand for advanced biomass cookstoves in Cambodia, and a lack of local suppliers to meet demand, EnDev offered support for regional and international stove producers to expand their business in this emerging market. Aware that his product from Vietnam was more advanced than those available in Cambodia – where more than 90% of households still use traditional wood- and charcoal stoves – Bich was keen to test his product in the Cambodian market.

Between 2015 and 2018, EnDev provided technical and financial support to manufacturers of higher-tier cookstoves from all over the world with the purpose to let their market expand to Cambodia. Results-based Financing (RBF), providing a cash incentive upon sales, supported business to become active in Cambodia, thereby introducing technological innovation and establishing a local industry for better stove products. The project created a trading platform: international stove producers could meet and form business relationships with local Cambodian companies that could buy the stoves and sell them to households in rural areas.

Together with other international manufacturers, Bich seized upon this opportunity and began shipping his stoves to Cambodia. These were taken up by sixteen local distributors that participated in EnDev's trading platform. Doing business in a foreign country for the first time, and being new to cross-border trade, Bich faced no shortage of hurdles. In the end, all of this work has been more

than worthwhile. In Bich's words: *"It is a very good project for me to test the market in Cambodia. I really see market potential there and I actually learned a lot through this project – how to deal with exports, customs, transport. It helped to make us a stronger, more mature company. We are now a truly international company - and we want to export to Myanmar and other countries - because now we know how to expand."*

And it's not only Bich who benefitted: more than 40,000 higher-tier cookstoves, with high fuel efficiency and low smoke emissions, had been sold in the Mekong region, giving local communities access to a new generation of cleaner cooking devices. But most importantly, with several market actors working to set-up local production of the new stoves, the project has enabled a new industry to develop in Cambodia. This has remained, after the project ended, continuing to provide families with access to clean cooking.

Learn more about current activities in Cambodia: https://endev.info/countries/cambodia/

> "I really see market potential there and I actually learned a lot through this project – how to deal with exports, customs, transport."
>
> Bich Tan Nguyen

Indonesia

The dream of *BIO* in every village: Tens of thousands of Indonesians benefit from renewable energy through biogas

Suyono lives with his wife and their three children in Minggir, a small village 500 km from Indonesia's capital, Jakarta. With fertile soil and a favourable climate, most of the 240 households in Minggir grow rice and crops, as well as breeding cows, sheep, chicken and ducks. While the villagers are happy with most of the local infrastructure, such as roads and the water network, access to energy remains a problem. When it comes to cooking and lighting, households usually use petroleum gas andfirewood – which harm the environment and people's health. In 2016, Suyono, a mason by trade, heard about a more environmentally friendly energy source: biodigesters convert organic waste into biogas, which can be used for cooking and lighting. But energy isn't the only product of biodigesters: a by-product of biogas production, bioslurry, is a form of waste with several benefits. It is an excellent soil conditioner, adds humus (a valuable constituent of soils), and enhances the soil's capacity to retain water. Proper application has been proven to provide higher crop yields than regular manure. It retains all nutrients originally present in the feeding material, which makes it a potent organic fertilizer and food for animals. Bioslurry provides a viable solution to nutrient depletion of many agricultural soils and can boost agricultural and horticultural production.

Suyono started using biodigesters and applying bioslurry as a fertilizer on his rice plantation, which resulted in harvests of 1,400 kg per year instead of 1,200 kg. His vegetables also look fresher and grow faster. Since using bioslurry, Suyono earns 15 percent more money, some of which he can save as he doesn't need to buy chemical fertilizers anymore. Suyono was so impressed by the biodigesters that he decided to become involved in the sector. EnDev Indonesia offered training in biogas installation, bioslurry, stove-modification, small-scale digesters, as well as business and financial management. In 2017 Suyono founded his own business after participating in the training. He started constructing and repairing biogas digesters. Two years later, and together with 10 other masons, he had already constructed 250 biogas digesters in the province of Yogyakarta alone. He was part of a larger development of the market for this technology: between 2013 and 2018, EnDev promoted biogas digesters as an affordable and sustainable energy source in Indonesia and supported 87 companies. These have installed roughly 10,000 biogisters in 10 provinces, ensuring that more than 35,500 people now have access to energy.

As one of the most successful biogas entrepreneurs working with EnDev in Indonesia, Suyono has taken the environmentally friendly biodigesters into schools, universities, municipal offices and local companies. According to Suyono: *“Biogas technology has profoundly changed my life – from a regular mason to an expert and an entrepreneur – and has improved the quality of life for many.”* Entire communities are now able to generate their own energy, produce bioslurry and benefit from this natural fertilizer. Step-by-step, Suyono is getting closer to his dream of self-reliant villages with a biogas digester in every home.

EnDev was operational in Indonesia for a full decade from 2009 to 2019 and has been able to improve the lives of thousands.

Suyono started using biodigesters and applying bioslurry as a fertilizer on his rice plantation, which resulted in harvests of 1,400 kg per year instead of 1,200 kg.

Nepal

Shared solutions for renewable energy:

A decade of technical assistance and a revolving fund has realized micro hydro power plants for a growing number of Nepalese communitie through biogas

Some 300 kilometres from Kathmandu, unpaved roads lead through hills and fields to the small village of Jalapa. Jalapa is home to Sanad Rai, 45, and his family of four. Most people here live from smallholder farming and cattle and poultry farming. Up to 2012, they used kerosene and firewood for light and cooking. To get kerosene, they had to walk six hours to the nearest city and pay around 100 Nepalese Rupees, the equivalent of 0.80 euros, for a litre. Firewood was easier to get but had bad effects on the family's health: *"Especially my wife and children suffered because they spent many hours at home and were exposed to the smoke"*, says Sanad. He could not bear this any longer: together with other community members, Sanad decided to switch to modern energy. The process started with a feasibility study, conducted by the Alternative Energy Promotion Centre (AEPC). AEPC submits report and financial breakdown to a review committee, which includes technical experts, banks and the government. After their approval, bidding was opened to private companies to install a micro hydro power plant in the nearby river *Lumju Khola* to generate electricity. AEPC helped to apply for a community loan through the *Micro Hydro Debt Fund* – a revolving fund that is used by rural communities that are unable to finance the construction of a hydro plant themselves. Additionally, the community received technical and financial support from AEPC and EnDev, for example through construction supervision, documentation and trainings for plant operators and user committees.

Jalapa was not the only village receiving support for their renewable energy project. Until 2021, EnDev Nepal has supported 30 rural communities to get access to electricity via hydro power through the *Micro Hydro Debt Fund*. In addition to financial support through the fund and capacity building for the communities and operators, the project also creates linkages to the private sector

and develops capacities within the AEPC and commercial banks.

In Jalapa, the *Lumju Khola Micro Hydro Plant* started operation in 2012 and has now provided energy to 195 households for a decade. Estimated cumulative savings of kerosene and firewood add up to an equivalent of 26 EUR per year. The cumulative GHG emission reduction is 51 tons of CO_{2e}. With the expected remaining lifetime of the hydro plant until at least 2032, these impacts are expected to double Sanad recognises the importance of electricity for the use of new technologies: *"We have now improved our water pumps, and agricultural processing and storage facilities. I use less firewood and spend a lot less money than I used to when buying kerosene. We are healthier because we no longer have to live in smoky homes."*

People use electricity for light and cooking, to go online and watch the news on television. All this creates a feeling of empowerment. The members of local women's groups support each other in using the new opportunities to find employment, resulting in greater independence. And Sanad is happy for his children, that benefit from an improved quality of education and learning materials, since the community established a computer institute at the local school.

Learn more about current activities in Nepal:
https://endev.info/countries/nepal/

The Micro Hydro Plant has provided energy to 195 households for a decade. Estimated cumulative savings of kerosene and firewood add up to an equivalent of 26 EUR per year. The cumulative GHG emission reduction is 51 tons of CO2e.

Vietnam

Transforming waste into energy: Biodigesters produce renewable energy for Vietnam's farming communities

Thirty kilometres north of central Hanoi lies Soc Son. Most households in this district grow rice and raise livestock, providing the capital's residents with food. With little space between the household farms, people live alongside their animals, and the smell of pig manure hangs in the air. Hoang Van Khang's biodigesters are a welcome innovation: biodigesters convert organic waste into biogas, which can be used for cooking, while the slurry – or fermented manure – serves as an organic fertilizer to increase crop yields. This reduces farmyard odours and saves money that would otherwise be spent on cooking fuel and chemical fertilizer. Furthermore, it reduces soil and water pollution, deforestation, and greenhouse gas emissions. Each digester saves around six tonnes of carbon dioxide equivalents per year – about the same level of emissions as would be produced by one person flying from Germany to Vietnam and back again, or driving a car for 20,000 km.

With 15 years' experience in the biogas sector, Hoang knows this technology inside and out. He has built and sold biodigesters since 2004. For the first 10 years though, Hoang didn't make much headway in the biogas market. That changed in 2013, when EnDev launched its Results-based Financing (RBF) project in Vietnam. RBF helps businesses develop by providing financial incentives for certain activities, such as sales. Almost 200 companies in more than half of Vietnam's provinces participated in the RBF project. While they bore the initial investment and performance risks, the financial incentives allowed them to be flexible and innovative in business planning, marketing and sales. Companies started to work more independently and sales increased. Thanks to their enhanced capacities to operate their companies, they spearhead the development of the biogas market with considerably less outside support. Together, the 200 participating companies have sold more than 41,000 biodigesters between 2013 and 2018.

For Hoang's company, RBF was the extra push it needed: with additional money coming in, Hoang was able to grow his business from three to 30 staff members and expand into markets beyond his hometown. Hoang sold more than 1,000 digesters between 2016 and 2018 alone. He is proud of his impact on the community, which can now generate its own renewable energy, contributing to a greener lifestyle and lower pollution. Nguyen Thi Que, a biogas user in Soc Son explains: *"The biodigester has helped me and my family a lot. Now I use biogas for daily cooking instead of liquefied petroleum gas. It saves the equivalent of 3.75 euro per month. I'm very satisfied with it. I also share the surplus biogas with our neighbours."*

> “The biodigester has helped me and my family a lot. Now I use biogas for daily cooking instead of liquefied petroleum gas.”
>
> Hoang Van Khang

Sharing surplus biogas with villagers nearby means that digester owners are able to make full use of their biogas, reducing their communities’ greenhouse gas emissions and protecting the environment. It also contributes to the socio-economic development of Vietnam’s rural areas. EnDev also introduced an Innovations Fund that Hoang Van Khang participated in to develop an innovative gas piping system for large biodigester installations to share the gas among neighbours. He now sells gas combined with biogas appliances for multiple households. He’s also pursuing new ventures and builds more biodigesters for large pig farms. These biodigesters are ten times larger than household-size biodigesters and designed to cater for larger livestock herds. Nguyen Van Bien from Soc Son has invested in one and says: *“I installed a biodigester for my pig farm last year. We couldn’t even use the full amount of biogas that it produced. We had to burn gas every day, which is wasteful. Now, thanks to the new biogas minigrid, we can share the surplus biogas through pipes with our three neighbours. That feels great.”*

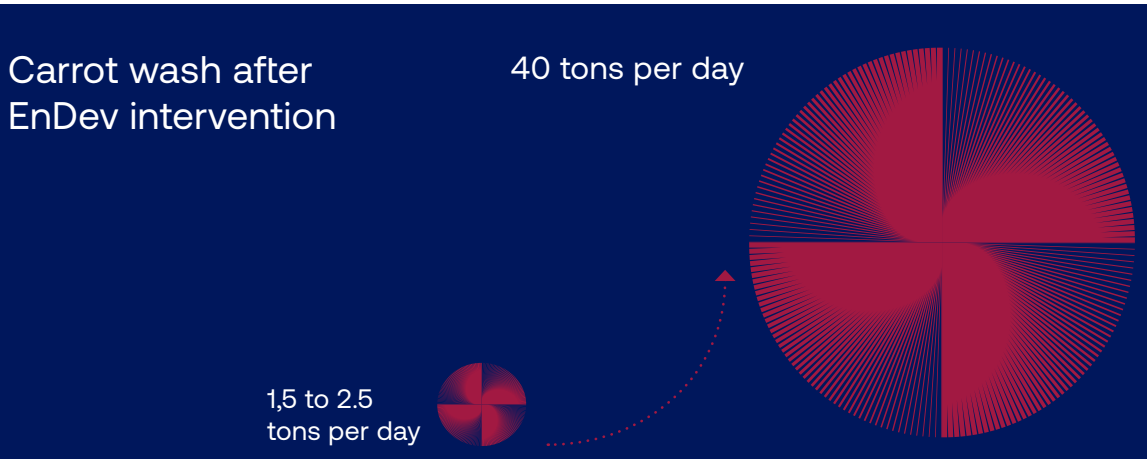
EnDev supported access to modern energy in Vietnam until 2020.

Bolivia

From washing carrots to growing communities:
How a carrot-washing machine has led to benefits for more than 100 families in Bolivia

Julio Helguero is cheerful and one of life's optimists. He doesn't stop smiling, not even when he recalls the countless mornings he spent wading through icy waters in the past. On the plateau of the Bolivian capital La Paz, the farmer used to spend hours in rivers, washing carrots by stepping on them. Using this method, two people could wash between 1,5 to 2.5 tons of carrots per day. "It was exhausting, it felt like long-distance running", he explains. So Julio designed a machine that would make washing carrots easier and bring prosperity to the small farming community of Mantecani, and others.

But it wasn't as easy as he had imagined: At first, the huge carrot-washing machine was powered via a household connection to the national grid. This meant that the machine overheated easily, damaging its engines. Julio, by then the president of Mantecani's farming association, went in search of solutions.



> “Not only does this mean that people don’t have to clean carrots manually in ice cold water, it also saves time.”
>
> Julio Helguero

Through the municipality, he made contact with EnDev Bolivia. EnDev provided technical support to ensure that technical specifications were correct and the machine could be used safely. Additionally, EnDev carried around two thirds of the investment costs for a much needed voltage transformer. Having installed the transformer and electricity meter, the machine now washes an average of 40 tons per day. Julio explains: “The machine works perfectly 24 hours a day. Not only does this mean that people don’t have to clean carrots manually in ice cold water, it also saves time: Instead of four hours, the carrot wash now takes just 30 minutes for a single load. People can use the time to grow and harvest other vegetables – and still take their washed carrots to the market.”

News of the larger scale machinery quickly spread beyond Mantecani. The result? Since 2012, small and medium-sized enterprises have replicated this idea country-wide thus contributing to the Productive Use of Energy (PUE). EnDev Bolivia provides training, financial assistance, economic incentives, and connects technology providers with trade associations and entrepreneurs. Between 2009 and 2019, EnDev Bolivia supported the introduction of 2,2000 productive use technologies such as water pumps, milking machines and cooling tanks, or grain mills.

Learn more about current activities in Bolivia:
https://endev.info/countries/bolivia/

Honduras

A community takes matters into its own hands:
Reviving old plans for a hydro power plant in Honduras pays off

In the rugged region of Lempira in Western Honduras, the communities of Las Dantas, Los Chiles and Playitas are connected by dirt roads that stretch across a mountainous landscape. The region is home to about 150 families and a population of roughly 800 people, who are represented by a committed leader: María Esperanza Cortés, aged 55. For years, María has fought to improve families' living standards, including access to electricity. Until 2018, the communities relied on oil and gas lamps and firewood as sources of energy, which meant that they were not able to use basic kitchen appliances for food storage and cooking.

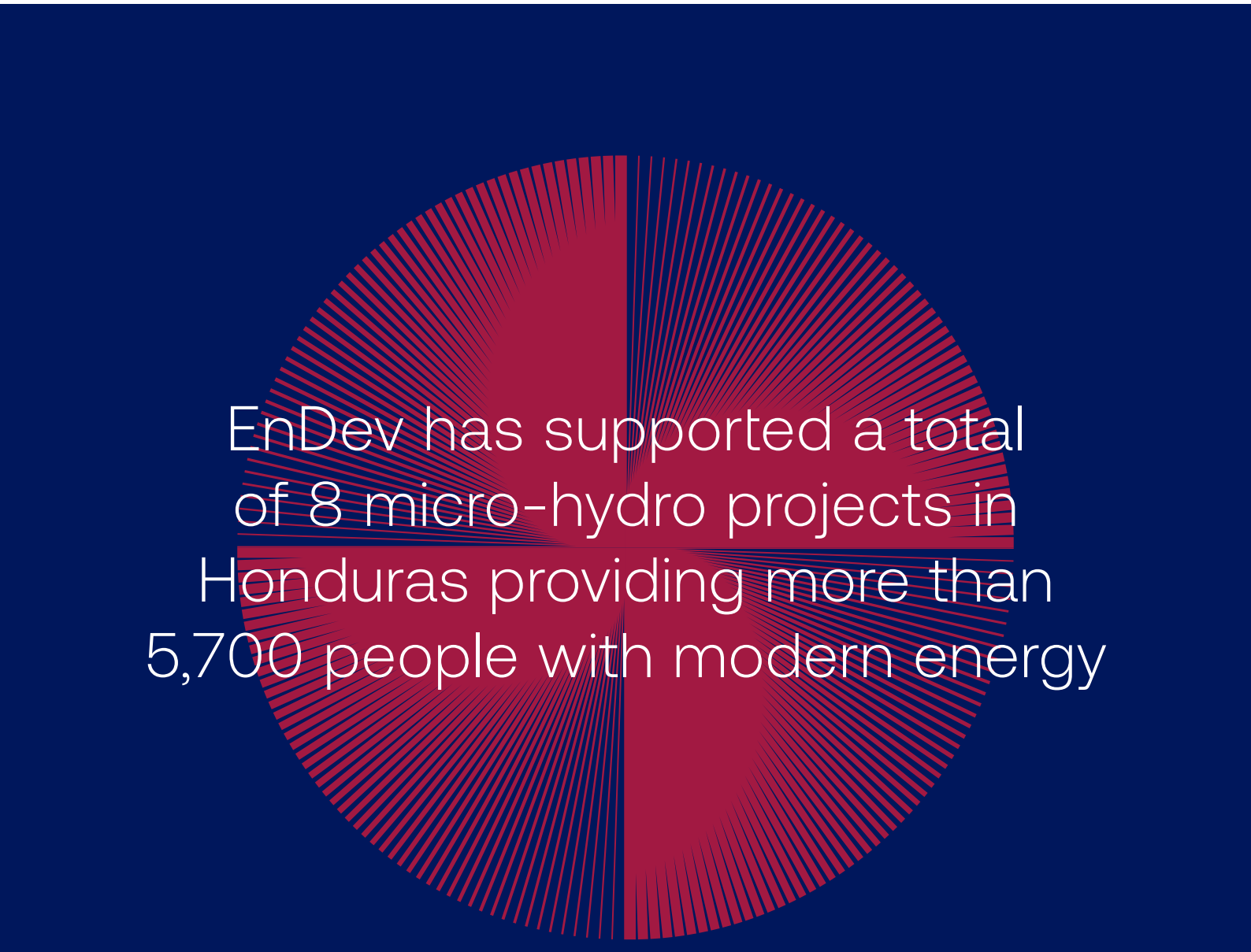
María recognised the importance of energy access for economic and social development. With this in mind, she worked tirelessly to realize a hydroelectric power plant for the communities– 15 years after it was originally designed by the government owned company ENEE., Unfortunately, the project development had to be halted due to lack of funding. In 2016, EnDev Honduras pledged to provide technical assistance to reinitiate the project. Taking the available budget into account adjustments were made to the technical design of the power plant, all involved stakeholders brought together and key equipment transported to the site, which had been in storage by the ENEE. But this was only half of the story: apart from construction and overcoming budget limitations, somebody had to resume responsibility

for operation. In a community assembly, the three communities decided to organize themselves and started their own cooperative COMISERICLAL. It manages the day-to-day operation and maintenance of the plant. Supported by the National Electric Energy Company, and municipal and central governments, the Río Claro Hydroelectric Plant opened in December 2018.

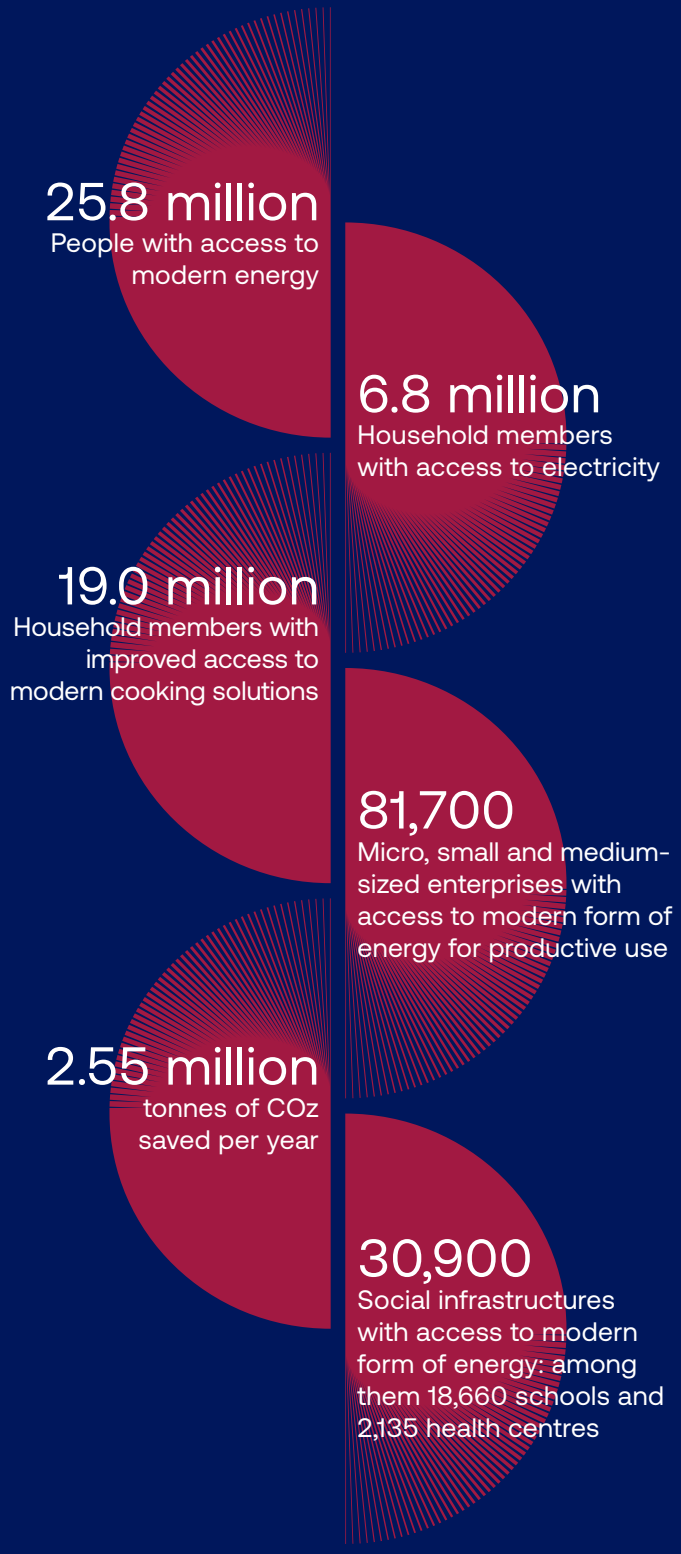
In Lempira, life became much easier for the 800 people – as well as for the community's six social institutions and three enterprises. María explains: "People can now refrigerate their food, so that it lasts longer. We have stoves, coffee makers and microwaves and can use these appliances whenever we want." COMISERICLAL charges users a monthly fee to cover its running costs; energy has become reliable and energy costs have been halved. Turning a community-led project into reality has also empowered the villages and given them a sense of achievement, paving the way for future community developments. Together with EnDev, María will continue shaping the young people of her community into future leaders who will one day sustain and manage the hydroelectric plant.

The idea of accessing electricity generated by hydro power plants was born from within the community. However, this project was not the only one that was shaped by the extraordinarily high levels of ownership, solidarity and perseverance of the Honduran rural population: EnDev has supported a total of 8 micro-hydro projects in Honduras providing more than 5,700 people with modern energy.

EnDev supported modern access to energy in Central America (Honduras, Nicaragua and to a lesser extent Guatemala) from 2006 to 2019.



EnDev at a glance



Around 4 billion people have no access to electricity or modern cooking technologies. This has a dramatic impact on quality of life, environment, health, education and income opportunities. EnDev's involvement focuses on providing access to modern, renewable energy. This is a pivotal factor in strengthening socio-economic development and combatting climate change.

EnDev's drive is to improve the lives of the most vulnerable people, ensuring no one is left behind. Economic opportunities and green jobs are created by building markets for modern, renewable energy. EnDev contributes to reducing greenhouse gas emissions to protect our planet's climate. Its approach is to empower structural, selfsustaining change; kickstarting market and sector development that evolves further without support by EnDev.

EnDev's work is about people. Results are monitored and reported rigorously. EnDev's achievements on helping people, schools, health centres, and companies gain access to electricity or improved cooking technologies can be found in this report. This report also presents EnDev's impacts on gender, job creation, and reduced carbon emissions.

EnDev is a strategic partnership. Dedicated donors, partners and individuals work together to support social development and economic growth by providing access to modern, renewable energy in more than 20 countries around the globe. The driving force behind EnDev is the partnership of Germany, the Netherlands, Norway, and Switzerland; donors who are committed to accelerating energy access and socio-economic development.

*Achievements until December 2021

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