EnDev: Powering change through electrification

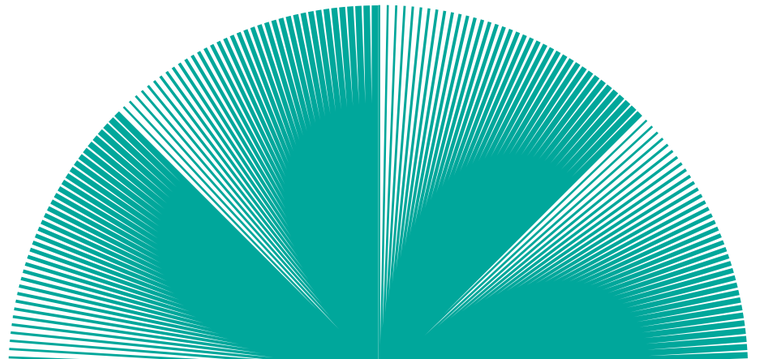
Lessons and insights from 20 years of implementation

endev 20 years

20 years

ACRONYMS AND ABBREVIATIONS

CO2	Carbondioxide
COVID	COVID-19 (Coronavirus Disease 2019)
DSS	Demand-Side Subsidies
EnDev	Energising Development
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPS	Global Positioning System
LNOB	Leaving No One Behind
M&E	Monitoring & Evaluation
MSMEs	Micro-, Small and Medium-sized Enterprises
RBF	Results-based Financing
RVO	Rijksdienst voor Ondernemend Nederland
SDG	Sustainable Development Goal
SDG 7	Goal 7 of the Sustainable Development Goals (Affordable and Clean Energy)
SEforALL	Sustainable Energy for All
SHS	Solar Home System(s)



FOREWORD

Dear Readers,

What began as a partnership between Germany and the Netherlands has grown into one of the largest energy access programmes worldwide. Today, EnDev is a multi-donor partnership that has enabled nearly 34 million people to gain sustainable access to modern energy services — including **7 million who now have access to electricity**.

Looking back on 20 years, what stands out to me is not only the scale of what has been achieved, but the spirit of cooperation coupled with a very clear target orientation and efficiency focus. Reaching 7 million people with electrification has required us to adapt continuously. We scale what works, rethink what does not, and stay close to the realities on the ground. We have learned that sustainable impact at scale depends on functioning markets. Public programmes can initiate change, but lasting transformation happens when private actors invest and when policies and institutions create space for innovation. Strong partnerships have been indispensable. And we have come to understand that access alone is not enough: electrification changes lives only when electricity is used productively to create income, strengthen services, or empower livelihoods.

For me, EnDev's 20th anniversary is therefore not only a moment of reflection, but a moment of responsibility. **How can we use what we have learned and our experience to reach even more people** with sustainable energy, and access to electricity in particular?

Too often, access to electricity is only measured in connections and megawatts. Yet, its true value lies in the opportunities it creates and the lives it improves.

– Alexander Haack
Programme Director EnDev

This report is part of that effort. **It brings together two decades of implementation experience, highlighting what has worked, where we have had to adapt, and where challenges remain**. The insights presented here are not ours alone. They are shaped by conversations with partners, implementers, and long-standing companions of the programme, and grounded in work across more than 20 countries.

Above all, they are reflected in the stories of people whose lives have changed through access to electricity. These stories remind me why EnDev's work matters. **Electrification is not about infrastructure or technology alone**. It is about whether a child can study after sunset, whether a health centre can store vaccines safely, or whether a small enterprise can grow beyond subsistence. Too often, access to electricity is only measured in connections and megawatts. Yet, its true value lies in the opportunities it creates and the lives it improves.

It is this human impact that gives meaning to the global figures. And despite the progress made, hundreds of millions still live without access. **Achieving Sustainable Development Goal 7 will require scalable, inclusive solutions and sustained collaboration.**

After 20 years of energising change, I remain convinced of one thing: electrification succeeds when we keep people at the centre, enable markets to grow, and build partnerships that endure. **I invite you to build on these lessons with us** — so that together, we can reach many more people in the years ahead.

Alexander Haack
Programme Director EnDev

Video Why energy access matters?
Watch our 20 years anniversary video.

Web EnDev 20 years anniversary
The lessons in this publication are informed by best practices and human impact stories from 20 years of implementation. Visit our 20 years anniversary page to learn more.

INTRODUCTION

Plugging in, powering up, scaling up

EnDev has worked for 20 years to make sure everyone can be part of a bright electric future – including the 7.8 million people who have gained access to electricity through the programme's initiatives.

Using affordable and reliable electricity from renewable sources, these millions of people have improved their quality of life, educational and income opportunities, and connections to the wider world. They are part of self-sustaining changes in the energy sector that EnDev has catalysed in 26 countries over the years. While achieving those changes, EnDev has built up enormous momentum in pro-poor markets for renewable energy services – and generated essential learning for all actors pursuing these same goals.

EnDev launched in 2005 as a broad strategic partnership to increase access to modern renewable energy, both for electrification and clean cooking. In 32 countries, donors including the governments of Germany, the Netherlands, Norway, Switzerland, and the United Kingdom enabled two principal implementers, Germany's GIZ and the Netherlands' RVO, to kickstart electrification and clean cooking markets.

32 countries

EnDev was active in

When these partners began their work, the global electrification picture was not good: more than 2 billion people in the world lacked any access to electricity. In many countries, power grids were designed around cities. In rural areas off-grid or mini-grid solutions often relied on diesel generators, as renewable energy technologies like solar and small-scale hydropower were still expensive. The world's governments had not yet set their sights on a global goal to achieve universal electricity access[2]. Nevertheless, EnDev lit a spark.

EnDev has always oriented its progress toward a simple outcome: more people gaining access to modern energy services. It started out with a target of 3.1 million people by 2009, combining electrification and clean cooking results. The programme exceeded this by far, and has since reached more than 10 times that number. Along the way, governments set their own targets for energy when they committed to the Sustainable Development Goals (SDGs) in 2015. Of these global goals, SDG 7 enshrined a shared global ambition to ensure access to affordable, reliable, sustainable, and modern energy for all by 2030. The first indicator for SDG 7 achievement was the proportion of population with access to electricity[1] – illuminating the path EnDev was already forging on three continents.

Achievements in electrification

7.8 million people
have gained access to electrical energy services.

66,520 MSMEs
have harnessed electrical energy for productive use in their operations.

14,310 social institutions
have been electrified.

*All figures are by end of 2024

[1] UNDP World Energy Assessment 2004
[2] Although none of the eight Millennium Development Goals (2000–2015) specifically addressed energy, access to sustainable and clean energy was important for progress on all the goals, and this was acknowledged in key documents such as the 2010 General Assembly resolution "Keeping the Promise: United to Achieve the Millennium Development Goals"

> **To have this really high credibility with transparent monitoring was a huge success factor, because countries and institutions knew their money was well spent – if you gave it to EnDev it would bring something.**
>
> – Jörg Michael Baur, first Programme Manager of EnDev, GIZ

The many faces of progress

More than just an exceptionally long-running programme, this has been a collective journey. EnDev has worked in constant strategic partnerships with governments, the private sector, and international initiatives to pursue electrification goals in 26 countries, while in another six countries their work focused solely on clean cooking energy. Together EnDev and its partners have successfully advanced electrification markets, along with solutions to use electricity for social development and economic growth. Such progress could take many forms. At times, progress was supporting markets for solar home systems (SHS) and appliances; at others, enabling community-scale solar and hydropower mini-grids. It could be electrifying health centres and schools, and it could be working with small enterprises to put new energy sources to productive use.

This report is an attempt to share not just the success, but the 20-year learning process behind EnDev's electrification efforts. It combines interviews with implementers and partners, past and present, with examples from many countries to illustrate the significant and positive changes that come with successful electrification.

Infobox | Solar home systems (SHS) and mini-grids

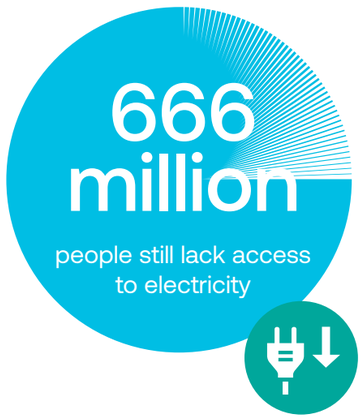
An SHS is a photovoltaic system that meets needs of a single household, or sometimes a small business. Most often, an SHS consists of a solar panel, a battery, cables, and usage points like lamps and outlets. Some kits come with efficient appliances such as radios and televisions.

In contrast, a mini-grid is a system that generates electricity (using any energy source and technology) for a localised group of customers. A mini-grid can operate in isolation from the national grid, although in some cases they may interconnect.

> When you have a good idea on country level, it is that idea that predominates. Ideas are generated from the bottom up, and that allows EnDev to take up some really interesting opportunities that are based on local needs and realities.
>
> – Caspar Priesemann, Energy Advisor, GIZ

Onward to universal access

Historic progress has been made, but 666 million people still live without electricity[3]. Progress toward the SDG 7 vision of clean, accessible energy for all can't be taken for granted. Yet EnDev and its partners know more than ever about how to get there. EnDev has made enormous worldwide headway on its own closely-monitored access target, and much more action lies beyond this simple number. The next leap has been to couple renewable energy with other sectors, such as irrigation, agro-processing solutions, electric cooking, and electric transport. These connections bridge energy, climate, and poverty reduction goals. They will enable countries to leapfrog over polluting forms of energy and build inclusive and interconnected energy systems. The single ambitious goal of increasing electrification has sparked developments in many associated applications. A complete clean energy vision has thus come into focus.



Bangladesh | First steps for solar households in 2006

Within EnDev's first year, the Bangladesh team could already report directly delivering more than 25,000 SHS to rural households and businesses. This enabled an early study on the impacts of solar electricity. With electric lighting schoolchildren could study 20% longer, while other household members found it more convenient and safer to move around and gather socially at night. Televisions improved access to educational, news, health, and agricultural programming. More people could adopt and charge the newly popular mobile phones. In bazaars, shopkeepers reported more customers and revenue, improved lighting, TVs, and radios encouraging customers to linger over tea and snacks.

Read more

The six sections of this report explore the major points of learning from EnDev's long story. Section 1 begins by showing how the collaborative **partnership structure** of EnDev set it up for enduring success from year one. Section 2 shares lessons about implementing a **market-based approach** in the electrification sector, without leaving anyone behind. Section 3 looks at the importance of the **access tier** framework in a time of advancing energy technologies. Section 4 examines the role of **productive use** of electricity and the host of local ideas that EnDev supports. Section 5 honours the **monitoring effort** that has always been the engine behind EnDev's outcome orientation. And section 6 looks to a new horizon of **electric cooking**, which unites the two components of EnDev and connects this publication with its companion report, **Lessons from 20 years of clean cooking**.

[3] Tracking SDG7: The Energy Progress Report, 2023 data

> EnDev offered the first systematic approach that I saw working through an ambitious outcome target on energy access, and it has become incredibly influential. Consider Mission 300: the President of the World Bank and the President of the African Development Bank have jointly said we are going to provide electricity to 300 million people by 2030. So much has been accomplished since we started in 2005.
>
> – Frank van der Vleuten, former EnDev Board Member, Ministry of Foreign Affairs of the Netherlands

LESSON 1

Electrification progress is most sustainable with diverse national and local collaborators – and also multiple implementers and donors

EnDev has supported millions of people to gain and keep access to electricity, but not alone. Because sustaining the outcomes and growth of its approaches have always been central goals, EnDev has sought to involve every possible actor and stakeholder since the beginning.

Real electrification progress builds ownership, markets, and capacities at every level. EnDev has always engaged with public actors like ministries and rural electrification agencies to ensure activities contribute to national sector targets, strategies and policies. The long-term engagement of GIZ and other core EnDev implementers in each country has been a key asset for building these trusting relationships. Over the years, EnDev has intensified its collaboration with governments on energy policy to strengthen the enabling environment for energy access markets.

EnDev has distinguished itself from other programmes in Senegal with its technological innovation; support, advice, and training for project leaders in income-generating activities; and access to green financing. The partnership between EnDev and ASER has reached the best outcomes through a combination of technologies and value chains, capacity building for stakeholders, project subsidy mechanisms, and gender mainstreaming in rural electrification.

– Alfred Dieng, Project Director, Senegalese Rural Electrification Agency

While governments are essential for ensuring a stable enabling environment and long-term sustainability, EnDev's market-based approach would not have been possible without close partnerships with the private sector. Strong companies – from village micro-enterprises to larger solar technology distributors – are the foundation of functioning markets in every country. Signature approaches like Results-based Financing (RBF), capacity building, and demand-side work help private partners grow, and if well designed, encourage them to expand into underserved markets where electrification can have the greatest impact. This is the heart of a sustainable outcome: a household that has gained access to electricity through a market actor who is there to stay.

Infobox | Results-based Financing (RBF)

RBF is typically used to overcome market barriers. Under an RBF arrangement, EnDev releases funds (incentives) to an energy supplier when certain agreed-upon conditions and results are reached and independently verified. This may, for example, be a specified number of people gaining access to a certain type of technology. Energy suppliers are free to decide how best to achieve these results, thereby encouraging innovation and competition. EnDev has deployed more than 70 RBF mechanisms since 2013, with more than 40 focusing on electrification.

Read more

Find the partners – everywhere

EnDev's partnership model goes beyond public agencies and private companies. Diversity of partners is a strength in itself, and EnDev has been capitalising on this strength to accelerate energy access. As such, EnDev also works with civil society organisations, cooperatives, and community groups; it aligns with national programmes and projects of key international development partners and works with humanitarian actors to respond quickly to humanitarian crisis. Through such partnerships, EnDev ensures that no one is left behind.

When you want to be very cost efficient, then it basically means most of the work has to be done by the local people. You are the most cost efficient if you can identify the bottlenecks and offer very targeted help to them when they need it. I think this is the future of development cooperation... they are in the driver's seat.

– Carsten Hellpap, freelance consultant and former EnDev Programme Manager

Ethiopia | Cooperative-led renewable energy solutions

From micro-hydropower stations to solar mini-grids, energy projects owned and managed by cooperatives are lighting Ethiopian homes, fuelling small businesses, and powering schools and clinics. EnDev supported the establishment of the infrastructure in these projects, but the communities themselves powered the change. They have taken on the challenge of sustaining community-run renewables, with support from EnDev and partnering civil society organisations. Cooperative solutions will be critical for Ethiopia's energy strategy, which aims for 35% of people without modern energy access to benefit from lasting off-grid solutions.

Read more

EnDev enters into these diverse partnerships because they generate wider impact. Partnerships ensure that interventions are demand driven, they catalyse market growth, and they leverage larger investments. Self-sustaining energy markets lay the groundwork for larger transformations.

Build multi-donor, multi-implementer action

EnDev's long work and ever-broadening impact surely owes much to its own collaborative structure. The two managing implementers, GIZ and RVO, have provided support to one another and other partners in turn. GIZ, functioning as the lead agency for the execution of the programme, has held overall responsibility for coordination and management. It has also made use of a widespread presence in the 26 countries where EnDev has delivered electrification results. RVO has co-managed the programme with a global overview, complementing GIZ through tasks related to strategy, quality control, learning, and strengthening networks with partners. RVO also focuses on advancing innovative approaches, such as those related to end-user subsidies, access to finance, and business development support.

As a fundamentally collaborative programme, EnDev has also invited in other implementing partners from the electrification sector. These have included the Association for the Development of Solar Energy (ADES), Association of Volunteers in International Service (AVSI), Collaborative Labelling and Appliance Standard Program (CLASP), Nordic International Support Foundation (NIS), Practical Action, and SNV. GIZ and RVO have at times operated as lead or direct implementers of country-level activities, other times as co-implementers within broader national initiatives. Through collaboration, all implementing partners have benefited from mutual support, knowledge exchange and joint learning, and the capacity to rapidly scale successful pilots.

What is most interesting about EnDev is that it's kept on going for 20 years. And I'd say a key reason behind that is precisely the setup with a handful of donors and two different entities forming the headquarters structure. There have been those situations where one of us was in trouble, and then the other one stepped in, that's just how it works. And then people move to other organisations and take along the knowledge. Because when you keep on going for such a long time, it also gives a lot of time to develop methodologies.

– Derk de Haan, Programme Advisor, RVO

Put donors on a shared path

Such concrete, sustained outcomes have brought in a large circle of like-minded donors over the years. The fundamental partnership orientation of EnDev was an invitation for donors to come in with their own ideas and strategic steering, while promising a consistent core programme with steady and lasting results. In this way, EnDev has almost certainly accomplished more than a single implementer and donor could do alone. In fact, it has been a rare example of consistent and sustained results throughout two decades that have seen the entry and exit of many donors. It has had the opportunity to go deeper and broader in its market development efforts, making the outcomes sustainable and the investments worthwhile.

EnDev enters into these diverse partnerships because they generate wider impact. Partnerships ensure that interventions are demand driven, they catalyse market growth, and they leverage larger investments. Self-sustaining energy markets lay the groundwork for larger transformations.

EnDev is about boots on the ground, being a trustworthy long-term partner and focusing on local capacity development. Building, initiating, or helping to initiate and build the sector, and preparing the ground for bigger investors and investments.

– Marcel Raats, former EnDev-Coordinator, RVO

Liberia | Partnering for stronger electricity access

Few Liberians are connected to either the national grid or off-grid solutions. In 2022, two entities were drawing up plans to change this: EnDev and the World Bank-funded Liberia Electricity Sector Strengthening and Access Project. Realising they were on parallel tracks, designing RBFs offering demand-side and supply-side subsidies, they decided to work together, and to build the capacity of Liberia's Rural and Renewable Energy Agency (RREA). EnDev provides end-user subsidies to make SHS affordable under the Dutch-funded global Demand-Side Subsidies Component, while RREA finances solar companies with funding from the World Bank. The partners hope to bring modern energy access to 33,000 people and unlock pathways to millions more through scale-up and replication.

Read more ↗

LESSON 2

The market-based approach is proven – but to reach everyone takes specific intent and creativity

EnDev has worked to develop and transform markets from the start. This choice relates to its ambitious goal of bringing energy access to millions of people.

EnDev started with a small programme budget relative to its ambition, and a spirit of friendly competition between country activities to produce the biggest sustainable outcome per euro spent. Working like this, it was the market-based approach that showed the greatest impact, and that has remained central to EnDev.

In fact, EnDev's market activities far exceeded the original goal, and have gone on to make historic breakthroughs in many countries. They have transformed markets for off-grid ventures, ranging from small rural distributors of solar appliances to large partnerships for electrifying social institutions.

Explore the full potential of RBF

Since EnDev first started testing the concept of RBF – with a UK-financed pilot spanning 14 countries between 2013 and 2019 – it has been a standout success story. Impressed with the results of this initial facility, EnDev carried the concept forward nearly everywhere and kept refining the carefully balanced incentive structure that makes it work. Crucially, it has embedded this support in complementary capacity building and business development services, consumer awareness creation, and efforts on the wider enabling environment. Especially when launching technologies in nascent markets, RBF is not a silver bullet without extensive technical assistance. But when companies are fully enabled, the tool has proven to be strikingly useful for delivering energy access.

More than 70 projects under EnDev have given a positive boost to markets across the electrification and clean cooking sectors. Some of these are combined projects bringing electrification and clean cooking together, and allowing learning about markets to flow between them. The RBF projects have seen hundreds of energy enterprises grow – but they're not just about growth. A well-designed RBF offers companies opportunities out to underserved markets with higher costs of entry, supporting sales while still allowing each company to develop its own approach and become self sustaining. See **Flagship Report** ↗ on a decade of RBF experience.

Uganda | RBF from the last mile to the last household

To energise remote communities, refugee settlements, and women who are left out of the market, EnDev has continued redesigning its approach over 7 years with companies distributing SHS in Uganda. Crucially, EnDev joined up electrification and clean cooking RBFs so each market segment can learn from what works in the other. This has, for instance, led to refinement in what counts as "remote", using GPS to calculate distance from urban hubs. Partner companies have clearly shown that they want to reach all customers and value the opportunity to do so with RBF behind them.

Read more ↗

> From my very first interactions with the EnDev team, it was clear they were pioneers in introducing results-based financing in the sector. I remember their first RBF scheme in northern Tanzania supporting the roll-out of stand-alone solar in remote rural areas. Those experiences, along with bringing RBF into the clean cooking space, are of immense value and continue to be a key contribution from the EnDev team.
>
> – Mikael Melin, Director, Partnerships & Development, Sustainable Energy for All (SEforALL)

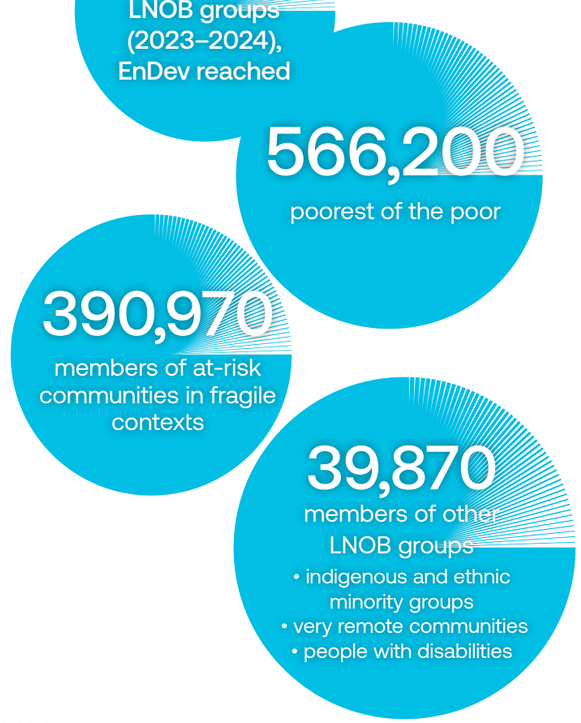
Identify where markets fall short

Once they get going, markets for renewable energy products can gain impressive traction and take off under their own power. There is no reason to assume, however, that they will work for everyone. EnDev continues to refine the market-based approach because all over the world people are still being left behind by commercial markets. Some people are too remote to be considered reachable by distributors, others simply cannot afford the products being offered. Some belong to marginalised groups – including women – whose needs and potential for entrepreneurship is sidelined. Many live in situations of displacement and insecurity and are thus considered too risky to serve. Wherever people are in danger of being exclude from electrification markets, they are included in the commitment to leave no one behind (LNOB).

Infobox | Leaving no one behind (LNOB)

When countries agreed on the Sustainable Development Goals in 2015, they pledged that "no one will be left behind" in sustainable development. The LNOB principle means that everyone should benefit from access to energy. EnDev therefore works to actively include people who are often left without energy access due to poverty, discrimination, displacement, or geographic location.

The new LNOB focus



Learn more about LNOB ↗

[4]reporting across both electrification and clean cooking

The LNOB commitment grew over time, whenever EnDev encountered the limits of markets. Country teams unexpectedly became involved in humanitarian action, such as delivering solar lighting during the Ebola epidemic in Liberia in 2014, or helping RBF recipients deliver solar equipment after Nepal's earthquake in 2015. In 2017, EnDev entered a formal cooperation with East African refugee camps and host communities. In 2023, it focused its commitment by defining a set of LNOB groups with specific targets, interventions, and reporting measures.

Respond with pro-poor, pro-women innovations

The market-based approach has had to adapt continually to ensure people are not left behind. This has motivated constant experimentation with mechanisms like RBF, accompanied by close monitoring and learning across all EnDev countries. All of this has had to be highly intentional, never incidental. And an especially high level of intention and ambition has developed around gender. EnDev has always operated on the idea that women should have choice, voice, and control over the adoption and use of electricity, and that they must overcome structural barriers to thrive in their enterprises and in the energy sector itself. EnDev activities going back to 2005 have energised women's lives by the millions – but that wasn't enough. In recent years EnDev codified these ideas in its transformative Gender Strategy, developed in a collaboration with ENERGIA. The **Gender Strategy** provided a basis for concrete country-level Gender Action Plans, which have delivered concrete results.

We wanted to start from what is happening on the ground, and then see what can be done in terms of gender, to reach the overall gender goals and at the same time, contribute to the overall programme goals. The country programmes started to think of gender transformation as not as something that stands on its own, but that's fully integrated with everything in their work.

– Soma Dutta, Senior Technical Advisor, ENERGIA, and author of the EnDev Gender Strategy

EnDev's role and strength in electrification lies in gender integration that fits local contexts, by designing interventions that recognise who is left behind in accessing electrification, who uses, how it is used, and who ultimately benefits. EnDev ensures health, education, productivity, and productive use of energy is accessible for women, men, boys and girls in their different intersectionality.

– Alinafe Irene Nonhlanhla Gama, Gender Advisor EnDev Malawi

Since 2022, intentionality around LNOB and gender has motivated a new category of results-based incentives: Demand-Side Subsidies (DSS). While past RBF operated on the supply side, rewarding energy entrepreneurs for reaching into more challenging markets, DSS directly reshape the ability of lower-income households to choose electrification by bringing down the cost of technologies. For LNOB goals, EnDev is finding that DSS and other demand-side solutions work best when combined with supply-side support to technology providers. Together, these approaches are enabling new markets to develop where they might otherwise be impossible. With time, a well-planned phase-out can leave the market running sustainably under its own power – always the end goal in EnDev's efforts.

Infobox | Demand-Side Subsidies (DSS)

DSS overcome the barrier of affordability by directly reducing the price of energy products for targeted consumers, enabling access to marginalised and low-income groups – ensuring that no one is left behind. However, to avoid market distortion, ensure ownership and preserve long-term sustainability, such subsidies must be carefully designed. To explore this relatively new off-grid market instrument further, EnDev has launched a DSS component with pilots in Liberia, Malawi, Niger, and Uganda.

Read more

Niger | Illuminating vulnerable communities

Light spills from homes and businesses, shining a warm glow across Bagaroua, a rural commune in Niger's Tahoua region. With reliable electricity access through SHS, children are now able to study for longer at night, families are gathering around the dinner table long after dark, and young entrepreneurs have exciting new employment opportunities. Even the many internally displaced families living in Bagaroua are able to install these systems through an innovative DSS pilot. The pilot brings down the price of off-grid solar solutions to make them affordable for internally displaced persons and host community members alike.

Read more

LESSON 3

Markets and technologies will keep developing **– and people should be able to climb the access tiers**

In 2005, electrifying the off-grid world was a monumental task. Solar panels were expensive pieces of high technology anywhere in the world. In many EnDev countries, electric grids were plagued by frequent power cuts even in cities, and did not reach far into rural areas.

Today, the economics of energy access are unrecognisable from 20 years ago. Solar panels, appliances, and systems are vastly more affordable. They are easier to set up, less often requiring technicians to size and install them. With help from EnDev's accumulated market development efforts, even remote and low-income households have choices on the market that simply didn't exist before.

Expect change, always

EnDev learned that anything is possible in technology markets. It had to keep up with progress and not shy away from innovative energy solutions, even ones that might seem too high-tech for the rural poor. Tech-enabled ideas like pay-as-you-go (PAYGO) emerged during EnDev's first two decades, proving that innovative doesn't have to mean expensive: it can also lead towards inclusive markets. EnDev embraced the trend starting in 2014, and found synergies with RBF, enabling companies to offer longer and more supportive terms for households who would otherwise remain left behind by electrification.

Mozambique | Solar energy transforms family life

Delfina Salvador's mobile phone flashlight was her family's only source of light at night. She had to pay to charge it at a nearby store, and after many nights of strain on the battery, a charge could barely provide an hour of light. After sunset and a rushed dinner, everything stopped. Now, her family are among the more than 230,000 people who have gained electricity access through a SHS through the RBF Fund for Sustainable Access to Renewable Energy (FASER). This financing model provides incentives to companies selling solar home solutions to expand their operations and reach vulnerable communities.

Read more ↗

PAYGO is just one example of how EnDev maintained pace with technological shifts, and the market shifts that result. As times change EnDev has consistently expanded its portfolio to incorporate more complex technologies, including within areas like electric mobility, electric cooking, and remote monitoring systems. EnDev did it by keeping its approaches diversified and experimental, and shared the results through its Learning and Innovation agenda. It extended supportive financing to new ideas, including under an Innovation Window for short, defined pilots. It also rolled out DSS mechanisms specifically to bridge the affordability gap around new technologies.

Infobox | Pay-as-you-go (PAYGO)

This digital payment model is increasingly popular for off-grid energy technologies in Africa. Rather than paying the full cost of a technology up-front, a household makes regular small payments as they use it, usually through mobile money platforms. Typically, the seller can remotely monitor the technology and deactivate it if payments stop. PAYGO aims to lower financial barriers for households with very limited cash on hand.

EnDev leveraged and facilitated innovation in electricity markets not only in developing new hardware, but also in disruptive smart systems like embedded IoT for PAYGO and energy metering. This enabled the private sector to scale market-based models for electricity access.

– Naimasa Tobiko Samwel, EnDev Kenya

We worked closely in the programme for solar lanterns in communities where people had limited access to grid electricity. One small solar lantern is not very costly, but it has a tremendous positive impact — particularly for students — by enabling safe lighting for study, improving educational outcomes and also growing his or her interest to study.

– Eng. Ratan Kumar Ghosh, Member, Sustainable and Renewable Energy Development Authority (SREDA), Bangladesh

Know how access stacks up

Another advancement since 2015 has been the **Multi-Tier Framework** for electricity access, jointly developed by the World Bank's Energy Sector Management Assistance Program (ESMAP) with inputs and contributions by EnDev and other stakeholders. This refines the definition of household electrification, from Tier 1 (lighting and phone charging) to Tier 5 (access equivalent to a full grid connection).

EnDev was there for the development of the multi-tier system and its further refinement, providing its practical experiences with applying the framework in the field. And rather than settling into a niche it has continued working wherever the needs and opportunities for progress are greatest in a country.

Enable households to get on the ladder where they can

It's important for households to get on the electrification ladder at a tier they can reach. With the falling price and improving reliability of technologies, solar is rapidly becoming accessible for everyone, especially on PAYGO terms. For the poorest households and those in the most fragile circumstances this may just be for lighting or phone charging at tier 1, but that, in itself, is a source of further potential.

The understanding of access to energy was just not that developed 20 years ago. When you read a report on work in energy, basically it said that people have access to electricity or not, it was a yes or no. There was no Multi-Tier Framework. I think we were one of the programmes in the beginning to figure that out and came back and applied information to this discussion, took part in it... as we have been involved, I think it's gone in the right direction, also following our experience.

– Andreas Michel, EnDev M&E Specialist, GIZ

And as markets and technologies keep changing, that household will hopefully be able to upgrade. A good energy access approach should be there to make the next step possible, too. One way to do this on a community level is through revolving funds: a model where communities invest in their own revenue-generating energy solutions and decide on how to re-invest the proceeds to further upgrade their communities.

The five tiers of household electrification and EnDev's reach since 2005

	Minimum power to household per day		People reached
Tier 5	8.2 kWh	Grid, mini-grid, or custom system	903,470
Tier 4	3.4 kWh	Limited grid or mini-grid	872,210
Tier 3	1.0 kWh	Mini-grid or SHS	260,570
Tier 2	200 Wh	Small SHS	1,808,380
Tier 1	12 Wh	Solar lantern or appliance	3,065,390

The market of the future may go beyond specific devices towards energy as a service. This is the standard model for grid electricity, where households don't have to own the infrastructure, but the model could even extend off the grid. EnDev has already piloted the approach in the specific context of dairy cooperatives in Ethiopia and Uganda: solar-powered cooling as a service gives farmers the opportunity to keep milk cold at collection points without having to buy their own cold-chain equipment. Here, the fit between products and markets is critical. New financing modalities and business models could reach even more market segments with transformative technologies and make renewable energy access more affordable. A household energy-as-a-service model is just one potential new direction for the vision of access tiers that households can climb with ease.

EnDev has a clear understanding of its target group and is agile in implementation. In Rwanda, we initially relied on results-based financing (RBF) to scale PAYGo models for financing solar water pumps. However, when it became clear that this approach was not reaching our target group, we designed and implemented microloans with a fintech partner that enable smallholder farmers to access sustainable irrigation without subsidies.

– Dorothee Viola Merkl, EnDev Rwanda

Mali | Revolving energy funds for fragile contexts

Rural communities in Barouéli, central Mali, were initially involved in an EnDev experiment with battery charging stations, but they turned this into a larger idea: residents supporting each other through revolving energy funds. Each is managed by a committee of residents, including a trained technician, who decide which solar projects the community invests in. Repaid from private income or communal fees into a microfinance account, the fund continuously regenerates, ensuring maintenance and enabling future investments. EnDev is bringing this idea to more fragile districts of the country, where instability and conflict keep donors away and communities are their own most trusted investors.

Read more

LESSON 4

Productive use of energy makes the connections – when the ideas are right to leverage impact

Too often, the missing connection in rural electrification is the economic case. Why put significant funds into a solar or hydropower mini-grid, or a kilometres-long extension of the grid, if you know there are too few households with too little demand to sustain the investment?

This kind of calculation has left many electrification plans to gather dust. But there are answers, and these often lie in connecting infrastructure investments with productive use of energy (PUE).

Infobox | Productive use of energy (PUE)

PUE is the application of energy in agricultural, commercial, or industrial activities that increase incomes and productivity. This can either be thermal or electrical energy, with each having a large catalogue of different applications. Electrical PUE might be motorised machinery such as irrigation pumps, food mills, and electric transportation, or it can be something less obvious like a refrigerator, electric cooker, or television used to enhance a profitable business.

Generate supply, demand, and impact together

The connection goes both ways. Certainly, a PUE project like a flour mill or irrigation pump needs a source of energy to work. But EnDev's experience has taught it that rural electrification needs PUE, too: it serves as an economic engine and a driver of sustainable demand. PUE makes infrastructure projects profitable and bringing life-changing energy access to surrounding households, schools, and health centres.

It is quite interesting how innovative people are when it comes to generating income. Sometimes it's enough to be able to afford a TV, then you can set up a closed space and start a video hall. Or it can be opening a hair salon. Very small products can actually generate income. However, most require at least Tier 3 access, which is why we push to close the mid-tier gap – to enable income.

– Veit Goehringer, former EnDev Electrification Lead, GIZ

EnDev has found that PUE can drive electrification in all sorts of countries and contexts. In particular, it can bridge the gap between lower-tier access and higher, more economically impactful, tiers. PUE also drives EnDev's engagement with micro, small, and medium-sized enterprises (MSMEs) on a large scale. EnDev has supported more than 66,000 MSMEs in gaining electricity access, across agriculture, manufacturing, and services, always with a focus on local markets and jobs.

Power women's ideas

PUE is also an engine for women's empowerment, helping women start new businesses and raise the productivity of existing ones. By 2024, 34% of the PUE enterprises that EnDev was supporting were led by women. The great majority of these women-led businesses used their technologies for food production or agricultural processes. This included using electrical equipment to pump water to their fields, mill grain, and cool or freeze drinks and food items.

On the one hand EnDev considers women as part of the LNOB group, and yes, it's important to recognise how they can be vulnerable and hard to reach. But it's good that we also get beyond that and see women taking the lead in enterprises, which really has a lot more to do with gender equality.

–Sindy Karberg-Manuel, EnDev Gender Lead, GIZ

Enterprises and employment

66,520
MSMEs have adopted electrical PUE technologies through EnDev

In 2014, EnDev started tracking new employment indicators. Since then:

The MSMEs have added
19,790
part-time jobs through PUE activities.

6,980
people have been newly empleyed in running mini-grids and distributing solar technolgies.

Bolivia | Fresh ideas with a taste of honey

The Women's Energy Fund (FEM) in Bolivia has become one of EnDev's most successful PUE efforts by leveraging the innovation of women's groups through open calls for ideas. There was no shortage of ideas: shredding llama meat, extracting cosmetic oils from Amazonian cusi nuts – and even harvesting honey from Melipona, the native stingless bees of Chuquisaca. The beekeepers co-designed a solar-powered electric honey pump, which means the pot-like structures in which the bees produce their highly valued honey don't need to be destroyed. The pump reduces the time to harvest a kilogram of honey from almost 4 hours to less than an hour. Working with ideas like this across 29 rural enterprises, FEM brought new powered devices to 950 women and 400 men, increasing productivity by an average of 670%.

Read more

Don't look for one perfect machine

The biggest lesson has been that there is no one perfect machine to fill the PUE role. Not every community needs an irrigation pump or mill. Everywhere EnDev has worked, the best PUE technology has been something that makes local sense, and often something wonderfully specific. It might be extracting honey from beehives; it might be welding, running computers, or styling hair; it might be plying the waters in an electric boat; or it might be refrigerating drinks for shop customers. The fact is a global programme like EnDev just doesn't know what idea is right. It takes knowledge and ingenuity from local partners to find the best solutions. PUE is inseparable from partnership for EnDev, and the funds and initiatives that back smart ideas from MSMEs have gone the farthest to generate income and electrify communities simultaneously.

To be an effective and sustainable PUE business, it first and foremost has to succeed as a business. Providing the technology doesn't automatically result in income generation. The launch of ingenious locally-powered ideas also comes after a lot of supporting work by EnDev and its partners, which is essential to make PUE truly transformative. Success often requires significant awareness raising among potential users, and ensuring that there is actually demand for the products and services resulting from PUE. Technical training equips people to use the equipment. Business development support helps MSMEs identify what investments they can afford and how to generate a profit. Through these steps, the right technology becomes the perfect machine to drive incomes and electrification together.

Indonesia | A solar-powered boat making waves

The remote island of Rote has energised local tourism by taking visitors on almost silent eBoat tours around its idyllic inlets. This unusual example of PUE was built on a strong foundation of innovation and learning by EnDev, that started with a review of hundreds of mini-grids installed in remote locations like this by the Indonesian government. It found less than 50% of the solar energy was used. Meanwhile, fuel for boats is quite hard to access and inflated in price. Thus on Rote, EnDev ensured that a mini-grid was installed near the water where it can power this pilot craft for a future of electric transport.

Read more ↗

LESSON 5

Monitoring has to balance reality and simplicity – because a connection isn't just a switch to flip

EnDev was founded with a clear outcome orientation, aiming to make sustainable access to modern energy possible for millions of people, using a set budget.

This ambitious goal meant that EnDev had to collect tangible and verifiable numbers to ensure the concrete reality of its results, leading to the establishment of a detailed monitoring system. In its early years (and before Europe's General Data Protection Regulation), it was hypothetically possible to track any individual reported result to a specific household using a specific energy solution. Aiming for the highest precision, EnDev asked its partners to collect extensive data. By 2018, the partnership had also conducted more than 250 baseline, impact, and sustainability studies to verify its assumptions, assess long-term effects, and check back on the sustainability of its results.

Ground your results

This was a time-consuming effort – especially in the early years when monitoring meant travelling around with paper and pens, capturing results one checkbox at a time. But the effort paid off in two ways: it offered donors reliable outcomes that were rooted in reality; and it let EnDev make highly informed decisions about what was working best, to direct what came next. The complexity soon grew to include important but intricate formulas accounting for:

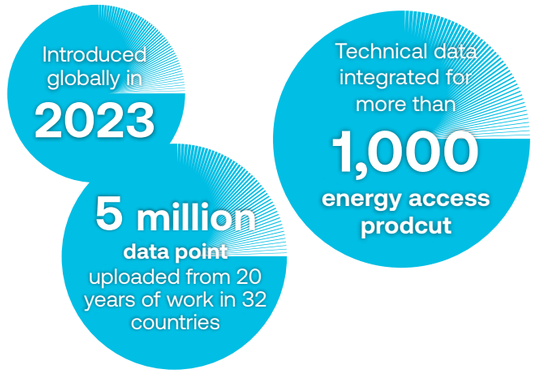
- **Sustainability** – how long an access solution was expected to remain in use
- **Additionality** – how much the outcome exceeded the existing pace of energy access
- **Attribution** – what could be credited to EnDev directly

As reports gained more footnotes and formulas, it became very difficult to explain the concrete impacts to external audiences. Recognising the burden and the difficulty in communicating such intricate data, EnDev later sought to simplify its monitoring approach without compromising its core principles. This re-adjustment process, taking place around 2020, allowed it to maintain a flexible approach that responds to local demands and integrates innovations.

Refine monitoring for the 2020s

The system – including data collection, aggregation, verification, and analysis – continuously undergoes refinement. Far from its clipboard-bound beginnings, EnDev now has an end-to-end digitalised monitoring process, from on-site data entry to global aggregation. In the balancing act between precision and clarity, its focus has stayed on achieving impact – honouring why real-world monitoring matters rather than getting lost in detail.

EnDev's current monitoring platform[5]



More tools have been introduced in supporting roles along the way. Carbon emissions mitigation calculations were added and are continually updated to follow refinements in United Nations methodology. New focuses on LNOB groups and eCooking have required new tools and been incorporated into the monitoring platform.

Nepal's data-constrained context requires to systematically disaggregated data that shows who benefits, where, in what ways, and where gaps remain. By balancing analytical rigor with practical feasibility, EnDev has produced simple yet meaningful insights on inclusion and LNOB outcomes without overburdening partners or beneficiaries.

– Ojash Man Sinh, EnDev Nepal

The quantitative approach is complemented by important qualitative tools and methods to ensure we have a complete picture. For example, with the Energy Access Market Development Scorecard methodology, EnDev systematically tracks the market environment for energy access interventions as it improves. EnDev commissions external evaluations of phased-out countries, and it held an independent real-time evaluation for the period of 2020–2023.

[5] Figures from 2023

We now have a much clearer monitoring basis. Country teams submit a Vulnerable Groups list outlining what they intend to do on LNOB over the year, which then forms the basis for the monitoring cycle. This provides the foundation for a full picture of LNOB efforts across EnDev.

– Olivia de Vesci, EnDev LNOB Lead, GIZ

Rwanda | A monitoring system for pro-poor RBF at scale

Rwanda has made remarkable progress in energy access, from 19% in 2013 to 82% in 2025. One key force was EnDev's evolving solar energy RBF. For alignment with national pro-poor goals, this used the government's Ubudehe categorisation, reflecting the socio-economic welfare of households, to set different DSS levels. EnDev and USAID developed an Off-Grid Monitoring Information System (OMIS) to consolidate data on electrified households from solar companies and mini-grid developers. An easy-to-use tool helped companies check customers' DSS eligibility and track sales in real time, while integrating into OMIS for verification and overall EnDev monitoring. EnDev then handed OMIS over to the government, which in 2021 scaled up the approach with support from the World Bank's Renewable Energy Fund into a $30 million nationwide programme.

Read more

Reflect what access means

The core realisation remains the same: it is not a yes-or-no statement to report that someone "has access" to electricity. The quality of access differs significantly between technologies, and its long-term sustainability depends on a host of factors, from simple economics to possibilities for repair and household resilience in sometimes fragile contexts. Reporting on results is more nuanced now, striving to communicate what matters and feeding back into improved efforts. Monitoring still, however, draws on a large body of data. Much of it is collected by solar companies receiving RBF support, and by EnDev as it verifies their results before making incentive payments.

Nepal | Pressing ahead in the tailoring business

Ganesh Kumari's tailor shop is flourishing thanks to her electric ironing service. It all started when EnDev facilitated a grid extension to her Himalayan village in 2009, and then, with its partners, trained entrepreneurs on uses of electricity in tailoring. She no longer fills her room with smoke from a heavy, slow, charcoal-heated iron, she doesn't burn her hands, and she can precisely adjust the temperature on her electric iron for perfect work and satisfied customers. Next, she wants to purchase an electric sewing machine with a low-interest loan. Ganesh is just one of more than 4,500 entrepreneurs supported in Nepal – and each of them has their own story about how life has changed.

This monitoring effort shows results, by the millions of households. However, EnDev puts sustainability first – even when accounting for broken or abandoned systems means it has to report lower numbers. A sustainable impact is worth a great deal of trial and error, after all, and a commitment to reality in monitoring is paramount if the final goal is change that lasts.

EnDev is about real people – that may sound a bit odd, but in practice it means we report on people who have now access to energy, not theoretical connections once a project has been implemented. This makes monitoring far more complex, but also central to EnDev´s credibility and reputation. Robust, evidence-based monitoring is a key strength of the programme, while at the same time requiring continuous review and adjustments. The challenge we constantly navigate is finding the right balance between robustness, feasibility and cost-effectiveness, because high-quality data is a core asset underpinning the trust of our partners and donors.

– Barbara Richard, EnDev Team Leader, GIZ

LESSON 6

There are two sides to energy access in a household – and eCooking brings them together

In EnDev's programme countries, most households – and, indeed, most social institutions like schools and health centres – can benefit from energy in two forms. One is electricity, to provide light, run a refrigerator, and everything else this modern wonder offers. The other is cooking energy: the fuel or energy source that generates heat in a stove under a pot. What if these two sides of energy access were one and the same?

In higher-income countries they commonly are: people cook with electric appliances. And EnDev firmly believes, after 20 years of tackling both electrification and clean cooking, that the time has come for accessible electric cooking in the Global South too. Far from just another kind of stove, eCooking is a sector-bridging technology that can radically change both sides of the energy equation.

Rather than a separate stand-alone issue, cooking is such a fundamental part of day-to-day life that it obviously cuts across a whole range of different aspects of EnDev's work, and indeed of our work – including as a massively important load for electricity.

– Ed Brown, Research Director, Modern Energy Cooking Services (MECS)

Electric frontier

EnDev began piloting eCooking in 2020, and has since supported technologies like **electric pressure cookers, induction stoves**, and **rice cookers** in **13 countries.**

Plug the kitchen in

For people cooking in difficult and disadvantaged contexts, eCooking represents a leap to Tier 5, the top of the clean cooking MTF. That leap is boosted by the power of synergy across sectors – something EnDev knows a lot about. As electrification reaches more communities, and where power tariffs are affordable, households that formerly bought cooking fuel can save significant money by adopting efficient eCooking technologies. More demand for electricity brings electricity to more households, and that demand can ideally be met with renewable sources.

As the market ramps up, there's also rising demand for electric cooking appliances with higher efficiency at affordable prices. Urbanisation is a powerful context for these shifts. However, with the right approach and enabling environment the economics can work even in remote areas, as well as in refugee communities and other challenging markets, where fuel costs are often a heavy burden. In lifting that burden, eCooking also does away with direct emissions from cooking. Combined with the suitability of powered devices for collecting precise usage data, eCooking is an ideal testing ground for connecting stove users with carbon markets, such as through carbon credit and cook-to-earn concepts.

Kenya | A cooking plan for a fast-electrifying country

Kenya is bounding ahead in electricity access, which recently reached a rate of 75%, and eCooking might be the perfect accompaniment. Starting when the technologies were virtually unknown in Kenya, EnDev helped the private sector make eCooking a real option through RBF and other forms of support. Then, Modern Energy Cooking Services (MECS) and EnDev supported the government in developing a national electric cooking strategy. Kenya is showing how progress in electrification can lead to clean cooking progress. Through joint planning eCooking can become affordable and even highly attractive. Kenya aims for 10% of households to be cooking with electricity by 2030.

Read more

Where there is electricity, there is potential for eCooking technology adoption. There is uptake from different market segments – from the urban middle class working woman who has disposable income and who wishes to save time, to households who need innovative finance such as cook-to-earn or PAYGO to enable affordability of upfront costs. There are also rural settings where electricity access is more of a challenge – but this does not mean they should be excluded. New connections and stand-alone systems can provide solutions in rural contexts. It's very appropriate that EnDev has this mindset of, yes, there's low-hanging fruit of connected households who use electricity but not for cooking usage, but at the same time let's not forget other last mile communities.

– Alicia Butterfield, Global Manager, Global Electric Cooking Coalition (GeCCo)

Find the approaches that bridge sectors

The recent turn to eCooking has deep roots in EnDev's history. The partnership has always looked at energy access holistically, with country teams pursuing electrification, clean cooking, or both based on their assessment of the greatest needs and opportunities. Lessons learned in one sector have become invaluable in the other. National partners have built capacity, networks, and policies that benefit both sectors. In some instances, the same market development approaches have worked across electrical and clean cooking technologies, as evidenced by successful cross-sector RBFs.

From this cross-sector philosophy, eCooking represents a step into full sector coupling. Importantly, it solidifies the economic case for electrification, whether through grid extension or mini-grids. Where low demand would limit a community's electrification prospects, demand for cooking – redirected from the biomass market – increases electricity demand and therefore enhances the economic viability of electricity production and supply. Incorporating significant eCooking demand into a system's design and business plan can ensure the investment will be fully utilised by the community and viable for the long term.

Coordinate globally to shift conventional thinking

eCooking is considered ambitious for a reason: it takes a systemic reconfiguration for a household to jump from a firewood stove to an electric kitchen. And a systemic change requires a highly coordinated approach. Many actors have to unite around national strategies, integrated energy planning, affordable electricity tariffs, behaviour change campaigns, and eCooking appliances offered on the right terms for all. EnDev has put a call out to all the actors as a founding partner of the Global Electric Cooking Coalition (**GeCCo** ↗). It advises the growing circle of GeCCo members and Country Action Groups on concrete interventions to take forward, based on its many years of implementation expertise. With the other GeCCo partners, EnDev also set up the Global eCooking Accelerator in 2023 with a shared goal of reaching 500,000 people by the end of 2025 – a goal the partners overachieved.

One of EnDev's unique selling points is the fact that the programme is excelling support mechanisms both in the cooking and electrification spheres. Focussing on market development and retail structuring for rural, remote and last mile areas, business development services and result-based financing mechanisms are key instruments to enable the local private sector to sell their products. So, much of the technical approaches may seem transferable across technologies. Yet, providing access to modern cooking technologies and off-grid electricity require specialized expertise and knowledge. EnDev is the rare programme with both, covering modern energy access for cooking energy and electricity.

– Monika Rammelt, Programme Manager, GIZ

Laos | A truly ambitious 'Smoke-Free' vision

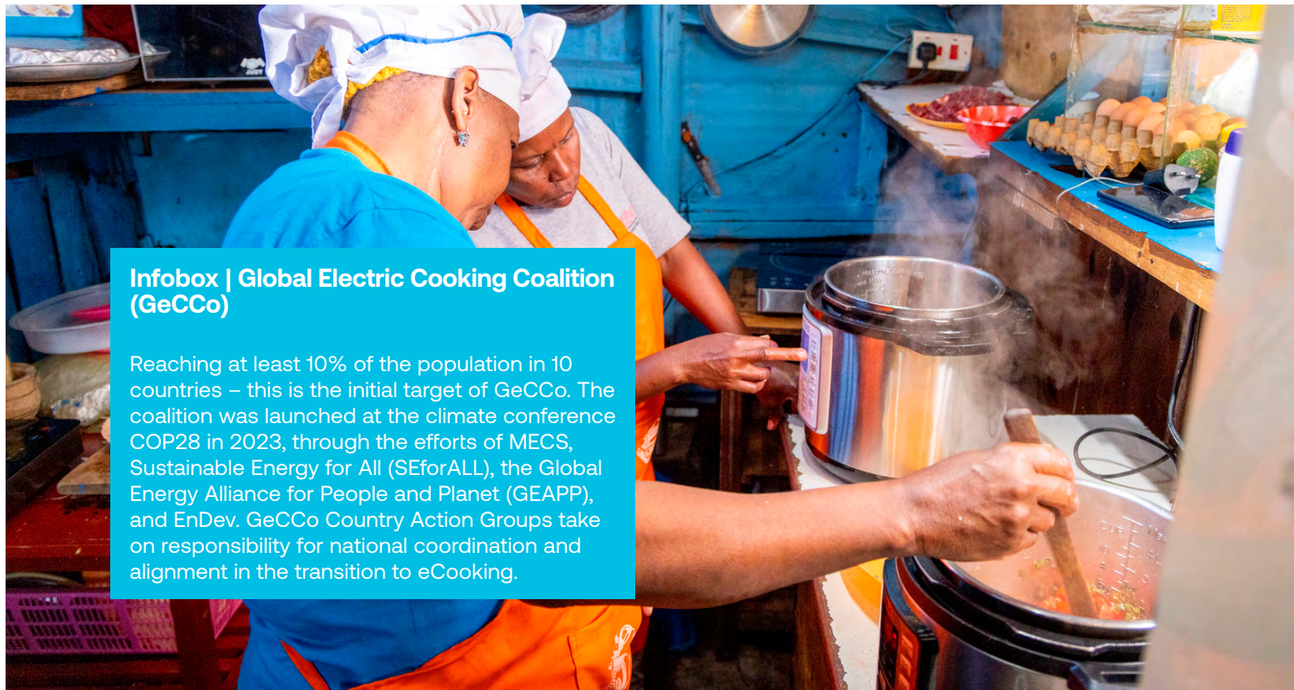
Laos set a striking target: by 2030, 90% of the population should be cooking with electricity. Acting on this ambition, it became one of the first countries to join GeCCo and is developing a national eCooking strategy. EnDev is providing policy support to ensure the development of a solid strategy aligned with climate goals. This policy work is complemented by support to the design of innovative financing for eCooking, and a behaviour change campaign by EnDev's implementing partner SNV to transition communities into Smoke-Free Villages. The campaign has motivated thousands of households to adopt the eCooking vision, with 22 village committees signing on in 2024.

Read more ↗

As the growing global momentum within GeCCo shows, eCooking is not only a sector connector, but also an interface between national and international priorities that contributes to achieving climate and access targets. All of which makes it an exciting new chapter in EnDev's story.

What makes EnDev truly stand out is its ability to build, strengthen, and support sustainable energy markets, especially in rural, peri-urban, and underserved communities. I particularly commend EnDev for its Global eCooking Accelerator that is working to fast-track the transition to clean, electric cooking, and the objectives of GeCCo.

– Damilola Ogunbiyi, CEO and Special Representative of the UN Secretary-General for Sustainable Energy for All



Infobox | Global Electric Cooking Coalition (GeCCo)

Reaching at least 10% of the population in 10 countries – this is the initial target of GeCCo. The coalition was launched at the climate conference COP28 in 2023, through the efforts of MECS, Sustainable Energy for All (SEforALL), the Global Energy Alliance for People and Planet (GEAPP), and EnDev. GeCCo Country Action Groups take on responsibility for national coordination and alignment in the transition to eCooking.

CONCLUSIONS

Electrification will succeed by making all the right connections

Despite achievements measured in the millions, electrification is not about constant upward progress. If sustained access numbers don't rise fast enough, they can easily fall behind population growth, and be cut down by external shocks like pandemics, conflict, climate chaos, and economic turmoil.

As we draw closer to 2030 and the SDG 7 target of electrification for all, the number of people living in poverty will likely continue to rise along with the population in sub-Saharan Africa. This could nearly cancel out electrification progress elsewhere in recent years. Where these hundreds of millions of people are out of reach of normal electrification markets, normal isn't good enough. Committed pro-poor action in electrification markets is here to stay.

Therefore, the learning that has come out of EnDev needs to be applied, urgently and widely. EnDev is doing that, and it is far from alone. With no time to lose, every willing organisation, government, and enterprise can be a part of unlocking electricity for all.

EnDev developments were all RVO developments as well. The market paradigm is part and parcel of all our activities; the Energy Access Market Development tool developed by EnDev is being used in our programmes, and so is the Results-based Financing that was pioneered by EnDev in the energy sector. One way or another, we've incorporated these in all of our programmes, taking the lessons that we learned within EnDev and developing them further.

– Marcel Raats, former EnDev-Coordinator, RVO

It took time to build our gender-transformative infrastructure, but it now gives us a strong platform for action. And it's sustainable: even if EnDev ended, the capacity would remain in-country with the people and gender focal points we work with. They carry that learning forward into other projects — so the impact continues.

– Sindy Karberg-Manuel, EnDev Gender Lead, GIZ

EnDev is this continued, trusted presence for national partners, who can easily contact us for some training, or with a question on the rural electrification policy. This came to bear fruit a few years ago when we were asked by the UN to develop Energy Compacts with our EnDev country governments, along with SEforALL as another important player. EnDev was really a trusted partner in the Compact creation process.

– Jan Cloin, former EnDev-Coordinator, RVO

EnDev brings critical resources in strengthening electrification efforts by demonstrating innovative implementation approaches and advocating for sustainable, long-term solutions in the policy and decision-making arenas.

– Amalia Suryani, formerly EnDev Indonesia

We need to not only to look into scale but also what governments actually have planned in their national strategies, or have tasked themselves with in their NDCs. There are some countries that are very much looking into electric cooking, others are looking into universal access to electricity for all their people. The trend has to be to really respond to that and see how to cooperate with other actors to get to scale and visibility and real ownership.

– Veit Goehringer, former EnDev Electrification Lead, GIZ

Anyone looking for a role will find many available. A good place to start is in national strategies and plans, which have been crucial in defining roles, in many cases with involvement from EnDev. The partnership's engagement and demonstrative results contributed to Bolivia's Law for Universal Access to Electricity back in 2009, and many other countries' advances since. Focus has now turned to the Nationally Determined Contributions (NDCs) on climate action: for instance, in Peru and Rwanda EnDev has supported the design of Nationally Appropriate Mitigation Action proposals to achieve the countries' NDCs through low-carbon electrification.

In service of these plans, larger partners like the World Bank and End-User Subsidy Lab are actively scaling up RBF and DSS approaches, while coalitions like GeCCo carry promising solutions and markets forward at a global level. EnDev is continuing to invite in more financiers, investors, and development banks as markets mature, and reaching out to partners in other sectors such as agriculture and transport to pursue more forms of PUE.

This is where EnDev's beginning as a broad partnership comes full circle, and where it goes even broader. The future of electrification will not be a single miraculous technology, or a single massive investment spree. The future will be a whole lot of connections made – in every sense.

Funded by:

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Ministry of Foreign Affairs of the Netherlands

Norad

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

Coordinated and implemented by:

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Netherlands Enterprise Agency

Imprint

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Registered offices Bonn and Eschborn, Germany

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn
Germany
T +49 61 96 79-0
F +49 61 96 79-11 15
E info@giz.de
I www.giz.de

Contact:
Energising Development
E endev@giz.de
I www.endev.info

Authors:
Paul Farah Cox (Scriptoria Ldt)

Editors:
Nancy Balbin Chavez, Verena Brinkmann, Veit Göhringer, Patrick Pawletko, Lotta Schütt, Till Serafimov (all GIZ/EnDev),
... and many thanks to all EnDev colleagues involved.

Designed by:
AKRYL GmbH

As of: April 2026

endev