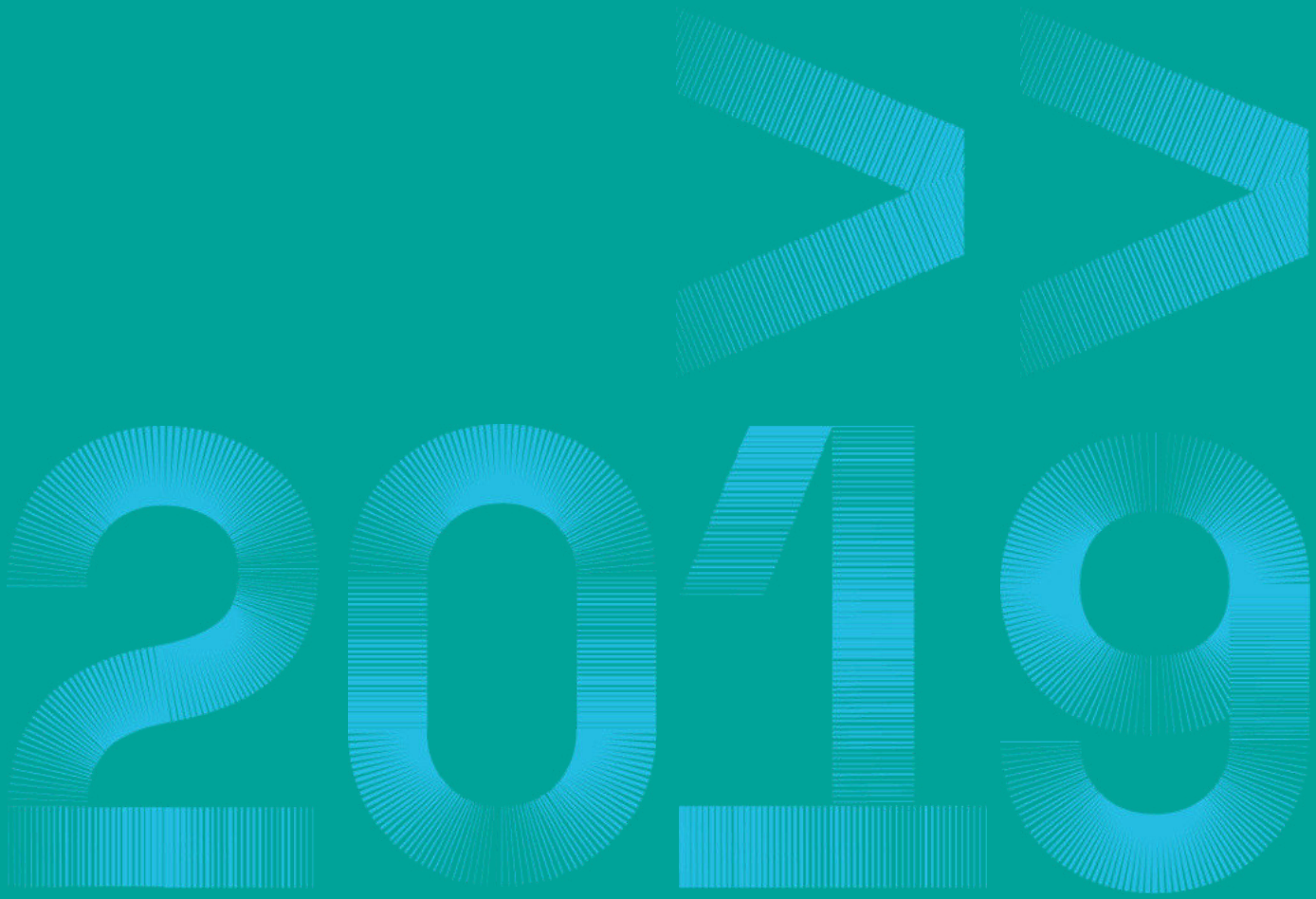
Energising Development
Progress Report 2019

Final Version



endev

Energising change

Partnership between

The German Federal Ministry for Economic Cooperation and Development
The Netherlands Ministry of Foreign Affairs
The Norwegian Agency for Development Cooperation
The Swedish International Development Cooperation Agency
The Swiss Agency for Development and Cooperation
The UK Department for International Development

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Collaborative Labeling and Appliance Standard Program (CLASP)
Humanistisch Instituut voor Ontwikkelingssamenwerking (HIVOS)
Nordic International Support Foundation (NIS)
Practical Action
Netherlands Development Organisation (SNV)

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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, self-sustaining 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, or 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, Sweden, Switzerland, and the United Kingdom; donors who are committed to accelerating energy access and socio-economic development.

Key achievements

16.8 million
Household members with improved cooking solutions

22.9 million
People with access to modern energy

6.1 million
Household members with electricity

53,860
Small and medium-sized enterprises with a modern form of energy for productive uses

2.3 million
million t of CO_2 saved per year

27,390
Social infrastructures with a modern form of energy: among them 18,059 schools and 2,000 health centers

1. Executive summary

Status in brief

EnDev aims to achieve sustainable access to modern energy for 27.5 million people by 2022 with a currently planned total budget of EUR 382 million. By the end of 2019, EnDev facilitated sustainable access to modern energy services and technologies in total for 22.9 million people, 27,390 social infrastructures and 53,860 small and medium-sized enterprises. In 2019 alone, 1.6 million people, 1,035 social infrastructures and 7,615 small and medium-sized enterprises were reached. 23,572 people are employed either in the related supply chains or directly in the enterprises that were provided with energy access. EnDev interventions saved 2.33 million t CO_2 emissions in 2019.

Key trends

Regionally, the focus on sub-Saharan African countries slightly increased in 2019. 66% of the funds were committed to sub-Sahara Africa, 62% of the global results can be attributed to this region. 71% of the target achievement on household level comes from access to thermal energy, while households with access to electrical energy contribute 29% to the overall target achievement. This ratio has slightly shifted towards electrical energy in 2019.
The 1.6 million people reached in 2019 corresponds to an overall increase of 7%.

From 27,390 social infrastructures reached, 1,035 received access in 2019 which is an overall increase of 4%. In total, 2,000 health centers and rural clinics were provided with access to modern energy, a majority of 1,430 are located in sub-Saharan Africa. A large share of results achieved stems from projects that are being phased out or have already ended. For 2020, a moderate growth of 1,400 social infrastructures is expected with a focus on electrification.

53,860 small and medium-sized enterprises were reached while the share of access to electricity and access to clean cooking stands at parity. In 2019 as well as in 2018, the number of additional small and medium-sized enterprises increased in comparison to the previous year above average. In 2019 7,615 small and medium-sized enterprises received new access which is an overall increase of 14%. It is expected that this trajectory will continue with an average 11,000 additional small and medium-sized enterprises to be reached annually until 2022. The majority of SME have access to electricity. It is expected that this trend will continue.

In total, 11,786 full-time equivalent jobs exist in partner countries that can be attributed to EnDev. As most real jobs are part-time it is estimated that 23,572 people are employed that can be attributed to EnDev.

In 2019, 2.33 million t CO_2 were saved that can be attributed to EnDev. It is expected that the annual saving will follow a steady and moderate growth path during the upcoming years. The expected results from EnDev's upcoming GCF-funded activities, will contribute to a more dynamic development on the emission reductions.

Financial situation

EnDev is looking back on a successful year in 2019 in terms of securing additional funds. In 2019, EnDev secured funds of EUR 25.25 million with a main contribution

from Norway (Norad) as unearmarked joint program funding (EUR 13.84 million). New commitments also included contributions by BMZ, DEZA, ICEIDA, Irish Aid, and USAID as earmarked funding for specific countries or particular technological approaches (EUR 11.41 million). Additionally, the Netherlands (DGIS) has committed EUR 31.25 million as unearmarked joint program funds. These new contributions (EUR 56.50 million) represent 16% increase. In addition, 2019 brought the Green Climate Fund's (GCF) approval of EnDev's project proposal on the promotion of climate-friendly cooking with a tentative total additional budget of EUR 51.16 million. Additionally, DGIS committed EUR 8.75 million for specific activities at the global level to be implemented directly by RVO.

EnDev's Governing Board held two regular meetings in 2019. The 20th EnDev Governing Board meeting took place in June 2019 in Bern and was chaired by Switzerland (DEZA). The 21st EnDev Governing Board meeting took place in November 2019 in Bonn and was chaired by Germany (BMZ).

Challenges

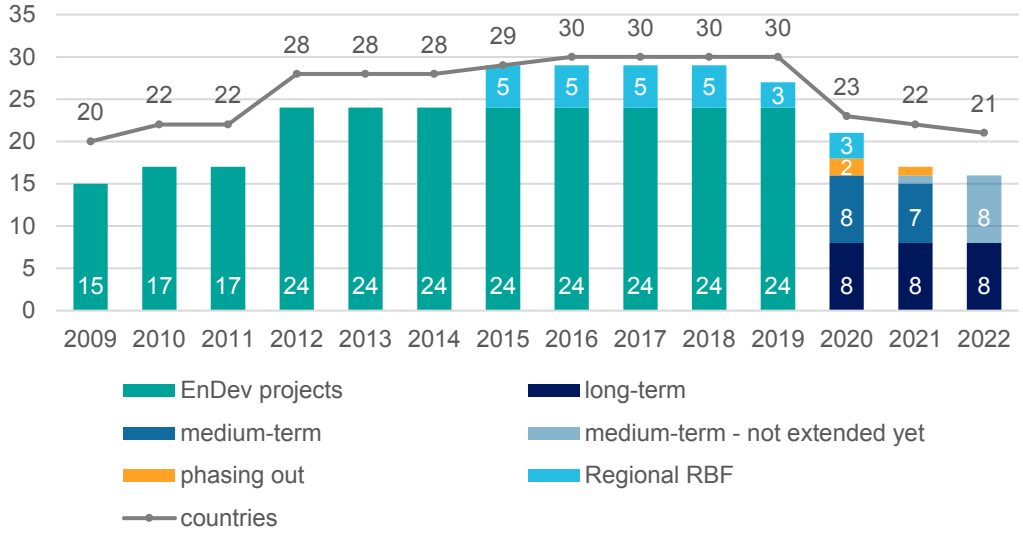
A slightly reduced implementation speed resulting in a lower than projected target achievement can be observed for 2019. The main reason for this delay was the portfolio-wide (re-)programming in early 2019 and the following operational re-start in the second half of 2019. However, over the course of 2019 it could be observed that operations kicked in and target achievement developed more positively towards the end of the year, thus showing signs of getting back on track.
EnDev's strategic target is to reach 27.5 million people by 2022. This target is ambitious, although it appears within reach. However, it is expected that the implications of the COVID-19 pandemic will affect future target achievement. It is too early at this stage to provide robust estimations or projections on the expected developments but negative impacts on target achievement will at least be noticeable if not significant. EnDev will be investigating the pandemic-induced implications to factor this in in future projections.

Portfolio development

The development of the EnDev portfolio as decided in the *Annual Planning 2019* is now starting to be reflected in the reduced number of projects. The ending RBF facility adds to this development. Figure 1-1 presents the number of projects and countries for the last ten years and projects the potential future portfolio until 2022. It can be clearly seen that under the current strategy the portfolio is foreseen to be consolidated. At the moment, a continuation of the eight long-term projects is scheduled, provided additional funding will be available another eight medium-term projects might be extended into 2022. Refugee activities and cooking sector support and coordination will close as separate activities and continue in the respective country projects.

Figure 1-1

Number of EnDev countries and projects[1]



[1] Two regional RBF projects expected to be extended in the *Annual Planning 2020 update*.

Senegal

Pushing boundaries with solar power

In a field traditionally dominated by men, Yvonne Faye is the first business woman to successfully bring solar power to thousands of homes in Senegal

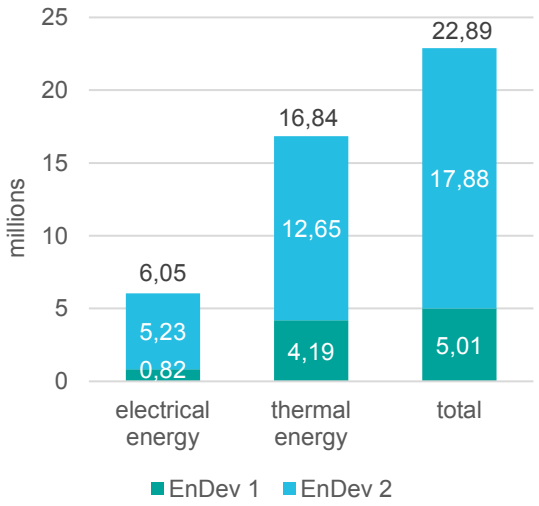
Yvonne Faye has much to be proud of: with a degree in Electrical Engineering and Computer Science, she is the first and only female solar energy operator in Senegal. Challenging gender stereotypes and traditional gender roles, Yvonne has worked with the technology that converts sunlight into electricity throughout her career. In 2004, the mother of four founded her own company and was the first entrepreneur in the country to install decentralised solar power plants. These government-owned mini-grids provide energy to households in remote areas that are not connected to the national grid. Today, Yvonne operates 20 of these solar plants with a staff of 29. More than 1,000 households and institutions in southern and central Senegal benefit from the solar energy, as well as solar antennas for mobile communication. 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. Sadly, gender is one of the most challenging aspects in this field, yet I strongly believe that more women should become involved in the sector.”

2. Outcomes and impacts

2.1 Dashboard

Since 2005, EnDev facilitated sustainable access to modern energy services and technologies for about **22.89 million people.** 5.01 million people were reached already during EnDev 1. EnDev 2 facilitated sustainable access to modern energy services and technologies for about 17.88 million people. During EnDev 2 access to electrical energy is now available for a total of 5.23 million people (29%) and 12.65 million people (71%) have access to improved and more modern forms of thermal energy (Figure 2-1 and Figure 2-2)

Figure 2-1
Number of people reached – EnDev 1+2



Regionally, the focus shifted slightly to sub-Saharan African countries from 62% in 2018 to 66% in 2019 of committed EnDev 2 funds (Figure 2-3). The share of least developed countries (LDC) supported by EnDev is 67% (Figure 2-4). 56% of expenditures can be allocated to electrical energy and 44% to thermal energy (Figure 2-5).

Figure 2-2
People reached by technology

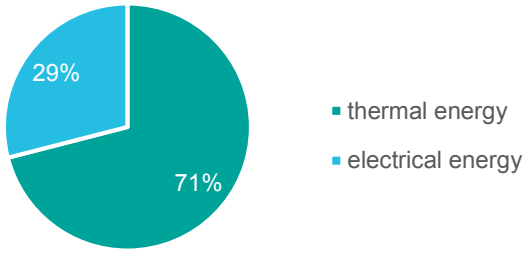


Figure 2-3
Funding by region

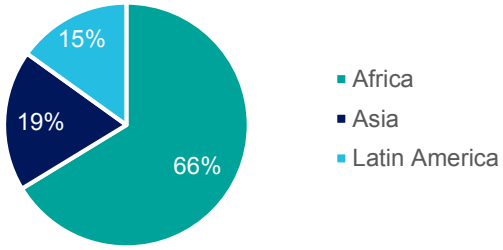


Figure 2-4
Funding by country classification

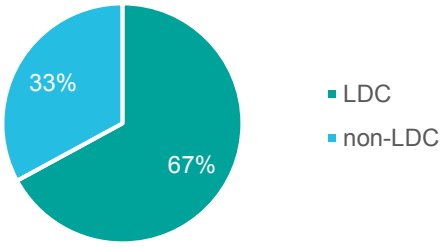


Figure 2-5
Expenditures by technology

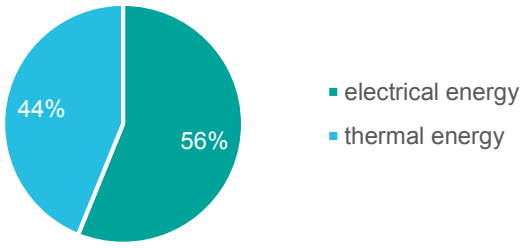


Table 2-1

Countries[2] and technologies in 2019

		Stoves	Biogas	Other cooking	SHS	picoPV	Solar	Hydro	Grid	Other lighting
country projects	Bangladesh	●				●				
	Benin	●			●	●			●	●
	Bolivia	●				●			●	
	Burkina Faso	●								
	Cambodia		●							
	Ethiopia	●			●	●		●		
	Ghana	●							●	●
	Indonesia						●	●		
	Indonesia biogas		●							
	Kenya	●				●	●			
	Liberia (with Sierra Leone and Guinea)	●		●		●	●			
	Madagascar	●								
	Malawi	●				●				
	Mali	●			●	●	●			●
	Mozambique	●				●		●	●	
	Nepal	●						●	●	
	Peru	●		●	●	●			●	
	Rwanda (with Burundi and DRC)	●	●			●		●		
	Senegal	●			●		●		●	
	Tanzania	●				●				
	Uganda	●			●	●		●	●	
	Vietnam		●							
multi-country projects	BD, KE, RW, TZ, UG[3]				●					
	Central America (HN, NI)[4]	●		●	●	●		●	●	
	Kenya, Tanzania, Uganda		●							
	Mekong (KH, LA, VT)	●								
	Sub-Saharan Africa (MZ, UG, RW)								●	
	Cooking sector support and coordination (BD, GH, KE, UG)	●								
	Refugee activities (KE, ML, SO, TZ, UG)	●				●	●		●	

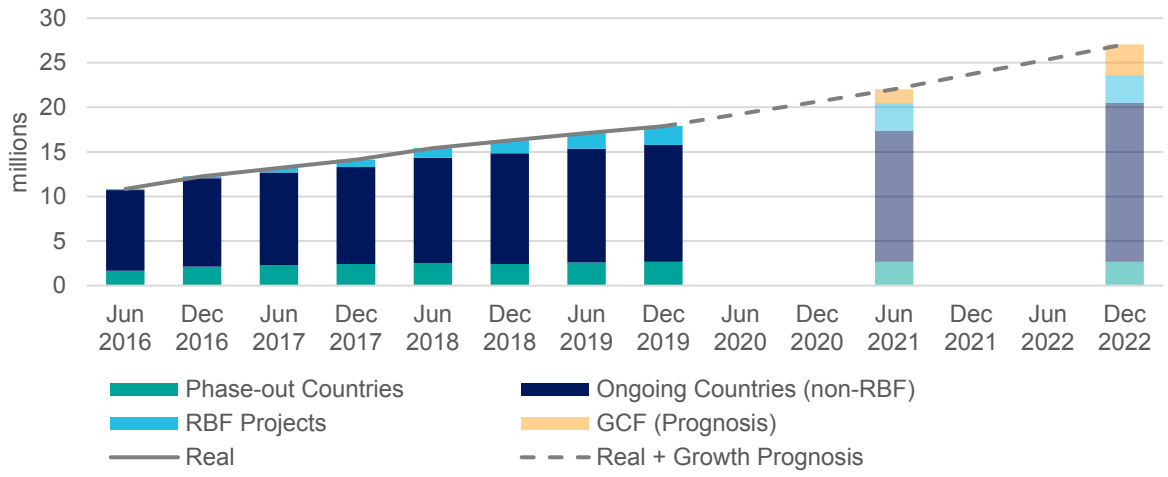
[2] Countries that ended in 2019 are shown in lighter colour
[3] focus is on off-grid appliances
[4] with some activities in Guatemala

2.2 Energising Lives: Social development

By December 2019, EnDev 2 reached 17.88 million people. In 2019 the number of people that received new access is 1.61 million which is lower than the annual growth in 2018 which was 2.12 million. One of the reasons was the reduced implementation speed related to the (re-) programming in early 2019 and the operational re-start in the second half of 2019. Figure 2-6 shows the semi-annual development of the target achievement during the last four years and draws an outlook until 2022. This is based on the planning provided by the projects for the *Annual Planning 2019 Update*. For the future an increase can be observed aiming to reach 27.1 million people in 2022. This figure includes the projections for the now starting EnDev country projects in Kenya and Senegal co-financed by the Green Climate Fund (GCF). The analysis shows that target achievement in the first half of 2019 was 270,000 people below projection which is 25% of the overall target prognosis in that period. During the second half of 2019 where operations were re-started and intensified, target achievement was only 90,000 respectively 10% below the prognosis. It is expected that the gap between projected and actual target achievement will further decrease, thus projections will become more robust and deviations will be reduced.

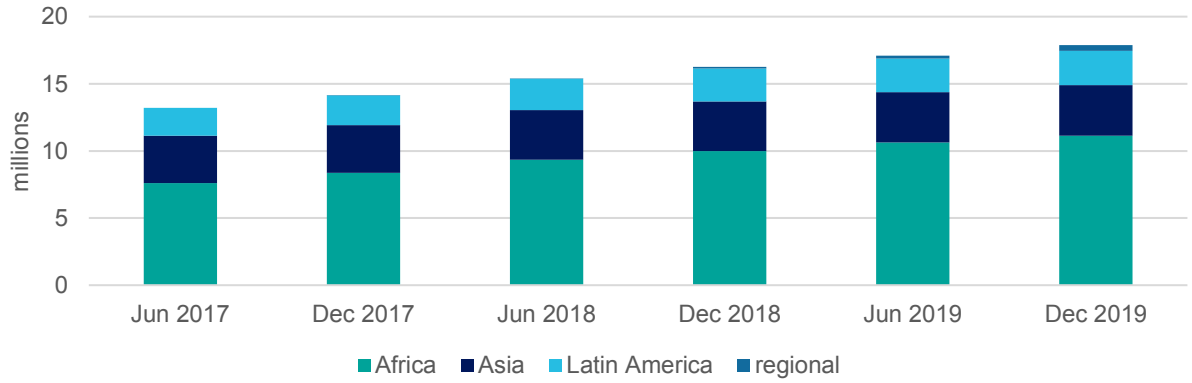
Looking only at the non-GCF prognosis one might observe that the growth in the coming three years is projected to be in the range of 5.7 million people. In terms of scale this is comparable to the growth during 2017-2019 at 5.6 million. However, it needs to be considered that this projected growth is based on a considerably lower budget of an estimated 60% in comparison to 2017-2019.
This indicates that EnDev's new global strategic ambition to break away from the linear relationship between inputs and results resonates on country level.

Figure 2-6
Results and prognosis for number of people reached – EnDev 2



During the past years, EnDev has increased its focus on sub-Saharan Africa. During 2018 and 2019, results in Africa increased on average by annually 16% while results in Latin America increased by 8% annually respectively by 3% in Asia.

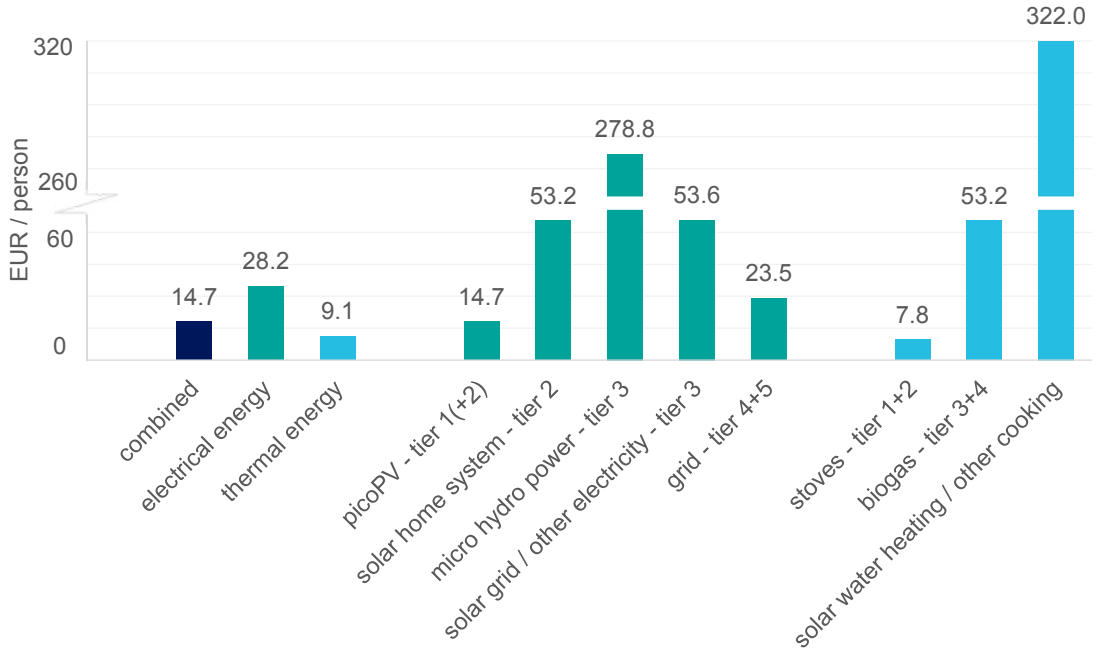
Figure 2-7
Regional distribution for number of people reached – EnDev 2



The majority of the target achievement on household level comes from access to modern cooking solutions (2019: 71%; 2018: 72%) while households with access to electricity contribute 29% (2018: 28%) to the overall target achievement (Figure 2-2). 44% (2018: 43%) of the country budgets are used for activities to promote modern cooking, 56% (2018: 57%) to promote access to electricity (Figure 2-5). Especially the sales of picoPV systems experienced the highest growth rate again. These results indicate a continuous trend that even with reduced expenditures in electricity the overall share of electricity slowly increases.

The cost efficiency to reach one person has improved slightly in 2019. While by the end of 2018 the average cost efficiency was at EUR 15.5 per person at the end of 2019 it dropped to EUR 14.7 per person (Figure 2-8). This change mainly was achieved by reduction in the electrification cost efficiency (2018: EUR 30.2 per person, 2019: EUR 28.2 per person) and a nearly constant cost efficiency for cooking efficiency (2018: EUR 9.0 per person; 2019: EUR 9.1 per person).

Figure 2-8
Cost efficiency – EnDev 2



Access to electricity

According to the multi-tier framework (MTF) for electricity access, EnDev's target achievement in electrification can be attributed as follows:

Table 2-2
Outcomes according to the MTF for electrification – EnDev 2

Tier	Typical system	Number of people	%
5	grid	836,501	16%
4	limited grid	518,224	10%
3	mini-grid	186,642	4%
2	solar home system	1,698,795	32%
1	picoPV	1,986,763	38%
	total	**5,226,926**	

Access to clean cooking

Corresponding to the multi-tier framework (MTF) for access to clean cooking and based on EnDev's methodology, EnDev's target achievement in clean cooking can be attributed as follows:

Table 2-3
Outcomes according to EnDev methodology – EnDev 2

Tier	Service level	Number of people	%
5	Access to needed quantity of energy source: ≥ very good Health protection: ≥ very high; Convenience: ≥ very high	0	0
4	Access to needed quantity of energy source: ≥ good Health protection: ≥ high; Convenience: ≥ high	201,514	1.6%
3	Access to needed quantity of energy source: ≥ fair Health protection: ≥ fair; Convenience: ≥ fair	72,281	0.6%
2	Access to needed quantity of energy source: ≥ limited Health protection: ≥ sufficient, Convenience: ≥ sufficient	6,732,138	53.2%
1	Access to needed quantity of energy source: ≥ deficient Health protection: ≥ low; Convenience: ≥ low	5,626,197	44.5%
0	Access to needed quantity of energy source: ≥ highly deficient Health protection: ≥ very low; Convenience: ≥ very low	18,073	0,1%
		12,650,203	

Indoor air quality

In most cases women are responsible for cooking and thus benefit most from improved cookstoves that emit fewer pollutants. Considering the above figure on the number of people with access to tier 2 cooking solutions and assuming that $^1/_5$ of the average household are women and $^2/_5$ are young children, it can be concluded that around 1.40 million women and 2.80 million young children benefit from lower exposure to hazardous pollutants like particulate matter and carbon monoxide.

During 2019, additional 1,035 social infrastructures (SI) received access to modern energy services. For EnDev 2, this results in a total of 19,890 social infrastructures. Similar to the development on household level the growth rate during the first half of 2019 was lower than expected, while the second half of 2019 matched the projections. Regionally, the largest contribution to SI target achievement is Latin America with 57% (in total 11,416 SI - Figure 2-10). Africa contributes 31% (in total 6,139 SI), Asia the remaining 12% (in total 2,333 SI). In electrifying SI Africa has reached 3,473 which is the biggest share in the portfolio (Figure 2-10). (Latin America 3,257 SI, Asia 1,391 SI). While so far the majority of SI is provided with thermal energy (Figure 2-10) the focus of on-going projects on electrical energy.

Figure 2-9

Results and prognosis for social infrastructure – EnDev 2

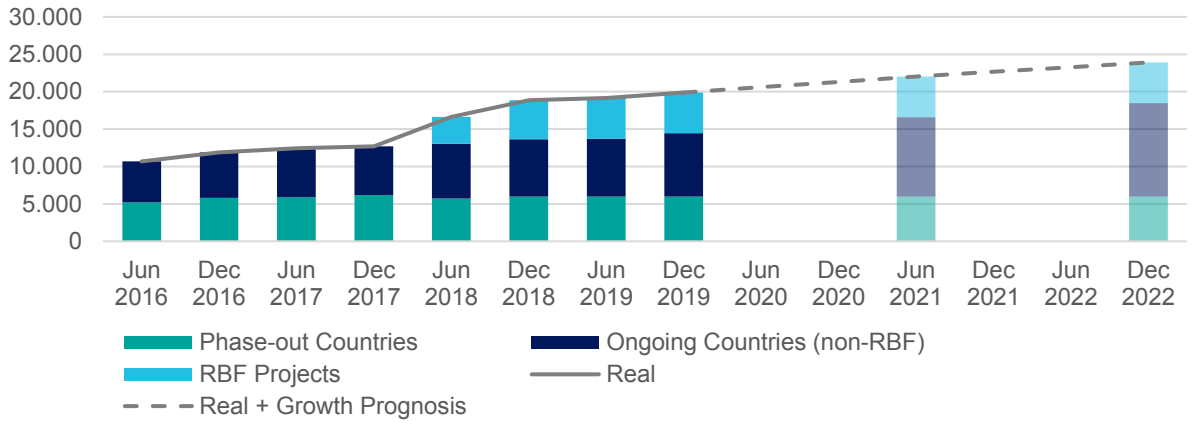
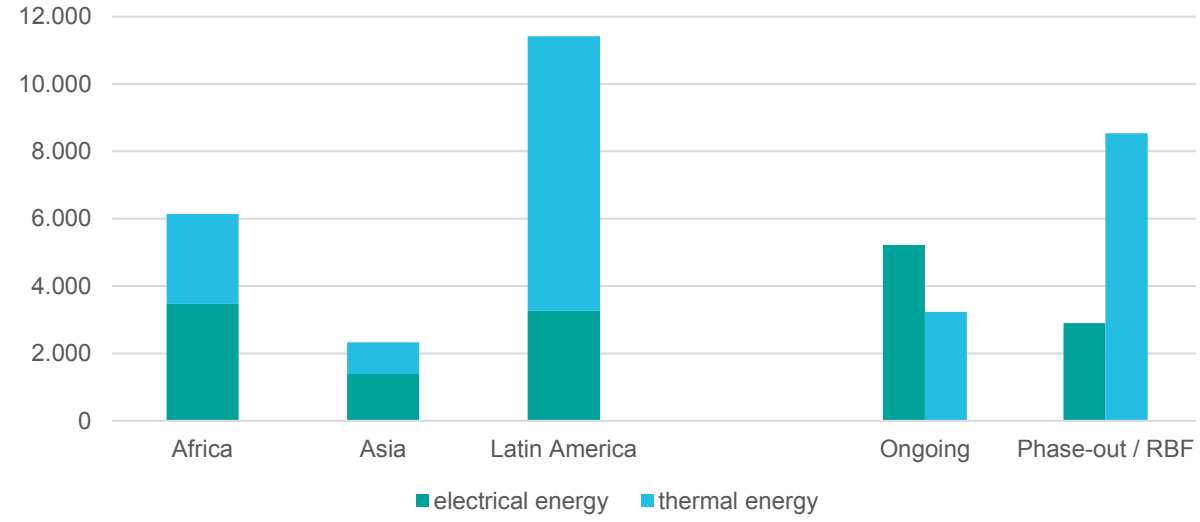


Figure 2-10

Social infrastructure by technology, region and project type – EnDev 2

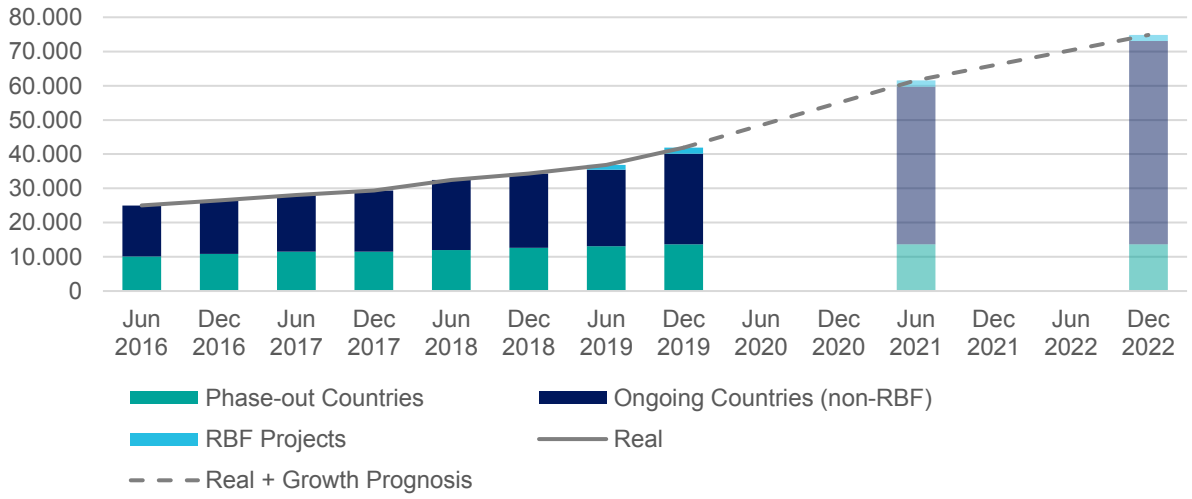


Within EnDev 2, in total 1,648 health institutions were provided with access to modern energy. This represents 8.3% of the 19,890 SI that have been supplied. Including results from EnDev 1, in total 2,000 health institutions were reached. The extrapolated global analysis shows that a majority of 72% of the health institutions are located in Africa. This corresponds to 1,430 SI.

2.3 Energising Opportunities: Economic development

Since 2005, EnDev has provided access to modern energy for 53,860 small and medium-sized enterprises (SME). During EnDev 2, the number of SME that received access is 41,900 while the share of access to electricity and access to clean cooking stands at parity. In 2019, an additional 7,615 SME received new access which is nearly as much as in 2017 and 2018 together. Similar to the development on household level and for social infrastructure the growth rate during 2019 was slightly below the projected targets even though target achievement for SME shows a positive development path in comparison to previous years. It is expected that this trajectory will continue with results almost doubling as compared to the results that were achieved in the first half of 2019. In comparison to households and social infrastructure this would be the highest expected growth rate. This indicates that EnDev's new global strategic orientation to put a stronger focus on the productive use of energy resonates on country level.

Figure 2-11
Results and prognosis for small and medium-sized enterprises – EnDev 2



Regionally, most SME have been reached in Latin America with 44%, followed by Asia with 31% and Africa with 24% respectively.

Figure 2-13 shows that all regions contribute in the same range to access to thermal energy. Access to electricity for SME so far was dominated by Latin America with 57%. The analysis of the technology mix in the ongoing projects indicates that the future portfolio will have slightly more additional results in the field of electrification of SME. Zooming in, Figure 2-14 shows that according to the current programming projects with a medium-term perspective will contribute the largest share to SME target achievement in the category "electricity access tier 3-5". This mainly relates to

commercial and industrial appliances, agricultural value chains (cooling, water pumping, solar powered irrigation, agro-processing, etc.), or more professionally operating manufacturing facilities. The 2nd largest share can also be attributed to countries with a medium-term perspective, here in the category “cooking access tier 1-2”. This mainly relates to gastronomic services such as restaurants or food stalls.

Figure 2-12
SME by region – EnDev 2

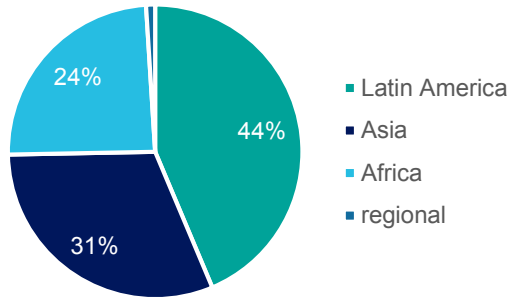


Figure 2-13
SME by technology and region – EnDev 2

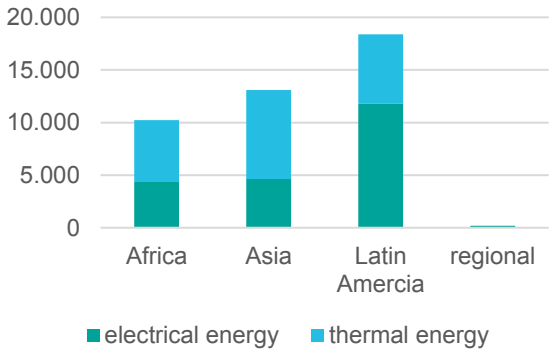
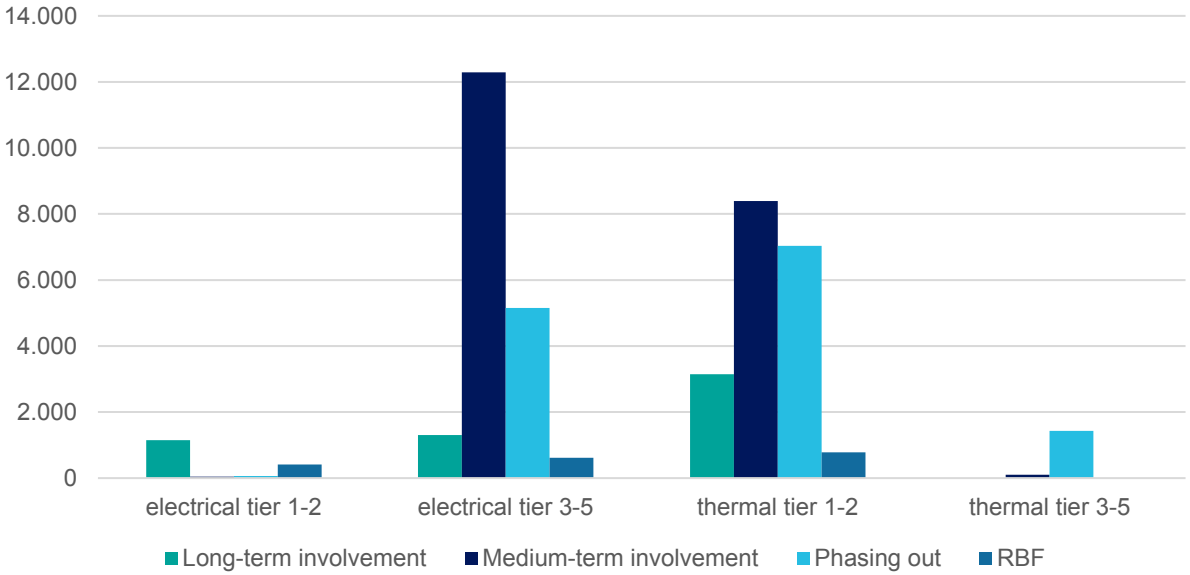


Figure 2-14
SME tier distribution – EnDev 2



Job effects show a relatively stagnant picture over the past few years. EnDev captures data at different points along the supply chain of energy technologies to analyse and model employment effects. EnDev considers effects in enterprises that are related to production and to sales as direct effects. Employment effects in the operation of mini-grids are considered a direct result, too. Additionally, EnDev models indirect employment effects that occur in enterprises which use energy technologies for productive uses.

In the considered sectors most employment effects are affecting work availability at different intensity, in general most of them are part-time jobs. For a consistent and comparable analysis, EnDev transfers the effects into full-time equivalent jobs (FTE). An FTE is based on 250 working days per year with either eight working hours (for jobs in production) or a locally decent salary per day (jobs in sales). Data on full-time equivalent jobs for 2019 is detailed in Table 2-4.

In the production of cooking energy technologies 3,244 full-time equivalent jobs existed, while 747 full-time equivalent jobs existed in the respective sales and distribution chains. These calculated results are about 5% lower in comparison to 2018. The production results reflect the slightly lower figures of stoves and biogas systems sold in 2019. For solar systems the number of full-time equivalent jobs along the distribution chain was 857. Both sales and distribution results are higher than in 2018. For picoPV this relates to the increase of sales figures (+4%). In the stove sector the increase relates to higher sales prices of the product which translates into a higher amount for salaries and hence more FTE.

During the operational phase of mini-grids 2,748 full-time equivalent jobs in operation and maintenance, administrative and managerial tasks and security services exist. Temporary jobs that exit during the construction are not considered.
Within enterprises that received access to energy it is estimated that as an indirect result of EnDev 4,190 full-time equivalent jobs exist.

In total, 11,786 full-time equivalent jobs exist in partner countries that can be attributed to EnDev. As most real jobs are part-time it is estimated that 23,572 people are employed that can be attributed to EnDev. In comparison to 2018, where 11,318 full-time equivalent jobs existed this is an increase of about 4%. However, in comparison to 2017, where 11,882 full-time equivalent jobs existed this is a decrease of slightly below 1%. Even though overall target achievement increases, it can be observed that employment effects have stabilized. EnDev will further analyze the reasons for this stabilization.

Table 2-4
Employment effects – full-time equivalent jobs

	Direct			Indirect
	Production	Distribution/sales	Operations	SME application of technologies
Cooking energy	3,244	747		
Solar lights		857		4,190
Mini-grids			2,748	
Total		**11,786**		

2.4 Energising Climate: Combating climate change

Annual savings of CO_2 emissions show a continuous growth. In 2019, 2.33 million t CO_2 were saved that can be attributed to EnDev. The overall CO_2 savings of EnDev accumulate to 14.6 million t by the end of 2019.

A breakdown of CO_2 savings per region and technology is presented in Figure 2-16. 96% of the CO_2 emission savings are achieved through cooking technologies which are mainly implemented in Africa. Regionally, a total of 84% of the CO_2 emissions saved in 2019 can be attributed to Africa (80% via thermal energy and 4% via electrical energy). In Asia and Latin America, CO_2 savings via thermal energy amount to 10% and 6% respectively. CO_2 savings via electrical energy in Asia and Latin America together are far below 1% and are thus insignificant and negligible.

Ongoing projects achieved annual CO_2 savings of 2.17 million t CO_2 which are 92% of the total annual CO_2 savings (Figure **2-16**). Based on this significant contribution by the main portfolio it is expected that the annual CO_2 savings will continue to further increase in upcoming years.

Figure 2-15
CO_2 savings – EnDev 1+2

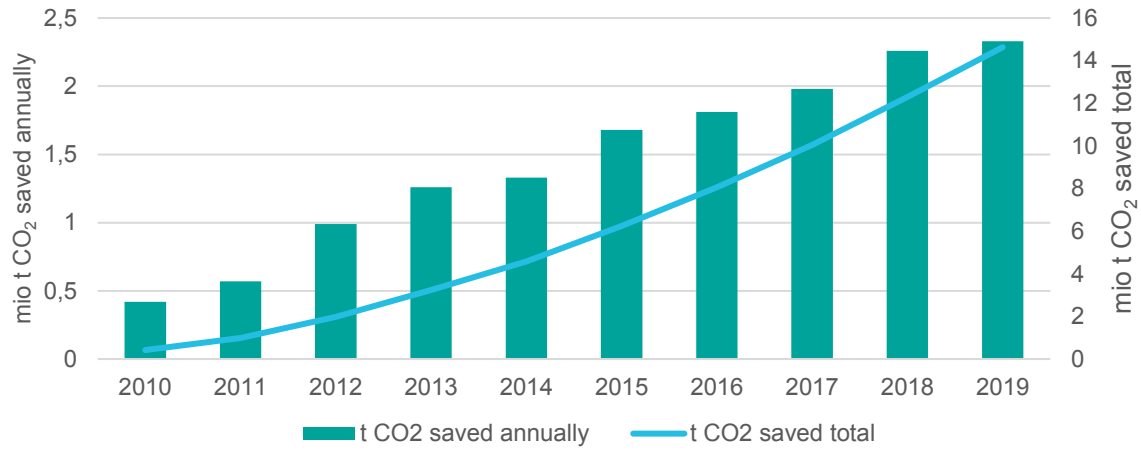
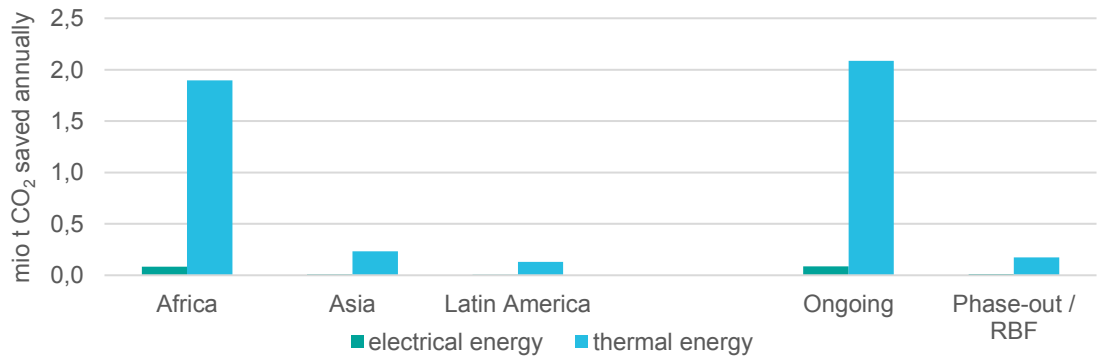


Figure 2-16
Annual CO_2 savings by technology, region and project type



Tapping new markets

Regional market development benefits companies and customers

Bich Tan Nguyen is the owner of social enterprise *SolarServe*. Founded in 2009, the company manufactures cookstoves in a workshop on the outskirts of Da Nang, a city in Northern Vietnam. An old hand in the cookstoves business, Bich's sales had been limited to his home town and its surrounding areas. This changed in 2015 when EnDev, through SNV, introduced a project to increase the availability of improved cooking devices in the Mekong region. With a virtually untapped demand for biomass cookstoves in Cambodia, Bich decided to expand his business to this emerging market. Doing business in a foreign country for the first time, and being new to cross-border trade, the learning curve was steep. To pre-finance the production of orders from Cambodia, he signed a loan at his local bank. He also adapted the stove and packaging to the Cambodian customers. In the end, all 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."

Vietnam / Cambodia

3. Partnerships

In 2019, EnDev started concerted action to grow local business heroes. EnDev continued its collaboration with global key players in energy access and deepened its network to the humanitarian sector to inject its implementation experience in contexts of refugees and forced displacement.

Following EnDev's renewed strategy, the 2019 programming cycle invited EnDev country projects to design more holistic interventions for market development. Proposals were based on sub-sector *Theories of Change* encouraging cooperation with other development partners and a broader support to the enabling environment. The involvement of the *Independent Technical Advisory Committee* (ITAC) providing input during the evaluation also brought opportunities for a broader cooperation in a number of countries. The 2020 portfolio review will assess how these broader views have found their way into the implementation, but indications are positive.

Growing local business heroes

As part of its renewed strategy, EnDev strengthens its focus on entrepreneurship in the sector, developing an approach to select and support the strongest local companies and businesses via a set of business development tools that are currently being developed in support of the EnDev country projects. At the Clean Cooking Forum in Nairobi, a first masterclass for stove producers was given in close cooperation with GET.Invest to strengthen future investment pipelines, particularly focusing on local stove production. Building on this first attempt, EnDev will further develop its set of business development support interventions.

Continued collaboration with global key players

Representatives from World Bank, Clean Cooking Alliance, and EnDev met for a strategic in-depth exchange to discuss opportunities for stronger alignment and intensified collaboration in the clean cooking sector in early 2019. It was agreed that more effective partnership and strategic leveraging of core competencies will enhance the collective impact in the clean cooking sector. This was the first of several follow-up meetings throughout the course of 2019.

A prominent announcement in 2019 was the World Bank's launch of a 500 million USD *Clean Cooking Fund* under the *Energy Sector Management Assistance Program* (ESMAP) which is geared towards accelerating progress towards universal access to clean cooking by 2030 and catalysing investments. Witnessing the World Bank moving more prominently into clean cooking is an encouraging trend and major parts of the program proposal are reflecting EnDev instruments (e.g. RBF schemes). EnDev in this context is

considered as a strategic partner, the relationship is described by ESMAP as "ESMAP is collaborating with EnDev on the MTF cooking framework, knowledge sharing, and coordination on country engagements as well as global outreach."

Cooperation with World Bank is improving steadily also on programming level. EnDev recommendations during World Bank scoping and planning missions are valued and taken into account. Planned World Bank investments in Ethiopia and Rwanda, for instance, take duly notice of EnDev's lessons and pioneering work in the countries. In Rwanda, as part of restructuring the *Scaling Up Renewable Energy Program in Low Income Countries* (SREP) World Bank intends to build on EnDev's pro-poor RBF approach. EnDev and the *Kenya Off-Grid Solar Access Project* (KOSAP) align their activities well. On global level, EnDev's input to the revised multi-tier framework (MTF) for clean cooking was well appreciated by World Bank's *Energy Sector Management Assistance Program* (ESMAP). Relevant parts of EnDev's conceptual pioneering work is now reflected in the new MTF, which integrates cooking behavior and stacking in its methodology. EnDev provided review of the World Bank's MTF diagnostic reports for Rwanda and Bangladesh. MTF Reports on additional countries, where EnDev is ready to provide input, are expected in 2020.
The Clean Cooking Forum 2019 focused on the "investable part" of the sector. Local pro-poor solutions closing the affordability gap, or less then cleanest intermediate solutions or transition pathways taking these solutions into account were only to a limited extend part of the forum. EnDev and the Clean Cooking Alliance agreed to work on a more comprehensive and integrated approach and narrative, including an active EnDev participation in the preparation of the next Clean Cooking Forum (or Investment Forum). EnDev is actively contributing to the Clean Cooking Alliance's cooking sector strategy development. To support these discussions, EnDev will pursue to further develop, substantiate and communicate its transition narrative for the cooking energy sector.

Injecting implementation experience in contexts of refugees and forced displacement

During the UN Secretary-General's *Climate Action Summit* in 2019, Filippo Grandi, High Commissioner for Refugees, noted that the vast majority of world's 71 million refugees and displaced people does not have access to sustainable energy and clean cooking. EnDev has increasingly geared attention towards this complex challenge and has broadened its cooperation with humanitarian actors, in particular on the ground. This applies to its traditional implementers participating more strongly in humanitarian coordination mechanisms at technical level like in Uganda, and raising the awareness of humanitarian organizations like UNICEF, Dorcas/ZOA, Mercy Corps and Red Cross for renewable energy and market-based approaches through cooperation between EnDev and the Dutch Coalition for Humanitarian Innovation (DCHI).

Building a broader capacity base for SDG7 and shaping innovation

EnDev initiated a joint learning agenda with its main implementing partners with the aim to more systematically collect, analyse and share the lessons and experiences on energy access approaches from the field. In this way EnDev intends to strengthen

the capacities of not only the broader set of EnDev implementing partners, but also of practitioners and public actors on the national and global levels. Specific learning themes in the current pilot approach are productive use of energy, energy in refugee settings, decentralized electrification, and behavioral change in cleaner cooking.

EnDev also intensified its support to innovations addressing themes where innovations might contribute to target achievement or where innovations might trigger new approaches beyond established “classic” intervention logics. In 2019, two themes were addressed:

- Energy for refugees through the cooperation with DCHI, linking humanitarian organizations to development actors. First results are expected mid-2020 and will feed into the broader humanitarian space.
- Energy and gender where EnDev engaged with Energia for a gender and energy innovation facility to be rolled out in 2020. Meanwhile, also the DFID funded *Modern Energy Cooking Services* program joined. Results are expected to cross-fertilize core activities of programs of involved organizations but – where appropriate – might also actively be supported to scale via other channels.

Strengthening the nexus of climate and energy access

With the new project *Promotion of climate-friendly cooking: Kenya and Senegal* with substantial funding from the Green Climate Fund (GCF) EnDev significantly expands its footprint in the climate-energy nexus. The project is effective as this report is being drafted and implementation in Senegal and Kenya is about to start. The programmatic approach of the project is designed to be transferable to further countries as well.

Ingenuity with a little help

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 up to 2,700 kilos of carrots per day. So Julio designed a machine that would make washing carrots easier. At first, the huge carrot-washing machine was powered via a household connection. This meant that the machine overheated easily, damaging its engines. EnDev provided financial and technical support to ensure that all technical specifications were correct, and that the shared investment could be carried. With a newly installed voltage transformer and electricity meter, the machine now washes an average of 41,200 kilos daily. Julio explains: "The machine works perfectly 24 hours a day. Not only does this mean that people don't have to clean carrots 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."

4. Safeguards and gender

In 2019, EnDev strengthened its methodological approach for safeguards and gender. EnDev's tailor-made approach was rolled out to all country projects during the portfolio-wide programming cycle in 2019.

Based on EnDev's portfolio review in 2018 and as part of EnDev's portfolio-wide programming cycle in early 2019, EnDev developed a tailor-made approach for safeguards and gender. This approach is based on GIZ's safeguards and gender management system which was introduced company-wide in 2016. Adaptations were made in the application and procedures to match the needs for an approach which is compatible to be used by different EnDev implementers. EnDev's safeguards and gender approach is now mandatory for all EnDev country projects and an integral part of programming. The approach is designed to take precautionary measures to avoid or mitigate unintended negative impacts in the areas of:

- environment and climate
- conflict and context sensitivity
- human rights
- gender equality

The purpose is to help EnDev country projects design their interventions as sensitive and sustainable as possible so that unintended negative impacts can be avoided or mitigated in the relevant project context.

Environment and climate

This safeguard investigates whether EnDev interventions might have adverse effects on biological diversity, ecosystems, soil, water, or air quality. It also investigates whether EnDev interventions might depend considerably on climatic parameters or on climate- and weather-related events such as droughts and floods, and whether the intervention might have negative impacts on the adaptive capacity of target groups or ecosystems.

Conflict and context sensitivity

A number of EnDev countries is affected by conflict, fragility, violence or crises. This safeguard investigates how to minimise or prevent EnDev interventions from having unintended negative impacts on fragile and conflict- or violence-prone contexts. This safeguard is linked to the rating of a country according to its escalation potential with regard to crisis and/or violent conflicts.

Human rights

This safeguard investigates whether EnDev interventions are designed in a human-rights-sensitive way, i.e. guarantee that people can lead a self-determined life in which they can enjoy freedom, equality and dignity, irrespective of their sex, age, ethnicity, religion, disability, sexual orientation, gender identity or any other social status.

Gender equality

This safeguard investigates whether EnDev interventions are gender-sensitive and how potentials for promoting gender equality are tapped. Actively promoting gender equality and women's rights is regarded as an essential element of any human-rights-based, sustainable intervention strategy.

Two-step process

EnDev's safeguards and gender approach foresees a two-step assessment to identify possible risks in each area and – where applicable – to determine preventive measures. The first step is a screening based on a checklist. If in this screening considerable risks are detected, an in-depth assessment for the specific safeguard is conducted as a second step. Checklists are submitted together with full proposals by EnDev country projects and are reviewed centrally. Any identified mandatory in-depth assessment needs to be conducted early on in implementation so that potential relevant findings which might not have been already considered in programming can be reflected in the intervention strategy at project level as early as possible.

Step 1: Screening

The screening as the first step includes reviewing and analysing information from sources that are generally accessible as well as project-specific documents. The benchmark used in the screening is the potential considerable risk of unintended negative impacts (and external risks in some cases, e.g. related to climate change). Considerable risk is assessed against the following criteria:

- **extent** of the (possible) negative impacts
- **intensity** of the (possible) negative impacts
- **frequency**, location, duration and timing of the (possible) negative impacts
- **sensitivity/vulnerability** of the affected people and objects of protection, taking into account their adaptive capacity, as appropriate
- **irreversibility** of changes
- for environment and climate safeguard: national-level **legal provisions** that classify the (possible) negative impacts of interventions as considerable

Step 2: In-depth assessment

If the screening reveals that there are potential considerable risks for one or more of the safeguards or that there are significant potentials in connection with gender equality, an in-depth assessment has to be performed for the respective safeguard(s) and/or for gender equality as a second step.

Results from roll-out

As part of the programming in early 2019, 17 EnDev country projects which were categorized for medium-term or long-term involvement were requested to conduct the safeguard and gender screening and submit assessments as part of their full proposals. These 17 EnDev country projects include three multi-country approaches, therefore comprising 22 countries in total. Six additional EnDev country projects were exempted from the process as they were already categorized for phasing out

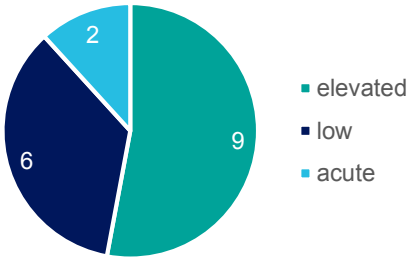
Environment and climate

In about 80 per cent of all cases, i.e. 14 EnDev country projects, the screening showed that possible threats to environment and climate issues are either not expected or possible risks are properly addressed in the intervention strategy. In three cases, EnDev country projects need to conduct in-depth assessments for this safeguard. Amongst others, reasons for the in-depth assessment are the procurement of lead-acid batteries, the promotion of solar irrigation systems, and afforestation activities and the respective possible adverse impacts of these interventions.

Conflict and context sensitivity

According to the escalation potential country matrix which is valid for EnDev and updated annually by the German Institute of Global and Area Studies (GIGA) on behalf of the German government represented by the Federal Ministry for Economic Cooperation and Development (BMZ), 65 per cent of all cases, i.e. 11 EnDev country projects, operate in contexts with elevated or acute escalation potential. Only six EnDev country projects operate in contexts with low escalation potential. EnDev country projects rated as operating in contexts with elevated or acute escalation potential need to conduct an integrated peace and conflict analysis to assess the context-sensitivity of their intervention strategies during inception phase or early on in operations.

Figure 4-1
Number of EnDev country projects according to conflict escalation potential



Human rights

Across the portfolio, i.e. in all 17 EnDev country projects, an in-depth assessment of human rights is not necessary. Even though an in-depth assessment is not necessary, in 60 per cent of all cases, i.e. 10 EnDev country projects, the screening also showed that specific questions on human rights issues should be part of integrated context and human rights analysis. Amongst others, issues to be assessed in this re-check are possible risks of unintentionally contributing to the infringement of labour rights, possible risks linked to operating in a project area in which an armed conflict is taking place with violations of international humanitarian law, and possible risks of interventions implemented in refugee settings as well as in areas where minorities of the population suffer discrimination.

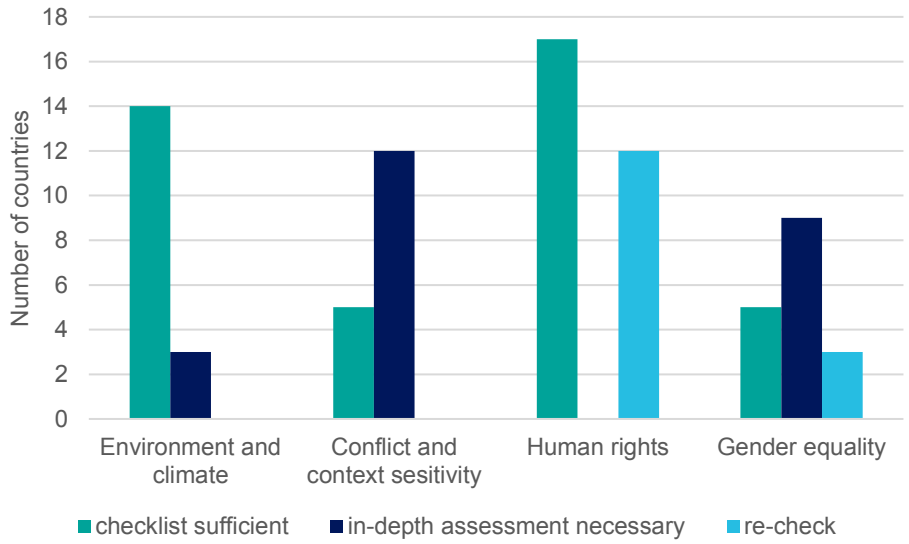
Gender equality

The screening showed that possible adverse impacts on gender equality, need to be further analysed in 70 per cent of all cases, i.e. 12 EnDev country projects. While slightly above 50 per cent of all

cases, i.e. nine EnDev country projects, need to conduct an in-depth assessment, an additional three EnDev country projects need to do a re-check on specific issues. Amongst others, issues to be analysed in an in-depth assessment or re-check are formulation of relevant but more specific gender actions, gender-related disaggregation of targets, strengthening women's owned businesses, and challenging existing gender norms through promoting female entrepreneurship

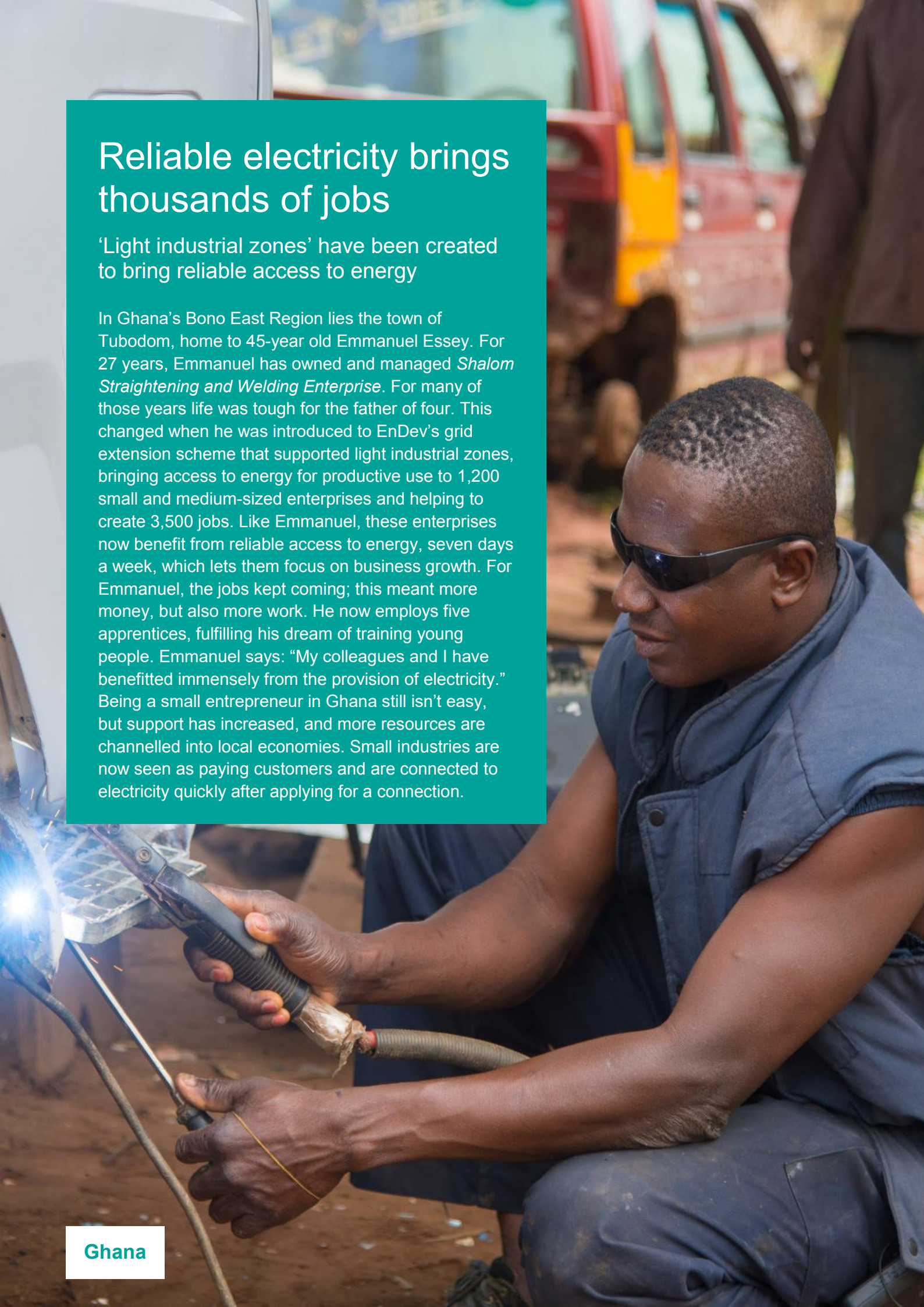
The effort to strengthen EnDev's methodological approach for safeguards and gender was timely and could be integrated well in the portfolio-wide programming cycle in 2019. On gender equality, the approach was further substantiated by the review of EnDev's *Independent Technical Advisory Committee* (ITAC) where a dedicated gender expert reviewed all 17 EnDev country projects vis-à-vis their gender-sensitivity in programming.

Figure 4-2
Safeguards



Conclusions

The need to focus capacities on (re-) intensifying program operations after the demanding portfolio review and portfolio-wide programming cycle impeded a centrally managed follow-up on safeguards and gender across the portfolio. While the process for a thorough safeguard and gender approach has now been established and all implementers have been exposed to the new methodology, a review and update of the findings – including the respective follow-up – will be conducted as part of the upcoming programming planned for late 2020 respectively early 2021.



Reliable electricity brings thousands of jobs

‘Light industrial zones’ have been created to bring reliable access to energy

In Ghana’s Bono East Region lies the town of Tubodom, home to 45-year old Emmanuel Essey. For 27 years, Emmanuel has owned and managed *Shalom Straightening and Welding Enterprise*. For many of those years life was tough for the father of four. This changed when he was introduced to EnDev’s grid extension scheme that supported light industrial zones, bringing access to energy for productive use to 1,200 small and medium-sized enterprises and helping to create 3,500 jobs. Like Emmanuel, these enterprises now benefit from reliable access to energy, seven days a week, which lets them focus on business growth. For Emmanuel, the jobs kept coming; this meant more money, but also more work. He now employs five apprentices, fulfilling his dream of training young people. Emmanuel says: “My colleagues and I have benefitted immensely from the provision of electricity.” Being a small entrepreneur in Ghana still isn’t easy, but support has increased, and more resources are channelled into local economies. Small industries are now seen as paying customers and are connected to electricity quickly after applying for a connection.

Ghana

5. Report and accounts

In 2019, EnDev secured additional funds of EUR 25.25 million with a main contribution from Norway (Norad). Further achievements in business development were the Green Climate Fund's approval of EnDev's project proposal on the promotion of climate-friendly cooking as well as the collaboration with USAID.

EnDev is looking back at a successful year in 2019 in terms of securing additional funds. In 2019, EnDev secured funds of EUR 25.25 million with a main contribution from Norway (Norad) as unearmarked joint program funding (EUR 13.84 million). New commitments also included contributions by BMZ, DEZA, ICEIDA, Irish Aid, and USAID as earmarked funding for specific countries or particular technological approaches (EUR 11.41 million). Additionally, the Netherlands (DGIS) has committed EUR 31.25 million as unearmarked joint program funds. These new contributions (EUR 56.50 million) represent 16% of EnDev 2 global budget until 2018.

In addition, 2019 brought the Green Climate Fund's (GCF) approval of EnDev's project proposal on the promotion of climate-friendly cooking in Kenya and Senegal with a total additional budget of EUR 30.57 million, thereof EUR 17.57 million by GCF (tranche 1) and EUR 12.8 million by Germany (BMZ) as so-called "own contribution". The tentative total budget of this project will amount to EUR 51.16 million (tranche 1 and 2). EnDev's GCF project budget is not included in EnDev's global budget figures. Further funds that are managed by EnDev but outside its total budget are dedicated funds of the GIZ projects "Green People's Energy" and "Energy Solutions for Displacement Settings" (EUR 9.70 million respectively EUR 5.48 million). Additionally, DGIS committed EUR 8.75 million for specific activities at the global level to be implemented directly by RVO.

EnDev's total budget sums up to EUR 382.77 million of which EUR 362.81 million have been secured. Therefore, there is currently a deliberate over-planning of EUR 19.97 million. However, there are already committed but not yet contractually fixed funds of EUR 31.25 million (DGIS). Once these funds are secured, EnDev's total budget will amount to EUR 394.06 million, including EUR 11.28 million of not yet allocated funds. In addition, approx. EUR 30.0 million are required to continue implementation in long-term and medium-term countries until the end of 2022.

Expenditures in 2019 reached EUR 33.66 million, compared to the average of the three previous years 2016-2018 (EUR 31.87 million) a slight increase of 6%. Total expenditures in 2019 reached EUR 301.29 million with EUR 81.48 million of planned expenditures remaining until the current formal end of the commissioned phase in June 2021.

Most of these funds are already operationally committed and include, amongst others, liabilities (e.g. staff contracts, service contracts, running costs),

or advance payments. Additionally, a slight tendency of back-loading by projects can be observed. Reasons are a general delay due to the re-start of operations in 2019 after the portfolio-wide (re-)programming, country-specific considerations and particular project-related implications (e.g. extension of EU-funded activities in Ethiopia, Idai-related activities in Mozambique) as well as a certain level of thriftiness at project level due to limited planning security of medium-term funding in the past.

Table 5-1
Global budget and funding of projects – EnDev 2

Allocation of EnDev 2 Total Budget [a)]	in EUR
Allocated to projects based on EnDev 2 Annual Planning 2020	346,296,014
Allocated to programme level activities	36,477,000
Total budget	382,773,014
Total available funds	362,806,730
Exceeding available funds	- 19,966,284
Committed but not yet contractually fixed funds	31,250,000
Indicative total funds	394,056,730
Remaining, not allocated funds	11,283,716

a) Annual Planning 2020 Update not included

Figure 5-1
Funds by donor

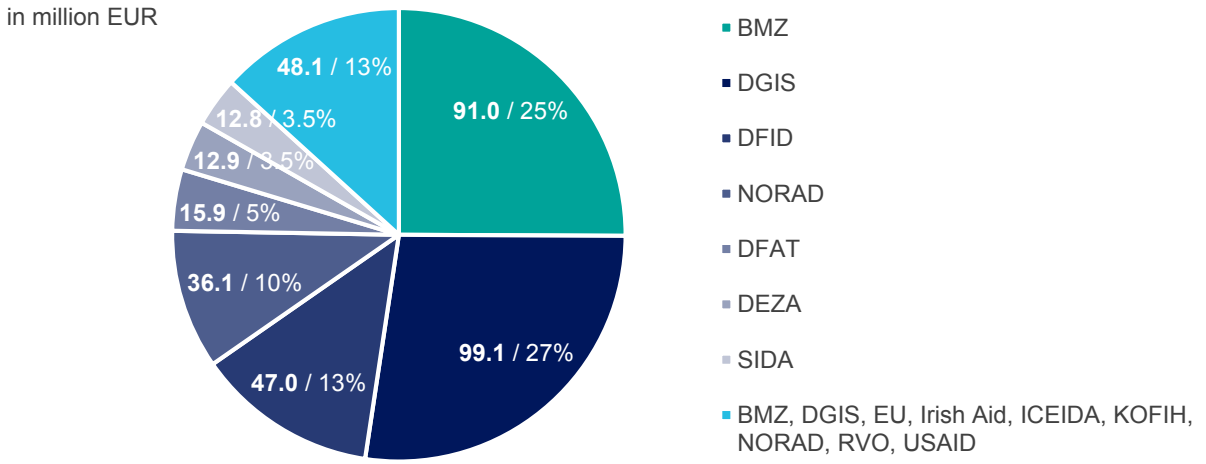
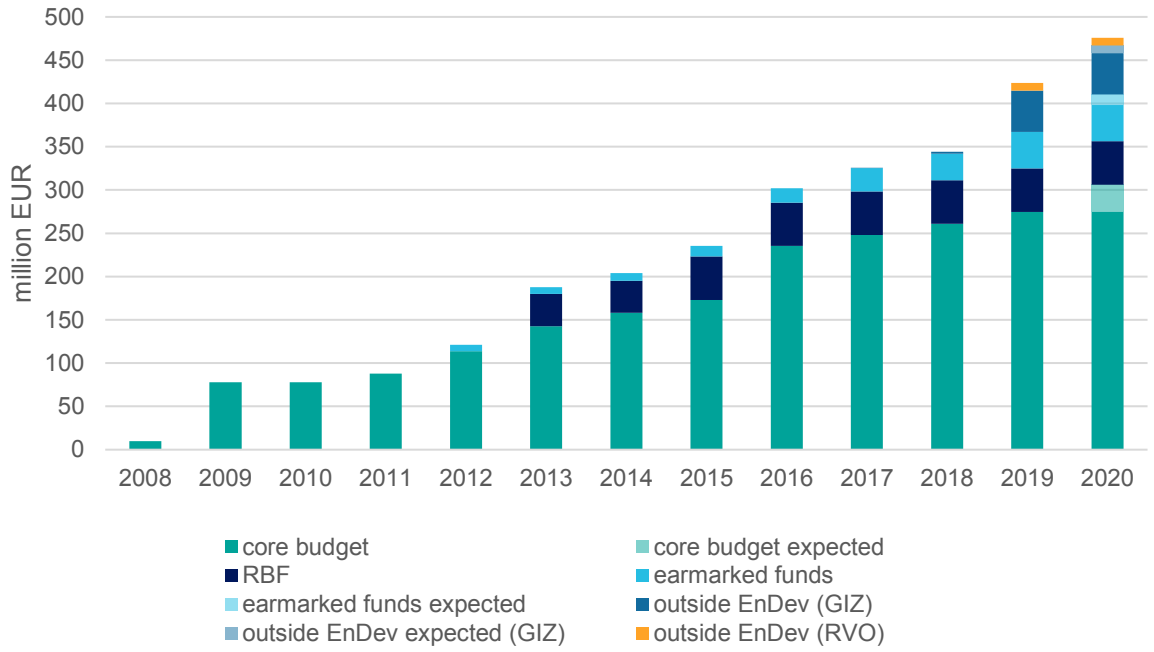
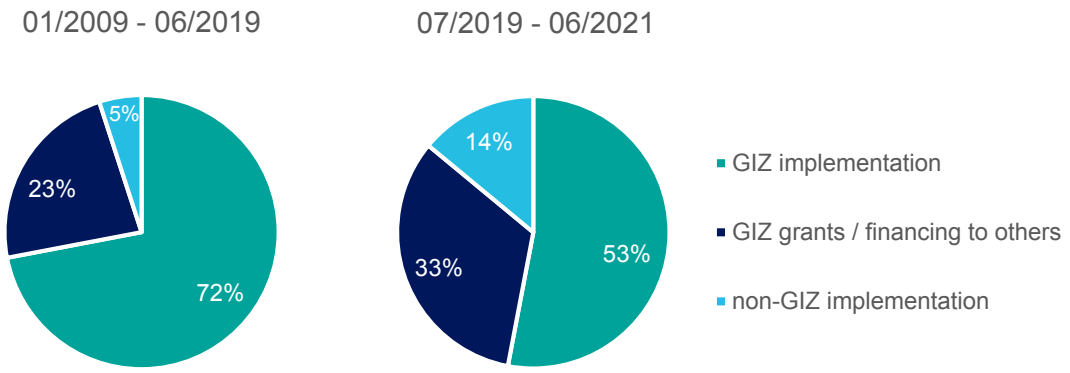


Figure 5-2
Funds by type



During the last years earmarked funds from bilateral co-financing (e.g. ICEIDA, Irish Aid, KOFIH, RVO, USAID) became a significant part of country and HQ budgets. Even donors of core funding increasingly earmark parts of their contributions (BMZ, DEZA, Norad). In 2019, only 65% of contractually fixed EnDev and EnDev-related funds did not show an earmarking. Within EnDev, 22% of funds were earmarked (12% RBF, 7% bilateral co-financings and 3% soft earmarking for technologies and/or countries), outside the EnDev budget shown in this report additional 11% of earmarked funds are to be managed by GIZ and 2% by RVO.

Figure 5-3
Funds by implementer



Until mid-2019, major parts of the available EnDev funds were implemented by GIZ directly. A significant share of funds was forwarded via financing and local subsidies to partners (national and international NGOs) which took responsibility for specific parts of the implementation such as RBF or certain technologies. Only $^{1}/_{20}$ of the funds was contracted to partners which were in charge for an EnDev country project completely without GIZ being involved directly in operations. Their contracts (grant agreements) are managed centrally as these funds are channelled via GIZ. Looking ahead, this share could increase to $^{1}/_{7}$ while funds that are forwarded to partners within projects implemented by GIZ could increase to almost $^{1}/_{3}$ of the planned budgets. Available and contractually fixed funds until end of 2019 sum up to a total of EUR 362,806,730. These funds can be divided into two main categories, program management and core funding for countries (EUR 315,806,730) and the RBF Facility (EUR 47,000,000). While within the RBF Facility EUR 362,525 have not yet been allocated, program management and core funding show an over-planning of EUR 20,328,809 with a total budget of EUR 336,135,539. Securing already committed but not yet contractually fixed funds of EUR 31.25 million (DGIS) will make EUR 11.28 million of not yet allocated funds available that will become part of the funding in the period 07/2021-12/2022.

Table 5-2
Budget excluding RBF Facility – EnDev 2

Allocation of EnDev 2 total budget [a)]	in EUR
Allocated to projects based on EnDev 2 Annual Planning 2020	300,614,539
Allocated to program level activities	35,521,000
Total budget	336,135,539
Total available funds	315,806,730
Exceeding available funds	- 20,328,809
Committed but not yet contractually fixed funds	31,250,000
Indicative total funds	347,056,730
Remaining, not allocated funds	10,921,191

Table 5-3
Budget RBF Facility – EnDev 2

Allocation of EnDev 2 RBF budget [a)]	in EUR
Allocated to projects based on EnDev 2 Annual Planning 2020	44,630,005
Evaluation	1,051,470
Knowledge and preparation budget	956,000
Remaining, not allocated funds	362,525
Total available funds	47,000,000

a) Annual Planning 2020 Update not included

5.1 Funds

Table 5-4
Funds by donor – EnDev 2

	2016	2017	2018	2019
EnDev global funds (Governing Board)				
BMZ	72,800,000	80,300,000	91,387,000	94,870,000
DGIS	100,629,138	100,629,138	100,629,138	100,629,138
DFAT	15,844,000	15,844,000	15,844,000	15,858,077 a)
MFA/Norad	28,733,000	32,833,000	32,833,000	52,455,404 a)
DEZA	7,500,000	12,650,000	13,530,000	13,530,000
DFID RBF	50,216,000	50,216,000	50,216,000	50,216,000
SIDA	14,400,000	12,774,794	12,774,794	12,774,794
EnDev additional funds (bilateral co-financing)				
EU	13,210,000	13,210,000	13,210,000	13,020,014 a)
ICEIDA				715,000 a)
Irish Aid	3,644,943	3,644,943	3,944,943	3,944,943
DFID BD	3,260,000	3,260,000	3,260,000	3,260,000
KOFIH	908,000	908,000	908,000	908,000
RVO	2,000,000	2,000,000	1,900,000	1,900,000
USAID			2,046,000	2,952,000 a)
Total	**313,145,081**	**328,269,875**	**342,965,875**	**367,033,370**

a) BMZ commission as of 12/2019 (EUR 345,965,875) including new contributions not yet commissioned (ICEIDA: EUR 715,000; Norad: EUR 19,776,000 / NOK 20.000.000; USAID: EUR 906.000 / USD 1.000.000) and exchange rate / settlement corrections to be commissioned (DFAT: EUR 14,077; EU-ProCEAO: EUR -189,986; MFA/Norad: EUR -153,596): EUR 367,033,370 Available funds for EnDev after corrections for exchange rates and closing DFID-BD: EUR 362,806,730.

Table 5-5
Funds according to BMZ commissioning, available funds, expenditures

Donor funds	EnDev 2 funds according BMZ commission [a)]	Available EnDev 2 funds [b)]	Expenditures
Governing Board donor funds			
BMZ	94,870,000	94,870,000	74,748,043
DGIS	100,629,138	100,629,138	100,915,271
MFA / Norad	52,455,404	52,455,404	34,251,685
DFAT (AusAID)	15,858,077	15,858,077	15,858,077
DFID for RBF	50,216,000	47,000,000	34,110,106
DEZA (SDC)	13,530,000	13,730,000	10,621,931
SIDA	12,774,794	12,774,794	12,869,085
Total Governing Board donor funds	**340,333,413**	**337,317,413**	**283,374,197**
Additional donor funds			
DFID for BD	3,260,000	2,049,360	2,090,783
EU for WestAfrica (ProCEAO)/SN/ET	13,020,014	13,020,014	9,569,716
ICEIDA for MW	715,000	715,000	3,716
Irish Aid for ET	3,944,943	3,944,943	3,841,812
KOFIH for ET	908,000	908,000	697,214
RVO for BD, GH, KE, UG	1,900,000	1,900,000	1,456,745
USAID for RW / Endev global	2,046,000	2,046,000	258,792
Total additional donor funding	**26,699,957**	**25,489,317**	**17,918,778**
EnDev 2 program	**367,033,370**	**362,806,730**	**301,292,975**

a) BMZ commission for project numbers 08.2139.7 / 14.2275.7 / 15.9751.7 including new contributions and corrections to be contracted (ICEIDA: EUR 715,000; Norad: EUR 19,776,000 / NOK 20.000.000; USAID: EUR 906.000 / USD 1.000.000) and exchange rate / settlement corrections to be commissioned (DFAT: EUR 14,077; EU-ProCEAO: EUR -189,986; MFA/Norad: EUR -153,596) Contributions in other currencies than EUR are fixed at current exchange rate when commissioned by BMZ. The effective amount available for EnDev depends on rates realised during encashment of funds.

b) Including additional contributions not yet commissioned by BMZ (ICEIDA, Norad, USAID) and corrections according realised and currently expected exchange rates for contracts in other currencies than EUR (DEZA, DFID, MFA/Norad, SIDA, USAID).

5.2 Expenditures

Table 5-6
Expenditures by donor

	2009-2014	2015	2016	2017	2018	2019	Total [a]
Endev global funds							
BMZ	29,632,483	16,126,509	3,227,785	7,854,510	9,957,155	7,949,601	**74,748,043**
DGIS	72,674,495	-2,194,305	10,936,217	3,938,245	5,313,423	10,247,196	**100,915,27**
DFAT	15,956,288	-825,527	727,496	4,537	-2,979	-1,739	**15,858,077**
Norad	12,180,026	10,518,938	526,236	4,524,345	4,047,629	2,454,512	**34251,686**
DFID RBF	2,736,991	3,252,762	6,638,967	8,294,270	5,505,801	7,681,316	**34,110,106**
DEZA	1,296,564	1,130,124	1,145,700	4,126,612	1,832,826	1,090,105	**10,621,931**
SIDA			5,462,077	3,195,979	3,144,727	1,066,303	**12,869,085**
Additional funds							
DFID BD		37,027	302,382	94,599	1710,788	-54,012	**2,090,783**
EU	3,031,261	2,016,132	19,971	1,008,379	-1,356,765	2,320,046	**9,569,716**
ICEIDA						3,716	**3,716**
Irish Aid	489,891	905,586	842,986	574,882	150,441	342,610	**3,841,812**
KOFIH				163,393	345,556	188,265	**697,214**
RVO			12,337	601,315	708,762	134,331	**1,456,745**
USAID					24,641	234,151	**258,792**
Total [a]	141,064,106	30,967,246	29,842,154	34,381,067	31,382,003	33,656,402	301,292,977

a) 2009-2019: Differences possible because of rounding.

Table 5-7
Funding and expenditures

EnDev	Funding	Expenditures
EnDev 2 programme total available funds	**362,806,730** [a]	**301,292,977**
Total funding according AP 2020	**382,773,014**	
Exceeding available funds	**- 19,966,284**	
Programme management and superior activities, other	**Funding**	**Expenditures**
Total	**36,477,000**	**26,001,441**
Programme mgmt., incl. DFID/DFAT prep. and Myanmar	30,433,000	22,938,682
Cofinancings EnDev-HQ [b]	3,394,000	1,456,745
Refugee Activities	1,400,000	1,051,116
Innovation Fund	1,250,000	153,106
Other (correction bookings required)		401,792
Country activities	**Funding**	**Expenditures**
Total	**266,828,000**	**204,062,219**
Bangladesh	26,416,000	24,702,803
Benin	19,599,000	15,296,843
Bolivia	17,584,000	16,080,431
Ethiopia	38,087,000	27,795,083
Indonesia biogas	3,431,000	2,768,572
Kenya	26,230,000	21,310,988
Liberia (with Sierra Leone)	7,720,000	5,993,178
Madagascar	1,289,000	1,071,656
Malawi	7,951,000	4,438,963
Mali	10,057,000	6,207,901
Mekong (Cambodia, Laos) [c]	4,163,000	2,047,240
Mozambique	21,576,000	16,495,222
Nepal	9,854,000	6,950,575
Rwanda (with Burundi, DRC)	25,061,000	16,322,693
Senegal	21,298,000	17,052,193
Tanzania	12,200,000	6,518,604
Uganda	14,043,000	11,432,451
Vietnam	4,432,000	3,624,063
Regional activities	**Funding**	**Expenditures**
Total	**15,511,000**	**7,449,958**
RBF 3: Mozambique, Rwanda, Uganda	3,283,000	49,609
RBF 3: Bangladesh, Kenya, Rwanda, Tanzania, Uganda	6,230,000	4,340,246
RBF 3: Kenya, Tanzania, Uganda	1,835,000	1,012,946
Completed activities	**Funding**	**Expenditures**
Total	**63,957,014**	**63,779,277**
Burkina Faso	6,970,000	7,017,490
Cambodia	3,150,000	2,981,641
Central America (Guatemala, Honduras, Nicaragua)	17,640,000	17,744,643
Ghana	3,845,000	3,669,222
Indonesia solar / hydropower	12,800,000	12,905,031
Mongolia	495,000	495,046
Peru	17,257,000	17,166,190

a) Available funds incl. new contributions by ICEIDA, Norad and USAID. Currently (31.12.19) commissioned by BMZ: EUR 345,965,875, new contributions 2019 and corrections not yet commissioned: EUR 21,067,495, total to be commissioned by BMZ: EUR 367,033,370

b) Harmonised Support to Clean Cooking Sectors (RVO), SIINC (DEZA), SCCIF (USAID)

c) incl. former RBF3 Mekong

Annexes

A. Country overview

Table A-1

Ongoing country and regional projects

Country	Lead political partner	Project duration		Funding (in EUR 1,000)	Planned outcomes on HH level in persons[5]
		start	end		
Bangladesh	Bangladesh Ministry of Power, Energy and Mineral Resources	06/09	12/20	26,416	3,433,500
Benin	Ministère de l'Energie	10/09	06/21	19,599	1,065,000
Bolivia	Vice-Ministry of Electricity and Alternative Energy (VMEEA) of the Ministry of Energy	10/09	06/21	17,584	591,000
Ethiopia	Ministry of Water, Irrigation and Electricity (MoWIE)	01/10	06//21	38,087	2,420,000
Kenya	Ministry of Energy	04/09	06/21	26,230	4,895,000
Liberia (with SL)	Liberia: Ministry of Mines and Energy; Sierra Leone: Ministry of Energy	05/12	06/21	7,720	85,700
Madagascar	Secrétaire Général de la Région Atsimo Andrefana	12/12	06/21	1,289	145,000
Malawi	Ministry of Natural Resources, Energy and Mining / Ministry of Gender, Children, Disability and Social Welfare (for RBF)	12/12	06/21	7,951	1,513,000
Mali	Ministry of Water and Energy	04/09	06/21	10,057	168,800
Mekong	Cambodia: Ministry of Mines and Energy (MME) Laos: Ministry of Science and Technology (MoST)	03/15	06/21	4,163	103,000
Mozambique	Ministry of Mineral Resources and Energy	10/09	06/21	21,576	tbd[6]
Nepal	Ministry of Energy, Water Resources and Irrigation	05/09	06/21	9,854	505,000

[5] Indicative target forecasts are not in all cases synchronized to the current end of the commissioned phase in 06/2021. Indicative targets might span a time horizon until end of 2022 depending on the categorization as medium-/long-term involvement countries. In these cases, indicative targets are not broken down to mid-term targets, meaning that for countries with a time horizon beyond the duration of the actually commissioned phase, target achievement might appear off while in fact this is not the case. This misleading discrepancy between the actual status and the target value vis-à-vis the remaining duration of the commissioned phase will become obsolete once the current phase is extended or the follow-on phase is commissioned.

[6] After the cyclone Idai hit Mozambique, the project's approach and geographic scope needs to be adjusted to the new situation. The project is in the process of restructuring and starting activities as a direct reaction on the cyclone

Country	Lead political partner	Project duration		Funding (in EUR 1,000)	Planned outcomes on HH level in persons[5]
		start	end		
Rwanda (with BI, DRC)	Rwanda Energy Group (REG) – Energy Development Company Limited (EDCL) / Ministry of Infrastructure (MININFRA); BI+DRC: suspended; focus on local private sector	10/09	06/21	25,061	753,000
Senegal	Ministry of Petroleum and Energy	04/09	06/21	21,298	1,800,000
Tanzania	Ministry of Energy	12/12	06/21	12,200	1,485,000
Uganda	Ministry of Energy and Mineral Development (MEMD)	04/09	06/21	14,043	915,000
RBF BD, KE, (RW,) TZ, UG	BD: Ministry of Power, Energy and Mineral Resources (MoPEMR); KE: Ministry of Energy and Petroleum; Renewable Energy Directorate; TZ: President's Office of Regional and Local Government (PO-RALG); UG: Ministry of Energy and Mineral Development (MEMD)	03/15	09/20	6,230	305,000

Table A-2
Ending and finalized projects

Country	Lead political partner	Project duration		Funding (in EUR 1,000)	Planned outcomes on HH level in persons
		start	end		
Burkina Faso	Ministry of Environment, Green Economy and Climate Change	10/09	09/19	6,970	585,600
Cambodia	Ministry of Mines and Energy	12/12	11/19	3,150[7]	14,850
Central America	Nicaragua: Ministerio de Energia y Minas (MEM) Honduras: Instituto de Conservación Forestal (ICF)	09/09	11/19	17,640	342,300
Ghana	Ministry of Energy (MOEn)	01/10	09/19	3,845	Focus on PU
Indonesia	Ministry of Energy and Mineral Resources (MEMR)	05/09	09/19	12,800	85,350
Indonesia biogas	Ministry of Energy and Mineral Resources (MEMR)	12/12	03/21	3,431	51,000
Peru	Ministry of Energy and Mines (MINEM)	06/09	06/19	17,257	1,625,200
Vietnam	Ministry of Agriculture and Rural Development (MARD)	07/13	12/20	4,432	107,700
RBF MZ, RW, UG,[8]	UG: Ministry of Energy and Mineral Development (MEMD) MZ: Ministry of Mineral Resources and Energy; RW: Ministry of Finance and Economic Planning (MINECOFIN)	03/15	12/19	3,283	165,000
RBF KE, TZ, UG[9]	KE: Ministry of Energy and Petroleum; Renewable Energy Directorate; TZ: President's Office of Regional and Local Government (PO-RALG); UG: Ministry of Energy and Mineral Development (MEMD)	03/15	12/19	1,835	24,500

7 Transitional funding also to cover continuation of stove components in Cambodia and prospectively in Laos.
8 Regional RBF Sub-Saharan Africa: In December 2019, DFID approved the extension of the project until February 2020. The extension will be officially announced in the Annual Planning 2020 Update
9 Regional RBF Kenya, Tanzania, Uganda: In December 2019, DFID approved the extension of the project until March 2020. The extension will be officially announced in the Annual Planning 2020 Update

Table A-3

Management and thematic activities

	Country / Region	Project duration		Funding (in EUR 1,000)
		start	end	
Head office	Programme mgmt., incl. DFAT prep. and Myanmar	01/09	06/21	28,426
Head office	Conceptual developing and piloting (DEZA, USAID)	08/18	12/20	1,494
RBF preparation		08/12	12/20	956
RBF evaluation		08/12	12/20	1,051
Cooking Sector support		05/16	03/19	1,900
Innovation Fund	Bangladesh, Madagascar, Mali, Mozambique	11/18	11/20	1,250
Refugees	Kenya - stoves, picoPV	11/17	09/19	650
	Somalia - grid, solar street light	06/17	02/19	350
	Uganda (Norad) - stoves, picoPV	10/18	12/19	100
	Uganda (RVO) - stoves, picoPV	11/17	12/19	300

Table A-4
Additional thematic activities

	Country / Region	Project duration		Funding (in EUR 1,000)
		start	end	
Refugees	Tanzania - stoves, picoPV	01/18	12/20	1,600
	Uganda (DFID) - stoves, picoPV (energy kiosks)	10/17	06/18	277
	Uganda (SIF) -	08/19	10/22	3,200
	Kenya (SIF) -	01/15	12/22	19,000
	Ethiopia (SIF) -	11/19	10/22	2,300

B. Overview of results

Table B-1 and Table B-2 provide an overview of the main quantitative results presented in this report and the results achieved at the end of 2018. The tables allow an easy attribution of results to the respective project phases.

Table B-1
Overview results

		EnDev 2		EnDev 1+2	
		2019	2018	2019	2018
People with access [in mio]	People with access	17.88	16.27	22.89	21.28
	People with access to thermal energy	12.65	11.62	16.84	15.81
	People with access to electrical energy	5.23	4.65	6.05	5.47
	Additional people per year	1.61	2.12		
	Women with reduced exposure to IAP	1.4	1.3		
	Children with reduced exposure to IAP	2.8	2.6		
Social institutions	SI with access	19,890	18,854	27,390	26,355
	Schools			18,059	17,400
	Health centers	1,648	1,569	2,000	1,921
	Additional SI per year	1,035	6,157		
SME	SME with access	41,900	34,285	53,860	46,245
	Additional SME per year	7,615	4,929		
EUR/person	Cost efficiency thermal energy	9.1	9.0		
	Cost efficiency electrical energy	28.2	30.2		
	Cost efficiency combined	14.7	15.5		

Table B-2
Climate and employment results

		only 2019	only 2018
Employment Effects	FTE cooking energy technologies production	3,244	3,264
	FTE cooking energy technology distribution	747	711
	FTE solar system distribution	857	780
	FTE mini-grid operation	2,748	2,748
	FTE in SME	4,190	3,429
	Total FTE	11,768	11,318
	People in employment	23,536	22,636
Climate [in mio t]	Annual t CO_2 savings all technologies (EnDev 1+2)	2.3	2.3
	t CO_2 saved total (EnDev 1+2)	14.6	12.3
	Annual t CO_2 savings ongoing projects	2.17	

C. Monitoring and verification

EnDev is an outcome-oriented programme and therefore places a strong emphasis on quantifying results. This is achieved by EnDev's transparent annual monitoring following a strict monitoring methodology.

EnDev's reporting is conservative and has a higher chance to underestimate than to overestimate outcomes. From experience, EnDev has learnt that raw data does not correctly represent the entire picture. For instance, not all access created will be sustainable or there might be cases where beneficiaries already had access to modern energy services (i.e., household buys stove but already possesses efficient baseline technology). Therefore, EnDev applies adjustment factors, collectively referred to attribution, additionality and sustainability to raw outcome data before figures are reported. The three factors are determined by various sub-factors.

The outcomes of individual EnDev country projects are defined as the number of people or social institutions or small and medium-sized enterprises that gained sustainable access to modern energy services. Both electricity and thermal energy contribute to the objective of energy access. Should households, social institutions or small and medium-sized enterprises be supported in both electricity and thermal energy they are nevertheless only counted once in the overall outcome figure.

Statistic data is used to determine household size from which the number of beneficiaries reached is derived. Household sizes vary between countries or even within a country. A specific household size is associated with each EnDev country project or even within regions/districts in which the project is operating. A household size of five persons is used as default value if no national statistics or EnDev-conducted studies are available.

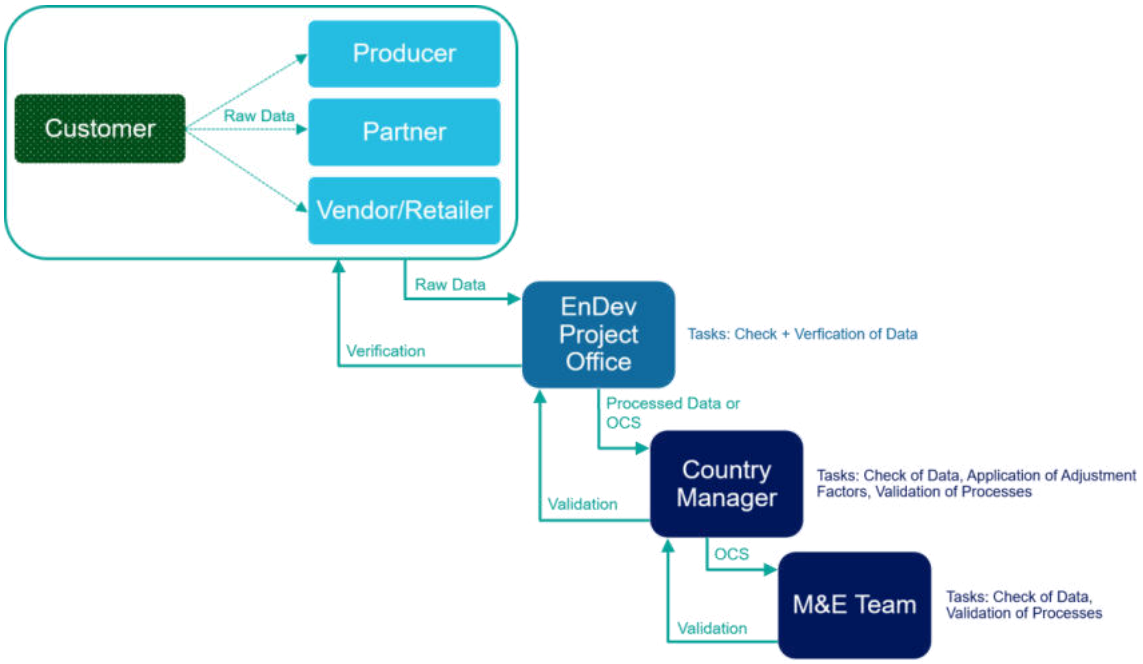
Figure C-1 describes EnDev's monitoring cycle and how high-quality data is ensured through validation and verification measures.

Raw data is collected on beneficiary level. If possible, monitoring is embedded in local partner structures. Depending on the type of partner, data may be collected in different ways: for example, as lists of electricity customers, sales reports, or lists of beneficiaries provided by NGOs or local governments. Data is collected either through implementing partners, by consultants, or by EnDev staff.

After raw data is collected, verification, the comparison of submitted data with the reality on the ground is conducted. EnDev country teams conduct a consistency and plausibility check before submitting the data to global level. Here, it is validated by country backstoppers who, in turn, pass the data on to EnDev's global monitoring team where two rounds of validation are conducted. Verification and validation play a key role, as it:

- increases reliability and traceability of data
- increases transparency
- puts a strong focus on delivering high quality data in the first place

Figure C-1
Process for monitoring, verification, and validation



In 2019, country-specific verification procedures were cross-checked to assess whether issues such as independency, sample sizing, and traceability are thoroughly addressed. The cross-check showed that in the majority of all cases basic verification procedures are in place. Not in all cases documentation was up to the requirements and it will therefore be followed up in 2020 to check whether this was simply a lack of documentation of whether there are methodological weaknesses.

Three key conclusions could be drawn from the assessment of the verification procedures.

- There is general awareness for the importance of verification and besides the mandatory control mechanism it is also seen as an insightful source to gain additional information on usage or functionality of the respective technology, consumer behavior, etc.
- Knowledge about verification methodologies and process design varies amongst EnDev country projects.
- Verification procedures as well as the documentation of verification results are not systematically documented across the portfolio.

Based on these findings, an updated verification guideline will be developed including good practices for further guidance of EnDev country projects. In the future, verification procedures need to be documented in a standard format. In addition, EnDev country projects need to document their verification results also in a standardized format which needs to be submitted annually to EnDev's global monitoring team, providing an additional level of validation.

D. Country project status

D.1 Ongoing projects - status

- Bangladesh
- Benin
- Bolivia
- Ethiopia
- Indonesia Biogas
- Kenya
- Liberia
- Madagascar
- Malawi
- Mali
- Mekong
- Mozambique
- Nepal
- Rwanda (with activities in Burundi and DRC)
- Senegal
- Tanzania
- Uganda
- Vietnam
- Regional RBF: Bangladesh and East Africa

Legend for access graphs in Chapter D:

Bangladesh

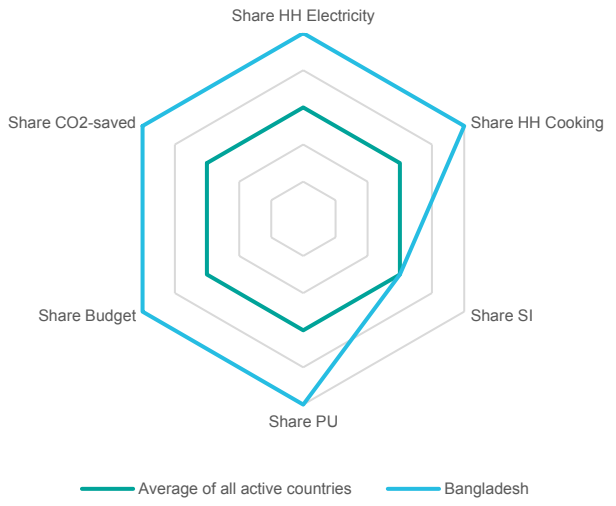
Country Facts

Population	161.4 million
Human Development Index	135 ↑ | Total (0.62)
UN Classification	LDC
Access Clean Cooking	19.0 %
Access Electricity	88.0 %

Project Facts

Project Period	06.2009 - 12.2020
Budget	EUR 26,416,000
Core Funding incl. RBF	EUR 23,266,000
Earmarked	EUR 3,150,000
Average Annual Turnover	EUR 2,205,944
Implementing Organisation	GIZ
Lead Political Partner	Bangladesh Ministry of Power, Energy and Mineral Resources

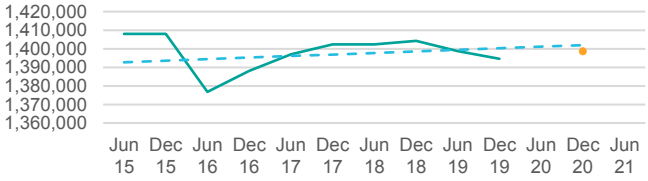
Relevance



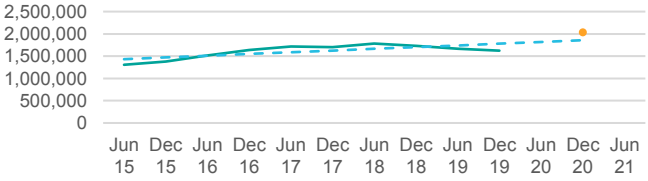
Project Results

	Targets	Achieved
HH Access Electricity	1,398,500	1,394,637
HH Access Cooking	2,035,000	1,624,501
SI Access	960	942
PU Access	10,800	6,935

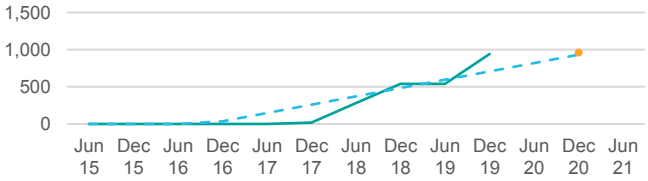
HH Access Electricity



HH Access Cooking



SI Access



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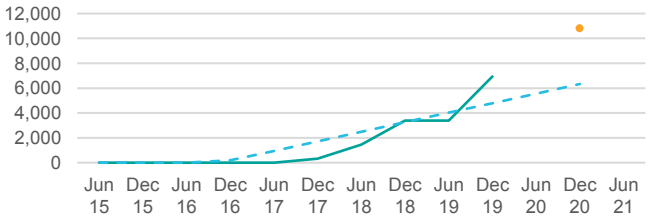


1,500 trained ‘Bondhu Chula doctors’ provide maintenance and after sales services

Bondhu chula doctor Hasina Khatun at work: cleaning of an ICS including the chimney © BBF

Background Information

EnDev Bangladesh supports the provision of efficient and clean cooking through improved cookstoves (ICS) and higher energy density processed biomass fuels for all target groups (HHs, SMEs, and SIs). In addition, EnDev is working on incorporating e-mobility aspects into swarm grid operations. Working with various partner organizations, the program has also supported the capacity development of the Sustainable and Renewable Energy Development Authority (SREDA), the Government’s nodal agency for energy access promotion. The engagement and support to the national Household Energy Platform, a cross-sectoral coordination forum for all stakeholders involved in the cookstove sector, has been continued.

Project Progress during Monitoring Period

The dissemination of one of the local ICS, the so-called ‘Bondhu Chula’ (BC), was accelerated by Bangladesh Bondhu Foundation (BBF). From July to December 2019, a total of 286,777 domestic and 17,874 commercial ICS were installed. BBF conducted training for 1,500 ‘Bondhu Chula doctors’ to install ICS, to provide maintenance and after sales services. EnDev supported BBF in the areas of business development, marketing and diversification.
PA and SNV worked on capacity development of local partners for production and marketing of briquettes from waste materials, with a focus on the exploitation of processed faecal sludge. Production of briquettes has started, a market study was scoped and the policy dialogue on national level continued.
The program continued support to SREDA in its efforts to revise the Country Action Plan (CAP) for clean cookstoves and has provided feedback to draft versions of the document, stressing the continued bridging role for ICS, as well as the importance of e-cooking as an emerging solution.
Finally, SOLShare continued implementing the Innovation Fund project “Stimulating indigenous growth through rural-based solar rickshaw charging points from SWARM grids”. The focus was on lab development and testing work for hardware and software components, with roll-out to piloting sites planned for the early part of 2020.

Hasina Khatun – portrait of a Bondhu Chula “Doctor”

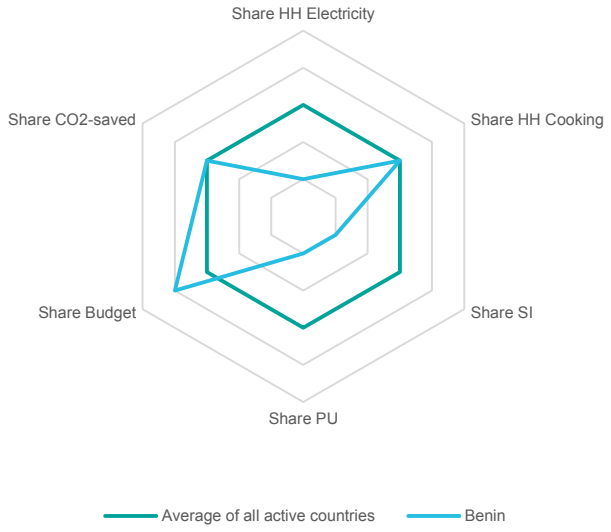
Hasina Khatun lives with her husband in Agordari, a village in Satkhira district. She is 45 and has two daughters. Her husband works as a day labourer in the field, as she did earlier. For the wedding of their daughters, they took a loan of 600 € from neighbours, which they couldn’t pay back.
Two years ago, Hasina bought a Bondhu Chula (BC) stove. Then, around 10 months ago, BBF’s Assistant District Manager informed her about a new initiative to engage BC “Doctors”. These community members would be self-employed and provide stove services. BBF, with EnDev support, would provide training as well as the necessary equipment.
The prospect of becoming a stove “Doctor” looked promising, and after training Hasina started working in 2 villages in early 2019. One main responsibility is to clean the chimneys regularly (once a month). For this, she receives 20-30 € cents. She explains how to use the stove properly, does small repairs, and also installs new stoves for a 1 Euro fee.
At first, not all households paid regularly, but over time, they learned to appreciate her services and were willing to pay. Over the last 8 months, she has installed more than 200 BCs, increasing the total number in her work area from 300 to 500.
On average, she now monthly earns 150 €. Hasina feels proud that she has already repaid the loan. Besides her income, she has earned social recognition.

Benin

Country Facts	
Population	11.5 million
Human Development Index	163 ↑ | Total (0.52)
UN Classification	LDC
Access Clean Cooking	6.0 %
Access Electricity	43.1 %

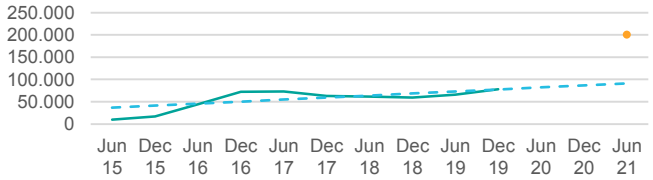
Project Facts	
Project Period	10.2009 - 06.2021
Budget	EUR 19,599,000
Core Funding incl. RBF	EUR 19,599,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 1,938,841
Implementing Organisation	GIZ
Lead Political Partner	Ministère de l´Energie

Relevance

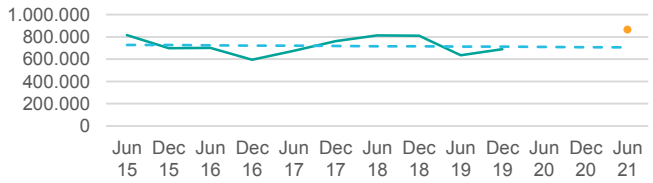


Project Results	Targets	Achieved
HH Access Electricity	200,000	78,148
HH Access Cooking	865,000	688,832
SI Access	225	194
PU Access	10,800	149

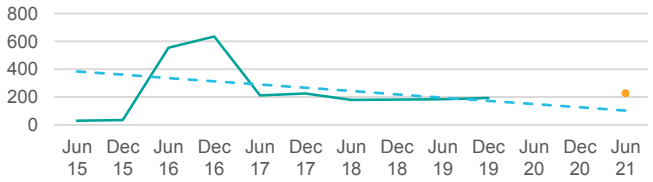
HH Access Electricity



HH Access Cooking



SI Access



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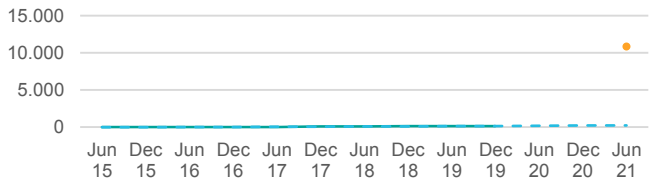


Women empowerment in the ICS value chain


© Junior Amouzou, GIZ

Background Information

During the period 2014-2019, EnDev Benin supported the development of the solar market (solar lamps, small solar home systems, customised solar home systems, solar water pumps and street lights) through RBF incentives, and the strengthening of the organisational capacity of ICS players. For the new phase 2019-2021, the solar activities will focus entirely on the household-solar market with RBF incentives and technical assistance. The electrification of social institutions and SMEs will be transferred to the new ”Green Peoples Energy” initiative. The cooking energy component will focus on the professionalization of key actors along the ICS value chain for households, SMEs and social infrastructures.

Project Progress during Monitoring Period

By end 2019, EnDev Benin facilitated access to modern energy services for about 770,437 people in the whole country. The cooking energy and off grid solar projects contribute respectively to about 89% and 11% of the overall result. Additionally, 252 SMEs and 318 SIs gained access to electricity or cooking energy.
The DFID-funded RBF off-grid solar project closed at the end of September 2019 in Benin, with companies able to submit claims up to July. The total amount of incentives requested surpassed the available budget by almost EUR 440,000. The project overachieved its targets in terms of numbers of beneficiaries, SMEs and SIs.
The cooking energy project laid out the set of strategies and action plans to be rolled out over the period 2020 - 2022, while concentrating efforts in the consolidation of the production and distribution capacities of fifteen selected semi-industrial production units all over the country. Related to this the overall target achievement on household level increased slightly by 8% compared to last semester. The project also strengthen its partnership with the national cookstove testing facility to improve stoves design, and with the Ministry of Energy to develop national standards.

Women empowerment in the ICS value chain

Mrs MINTEHOUE is a widow with six daughters. With her small income as independent ceramic jars producer, she carried the everyday life of her family with great difficulty. Benefiting since 2014 from the performance based technical assistance from EnDev Benin, she is now an essential actor of the ICS value chains in the South of Benin. As leader of one of the largest local cooperatives, she helps the business to succeed and grow. Her monthly income increased up to EUR 120, allowing her to provide education for her daughters and grandchildren.
The project´s women empowerment approach has contributed to strengthen women’s wellbeing and is now implemented in other regions in Benin.

RBF Benin

Lifting up three Offgrid PV market segments to the next level

The RBF project ended in September 2019.
From 2014 to 2019, four technologies were supported by the project: solar lamps, solar home systems (SHS), solar water pumps and solar streetlights (only from 2014-2016). In total, 55,444 lamps, 3,421 SHS, 276 pumps and 740 streetlights were supported Given an incentive budget of EUR 1.8 million, the largest share of incentives (36%) was disbursed for sales of SHS, followed by solar lamps (31%) and solar water pumps (22%).
In total, 31 companies participated in the RBF project, while five of the 31 companies consumed more than 55% of the incentive budget. The fact that the demand for incentives was greater than the incentive budget, underlines the success of the project. Companies that have not been able to receive incentives for their sales will be able to submit their claims in the next phase of the RBF project, which has been mainstreamed into EnDev Benin's solar component and will be financed through EnDev core funding. The amount of the outstanding incentives is estimated at EUR 440,000 for 10,304 solar lamps, 362 SHS and 32 solar water pumps.
During the past two years, due to the arrival of foreign firms to Benin, a remarkable increase in the supply of solar products was visible, followed by new financing options for end-user customers such as PAYGo models. The initial sales forecasts for solar water pumping systems have been greatly exceeded. The RBF approach embedded the concept of external verification of solar systems in the Beninese market, which increased the quality of installations and allowed a neutral processing of claims.
The RBF project thus undoubtedly contributed to the development of a commercial solar market in Benin.

RBF Learning Points

The RBF approach has fostered the establishment of a solar market in Benin by incentivising private sector companies to expand their business and outreach. Notwithstanding, to reach sustainability, such an approach should be accompanied by additional measures in order to guarantee access to finance in the long term, minimise the non-recovery cases of payments in instalments (PAYGO), and also minimise the generation of electrical waste at the end of the lifespan of batteries and other solar system components.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	192,000	170,361
Number of social institutions	140	223
Number of SME	100	143
EUR per beneficiary	14.79	16.44
CO_2e avoided	47,312	19,174
EUR per t CO_2e avoided	60,03	146,03
Private sector leverage ratio	1.8	1.9
Jobs created	30	128
Jobs created thereof women	6	46
Enterprises created/upgraded	15	19
Technologies deployed	68,000 household solar systems 125 solar pumps	58,865 household solar systems 276 solar pumps

Bolivia

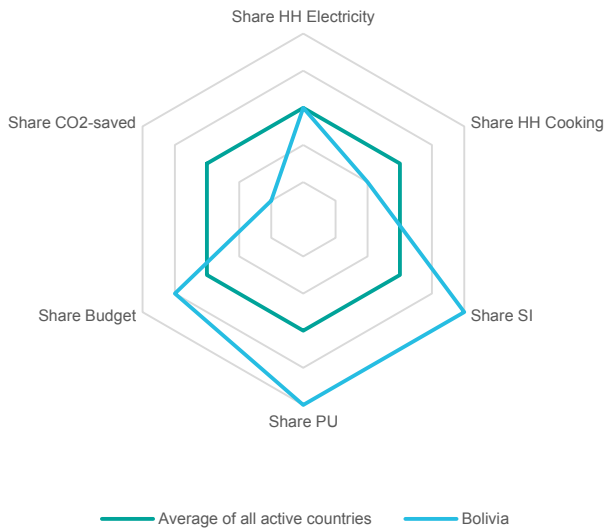
Country Facts

Population	11.4 million
Human Development Index	114 ↑ | Total (0.71)
UN Classification	LLDC
Access Clean Cooking	83.0 %
Access Electricity	91.8 %

Project Facts

Project Period	10.2009 – 06.2021
Budget	EUR 17,584,000
Core Funding incl. RBF	EUR 17,584,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 975,182
Implementing Organisation	GIZ
Lead Political Partner	Vice-Ministry of Electricity and Alternative Energy (VMEEA) of the Ministry of Energy

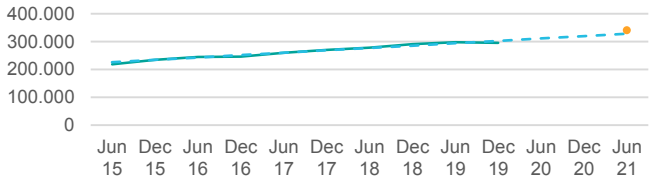
Relevance



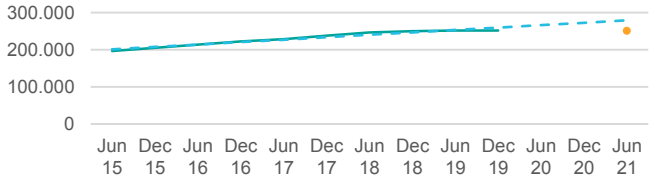
Project Results

	Targets	Achieved
HH Access Electricity	340,000	295,469
HH Access Cooking	251,000	251,326
SI Access	2,400	2,398
PU Access	11,500	8,634

HH Access Electricity



HH Access Cooking



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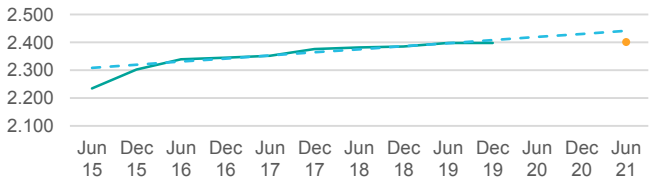

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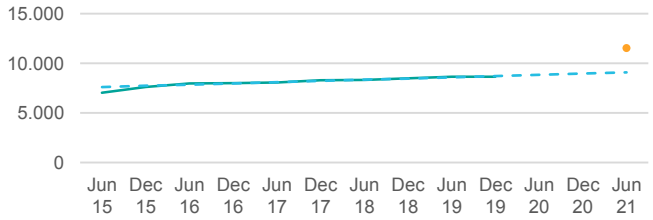


Fund approach takes up speed

Solar coffee bean dryer in a community in Caranavi, La Paz

Background Information

The Organization of American States (OAS) alleged irregularities in the electoral process of the national elections held in October 2019. President Evo Morales and other high-level government representatives resigned, and the country entered a phase of social and political unrest strongly affecting public and private sector as well civil society. The EnDev project was forced to put implementation on hold to ensure security of own staff as well as partners and contractors. This has significantly influenced the progress made in the 2nd half of 2019. In addition, monitoring and verification of results has been hindered by mobility restrictions due to the security situation.

Project Progress during Monitoring Period

EnDev Bolivia focused on preparing the implementation of the upscaling proposal approved for the period 07/2019 – 06/2021. Key elements are fostering synergies between technical components and establishing new partnerships. One highlight being the future cooperation with Practical Action (PA) in the field of productive use of energy. The objective is to bring together EnDev´s energy access expertise with PA's knowledge about supporting producers and producer associations to access markets and work along value chains, e.g. on coffee and other agricultural products.

Despite the tense situation in the country, the Fund for Sustainable Access to Renewable Energies (FASERTe) completed the implementation of its first round consisting of four projects implemented by the private sector to dynamize market development for solar and productive use technologies.

In December 2019, the situation in Bolivia stabilized, and EnDev seeks to catch up with the original timeframe planned. Nevertheless, timely results reporting for this monitoring cycle was not feasible and all results will be reported with the Progress Report 2020.

FASERTe taking up speed

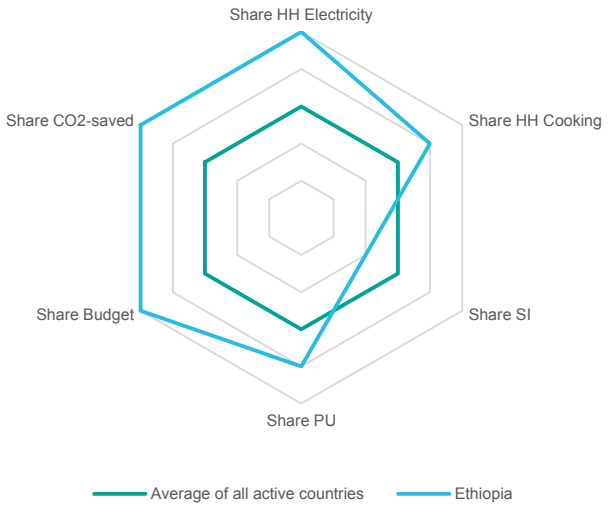
The Inter-American Institute for Cooperation on Agriculture (IICA – Bolivia) established the Fund for Sustainable Access to Renewable Energies (FASERTe) supported by EnDev. It is structured as a basket fund open to absorb funding from other sources in future.
FASERTe works towards developing a sustainable market for renewable energy and access to energy efficient technologies targeting rural households, social infrastructure and SMEs.
The first funding round resulted in more than 800 energy products being sold - varying from picoPV and SHS, solar stoves, water pumps, dryers, water heaters and cooling systems, among others.
Interested companies had to present their business ideas in a "Shark Tank" interview - out of six ideas, four were selected.
FASERTe´s success is creating momentum with five commercial banks who are now intersted in financially contributing to the fund.
Overall initial results are encouraging. Financing of the 2nd round of projects through FASERTe is expected for the 1st quarter 2020.

Ethiopia

Country Facts	
Population	109.2 million
Human Development Index	173 ↑ | Total (0.47)
UN Classification	LDC / LLDC
Access Clean Cooking	< 5.0 %
Access Electricity	44.3 %

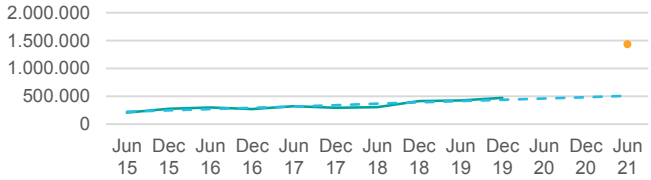
Project Facts	
Project Period	10.2010 - 06.2021
Budget	EUR 38,087,000
Core Funding incl. RBF	EUR 21,063,542
Earmarked	EUR 17,023,458
Average Annual Turnover	EUR 3,551,779
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Water, Irrigation and Electricity (MoWIE)

Relevance

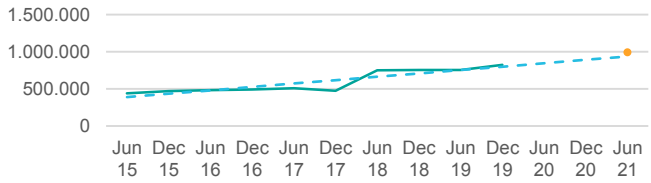


Project Results	Targets	Achieved
HH Access Electricity	1,430,000	467,041
HH Access Cooking	990,000	821,472
SI Access	1,750	770
PU Access	6,850	2,525

HH Access Electricity



HH Access Cooking



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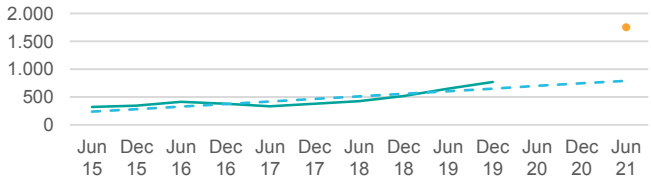

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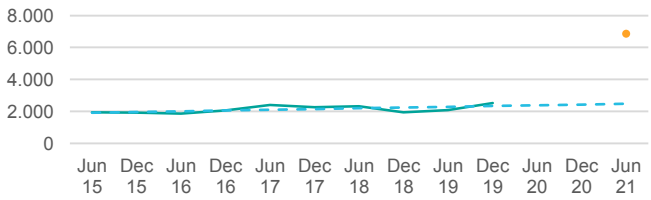


Cleaner cooking for Ethiopia's public institutions

Photos by: GIZ/Dawit Dagnew

Background Information

EnDev Ethiopia supports the private sector to create sustainable energy access for households, institutions and small businesses in off-grid areas. Co-financed by the EU, Irish Aid and Korea, EnDev aims to establish self-sustaining markets for modern energy supply based on three types of services: energy-efficient cookstoves, solar photovoltaic systems and mini-grids.

Project Progress during Monitoring Period

Operational planning for the next EnDev engagement period was concluded in November 2019 for all programme components. Following the motto "Many partners, but one team and one objective", the aim was to create cooperation and alignment between major sector stakeholders. The partner ministry MoWIE and its sub-national structures were closely involved in the process.
A baseline assessment and roadmap for a new EnDev programme component - improving the lifecycle management of lead-acid batteries in Ethiopia - was developed, finalized and validated by key stakeholders. This also included an inception and validation workshop with public-private and academic stakeholders who are now informed about critical issues around lead-acid battery handling in Ethiopia. Gap assessment studies were conducted for 'semi-industrial production system' and 'sector associations', in both the off-grid solar and improved cookstoves sub-sectors. The studies identified support packages to be delivered by EnDev to the associations and private sector service providers to strengthen their capacities. A study on the financing sector is still ongoing and is expected to identify interventions that would strengthen the promotion of consumer financing products for investment in improved energy technologies. An information database was developed and handed over to the regional energy ministry bureaus. The digital database solution is expected to allow the public partners to track dissemination of off-grid energy technologies in their region. Not only will this aid the tracking of off-grid electrification targets, but also give partners a tool to promote endorsed/certified energy products and combat the proliferation of sub-standard quality products. In the IrishAid-funded intervention, six machines for the production of renewable fuel briquets were installed in the SNNP region and training provided. As the IrishAid co-financed programme component concludes by the end of 2019, a final evaluation study was conducted.

Cleaner cooking for institutions

Debre Berhan University is a public university located in the Amhara region, some 130 km north of the capital city Addis Ababa. More than 11,000 students regularly attend its campus. Until 2012, the university was using open fires to prepare meals for the students. According to Asheber Mulugeta, a student canteen manager, "we used to spend a large portion of the cafeteria budget on firewood. The kitchens were full of smoke. This made everyone's eyes water, and it was difficult to breathe. There had also been accidents when the large cooking pots toppled over.'' This changed when the university installed EnDev promoted institutional improved cookstoves. Cooking also used to be considered a women's job. Now, Belachew Tefera and some 20 other men cook in the campus kitchens. The university operates 120 injera bread baking ovens, and 56 'Institutional Rocket Stoves (IRS)' that hold large pots of up to 200 litres. In September 2019, the university replaced all of the IRS as they had worn out, and is also in the process of replacing the 120 baking stoves. The ICS save up to 50% fuelwood and reduce the negative health effects from the smoke, creating better working conditions for the 196 university catering staff.

Indonesia Biogas

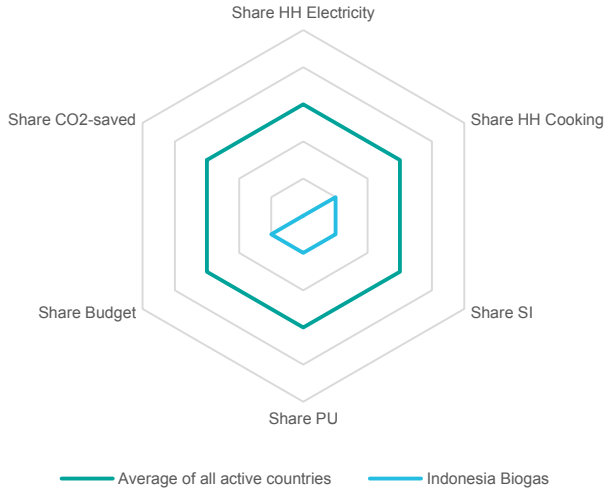
Country Facts

Population	267.7 million
Human Development Index	111 ↑ | Total (0.71)
UN Classification	
Access Clean Cooking	65.0 %
Access Electricity	98.1 %

Project Facts

Project Period	12.2012 - 06.2021
Budget	EUR 3,431,000
Core Funding incl. RBF	EUR 3,431,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 463,021
Implementing Organisation	Hivos
Lead Political Partner	Ministry of Energy and Mineral Resources (MEMR)

Relevance

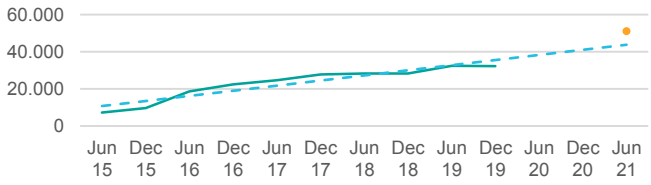


Project Results

	Targets	Achieved
HH Access Electricity	0.0	0.0
HH Access Cooking	51,000	32,255
SI Access	1	0.0
PU Access	100	99

HH Access Electricity

HH Access Cooking



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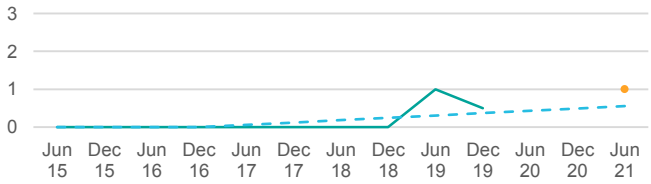

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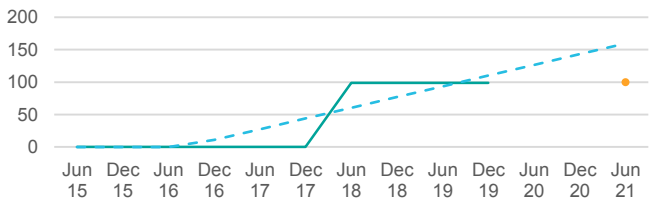


A modern, clean kitchen through the use of a biogas stove

Mrs. Rosmiyati - a biogas user in South Sulawesi Province @copyright by: YRE 2019

Background Information

This 1.5 years Phasing-Out Period (PoP) focuses on preparing the Indonesian domestic biogas sector for the withdrawal of ODA by strengthening and hand-over to local biogas foundation named YRE, developing the entrepreneurial skills and capacity of biogas SMEs, preparing the market for the phase-out of subsidies, and strengthening the enabling environment. The focus is mainly in five provinces with the strongest demand and highest performing biogas SMEs. On the supply side, biogas SMEs will be incentivised to promote biogas on commercial terms, and supported to develop improved services and financial resilience. The enabling environment will also be developed through the establishment of public and private sector partnerships and policy advocacy.

Project Progress during Monitoring Period

For the semester of July to December 2019, the EnDev supported Indonesian domestic biogas programme (IDBP) has constructed 316 biogas units in the five focus provinces of the PoP: Central Java, D.I. Yogyakarta, East Java, West Nusa Tenggara, South Sulawesi. In total, 500 units were constructed in ten provinces where IDBP operates. However, this figure is considerably low compared to 4,500 units to be achieved by the end of 2020. The challenge was mostly due to the changing political landscape in government funding support also changing commitment from the new officials of local government. Onwards, IDBP committed to accelerate the progress for achieving the remaining target by intensifying the promotional activities & fundraising effort, and conducting close-monitoring on the progress and follow-ups to be made by the provincial team. During this semester, eight constructed units are from the newly-introduced PE (Poly-ethylene) model of 2m³ 'Biomiru' launched in 2019. The eight units show that Biomiru is accepted by the market as well as benefiting, since they can function as demo units to the potential market in respective areas: the local government, micro-finance institutions, private companies, and most importantly the farmers; hence, leveraging the market penetration of the new product.

One milestone needs to be achieved within the PoP period is the establishment and the incubation program for four Biogas Service Center, which not only would provide after-sales service for biogas construction and its appliances, but would also play a significant role as the market-driver. In this semester, scoping and identification process of potential CPOs had been conducted, which resulted to the selection of four CPOs from four provinces, who will be receiving a series of capacity building programs to strengthen their business from biogas sector.

Collaboration of IDBP and the Indonesia National Standards Agency for new standard (SNI) of 'Low Pressure Biogas'

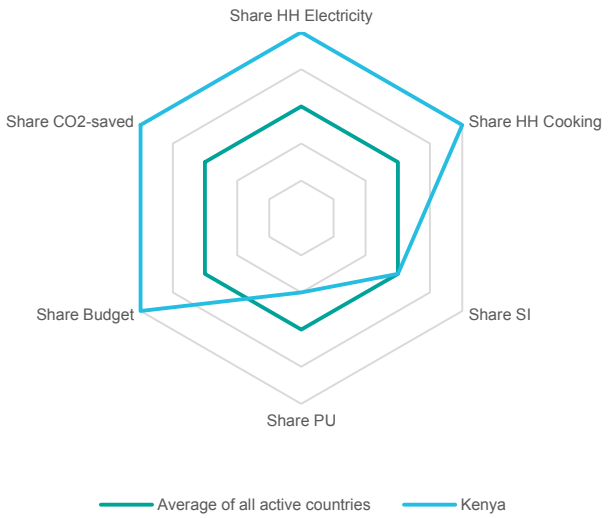
In order to strengthen the market penetration of 'Biomiru' model, IDBP is working closely with Badan Stardardisasi Nasional (Indonesia National Standards Agency) for the development of new standard to acknowledge as well as to register the newly-introduced 2m³ PE model. For the fixed-dome model, IDBP has obtained two SNI registration: SNI 7826: 2012 and SNI 7927: 2013. The development of the standard and the registration of the model is very crucial as it would be very significant to accelerate the adoption of the model. In addition, the SNI registration - along with the requirements - will become a reference for Indonesian government in conducting the procurement of low-pressure biogas project. During the 1st semester of PoP, a series of activities had been conducted to initiate the work, including one FGD in December 2019 involving MEMR and other related parties to start discussing on the draft development. IDBP aims for the SNI of Biomiru to be finalized by 2020.

Kenya

Country Facts	
Population	51.4 million
Human Development Index	147 ↓ | Total (0.58)
UN Classification	
Access Clean Cooking	14.0 %
Access Electricity	63.8 %

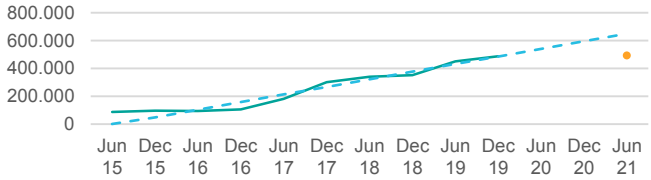
Project Facts	
Project Period	04.2009 - 06.2021
Budget	EUR 26,230,000
Core Funding incl. RBF	EUR 26,230,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 3,159,556
Implementing Organisation	GIZ+SNV
Lead Political Partner	Ministry of Energy

Relevance

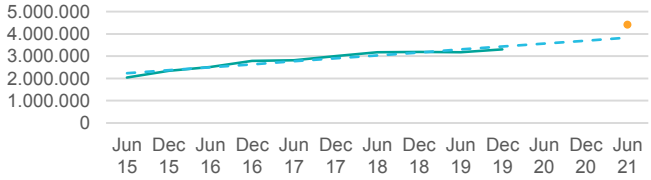


Project Results	Targets	Achieved
HH Access Electricity	490,000	485,488
HH Access Cooking	4,405,000	3,298,322
SI Access	3,000	903
PU Access	7,750	905

HH Access Electricity



HH Access Cooking



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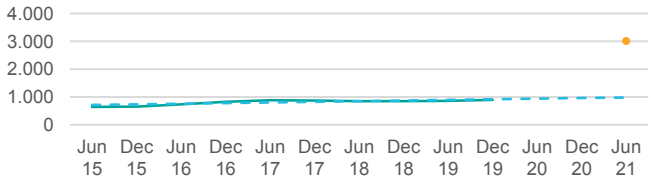

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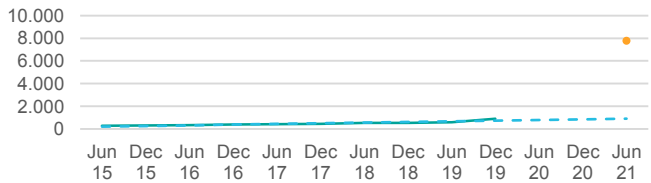


Kenyan government committed to achieving universal access to clean cooking by 2028

Professional Kenyan ICS production center © EnDev Kenya

Background Information

EnDev Kenya, implemented by GIZ and SNV, continues to promote access to modern energy solutions via private sector entrepreneurs, focusing on improved cookstoves, small solar home systems and solar hybrid mini-grids. In the new phase of the project, the cooking component shifts focus to industrially produced stoves and clean fuel stoves, but also continues with stoves for social institutions and productive use. The solar component also shifts focus to solar for productive use of energy (PUE). A new fuel component has started, which explores interventions for sustainable biomass fuel supply including pellets and briquettes. Practical Action and the Clean Cooking Association of Kenya (CCAK) are new implementing partners.

Project Progress during Monitoring Period

The number of people reached with improved HH ICS is constantly slightly increasing. With the commissioning of the GCF project, end of 2019, this growth in sales and adoption of locally produced HH stoves shall be further accelerated. The cooking component of EnDev therefore changes as described above. The RBF incentive for industrially produced stoves is decreasing and slowly phasing out. Alternative biomass fuels like pellets and briquettes as well as support for biomass fuel supply chains are being explored. This shall enhance the availability of biomass fuels (firewood, renewable charcoal as well as pellets and briquettes).
In the solar component sales per semester continue to increase at are currently at about 240.000 people. The solar for productive activities initially start with solar powered irrigation for small scale farmers.
Two RBF projects ended in the reporting cycle: picoPV RBF (September 2019) and Stoves RBF (December 2019).
Closure reports are under development for both projects. The solar hybrid-mini-grid RBF project was extended to March 2020.
The Clean Cooking Alliance held the last Clean Cooking Forum in Nairobi in November 2019. Prominently during the opening ceremony, the Kenya Cooking Sector Study was launched by the Energy Minister. The forum was attended by EnDev teams from HQ and different countries.

Stove producers mission to Uganda

A learning mission to Uganda was organized by EnDev Kenya for the eight best performing stove producers. The main objective of this mission was exposure of Kenyan stove producers to the Uganda experiences with mechanization of production processes. In addition, the mission facilitated the exchange between the Kenyan Ugandan producers regarding the state of their stove businesses and particularly with regards to formalisation and professionalisation of businesses.

The key observations and lessons learned by the Kenyan team included
(a) Mechanisation of some key stove production processes enhances production capacity and consistency of quality.
(b) Organised distribution channels boost the sales.
c) Importance of registering stove businesses as formal enterprises.
(d) Focus on value addition at stove production centres in Uganda i.e. production of stove components as well as complete stoves.

RBF Kenya picoPV

Building sustainable and affordable credit lines for small solar systems (picoPV) in rural areas in Kenya

A total of 31 private sector companies were participating in the project. Out of these, 22 were still active at the end of the project period, six had dropped out due to non-performance, one had voluntarily exited the project and one had achieved the maximum threshold of the incentives and therefore successfully exited before the project ended.

By the end of the project, the cumulative verified and incentivized sales stand at 272,177 solar products, equivalent to 181% of the project's performance target. The total amount of verified and disbursed incentives to a total of 27 private sector companies stands at EUR 2,865,248, equivalent to 100% of the total allocated incentive budget.
In August and September 2019, the final verification cycle took place and covered solar products sold by private sector companies participating in the RBF project until July 2019.

The project came to an end on September 30th, 2019. The RBF project will be part of the Market Transformation Study, an RBF Impact Study and the finale evaluation of the RBF Facility. Field visits by the evaluators are scheduled for Q1 & Q2 of 2020.

RBF Learning Points

The market barriers identified by the project beneficiaries participating in the project are generally of the same nature: insufficient distribution networks and partners, high cost of distribution, uncertain purchasing capacity of households in targeted regions, etc.

However, the impact of these barriers on these companies differs depending on the business growth stage.

The smaller less established players and new entrants to the market often require more resources than the larger, more established companies to mitigate the business barriers and achieve the same results. The design of RBF incentives should therefore be tailored to motivate business transformation for companies at different stages of business development and corporate strength.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	700,000	1,260,851
Number of SME	0	389
EUR per beneficiary	5.50	2.85
CO_2e avoided	27,594	50,233
EUR per t CO_2e avoided	139.42	71.61
Private sector leverage ratio	4.90	10.90
Jobs created	2,000	1560
Jobs created thereof women	600	456
Enterprises created/upgraded	8	29
Technologies deployed	700,000	1,260,851

RBF Kenya Mini-grids

Market creation for private sector operated mini-grids in Kenya

During the reporting period, construction and commissioning of eight mini-grids was completed, bringing the total number of RBF supported mini-grids in Kenya to ten. The independent verification of five commissioned mini-grids resulted in the disbursement of incentives amounting to EUR 590,523 to mini-grid developers. This brings the cumulative amount of incentives paid so far to EUR 733,121.

In Turkana County, two mini-grids are serving both refugees and host communities: Kalobeyei Host Community Town and Kalobeyei Settlement Village 1. The Kalobeyei Settlement mini-grid is currently serving more than 290 households, 120 small-and medium sized enterprises and thirteen social institutions.

Construction of three additional mini-grids by one developer started but stalled due to significant delays in accessing finance. An extension of three months has been granted to the developer to complete the construction and commissioning of the mini-grids. In addition, one project developer could not secure the approval from local authorities for one of the planned mini-grid sites in Marsabit County and therefore, the development of this specific site will not be realised under the RBF project.

The project was extended to end of March 2020, which required a cost neutral extension of the grant agreement with the fund manager Barclays Bank of Kenya.

RBF Learning Points

Sustainability of private sector operated mini-grids: Data from operating mini-grids show a low utilization with consumption rates for some mini-grids with less than 10% of the generated electricity. This underlines the need for promotion of productive use of electricity in off-grid villages to ensure sustainability for the villages but also for the private sector in future.

Access to project finance: Local private sector companies (and especially start-ups) face challenges in raising capital and hence delay in project implementation. The assumption that the companies' participation in the RBF project, would help and facilitate access to finance, seems not to hold. Some companies still had problems accessing loans to cover their upfront costs.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	7,000	3,915
Number of social institutions	0	19
Number of SME	0	191
EUR per beneficiary	296.43	340.84
CO_2e avoided	1,835	1,026
EUR per t CO_2e avoided	1,130.80	1,300.19
Private sector leverage ratio	0.30	0.80
Jobs created	60	0
Jobs created thereof women	12	0
Enterprises created/upgraded	5	3
Technologies deployed	14	10

RBF Kenya Cookstove

The Kenya Higher Tier Clean Cookstove Market Acceleration Project

Through the project implementation period, the project has enrolled a total of 35 RBF beneficiaries, including not-for-profit organizations, stoves manufacturing companies, stoves distributors and microfinance institutions. Out of the total 35, 23 organizations were still active at the end of the project period, while twelve had been removed from the project due to non- performance.

Between October and December 2019, the final verification was undertaken for a total of 52,381 stoves sold in the reporting period. These sales bring the cumulative number to 110,807 stoves sold in the entire project period, equivalent to 111% of the project's target. A total of EUR 945,670 has been paid out to RBF beneficiaries over the entire project implementation period, representing 98% incentives fund disbursement.

The project was able to surpass its target, but unfortunately, the available incentive budget could not cover all verified sale claims submitted by beneficiaries. Incentives were pro-rated for the period January 2019 to December 2019 to ensure fairness in terms of incentives payment.

The project came to an end on December 31st, 2019.

RBF Learning Points

Financial institutions (FI) are not the main drivers for sales of higher tier stoves: A thorough analysis of the value chain actors is important in deciding who is likely to have more impact. FIs and Micro Finance Institutions (MFIs) were expected to deliver greater results, but they failed since their core business did not fully align with the stove promotion business. Instead, for stoves distributors and manufacturers this was their core business and therefore, they were able to deliver more results under the intervention.

Tailoring the RBF incentive structure to the different segments of stove companies is crucial: Besides allocating incentives based on the technology tier (as it was implemented in this project), incentives could also target the various players in the supply chain based on the stages of organizational growth and the potential to promote more stoves. A one size fits all approach does not work for all the players in the supply chain for higher tier stoves.

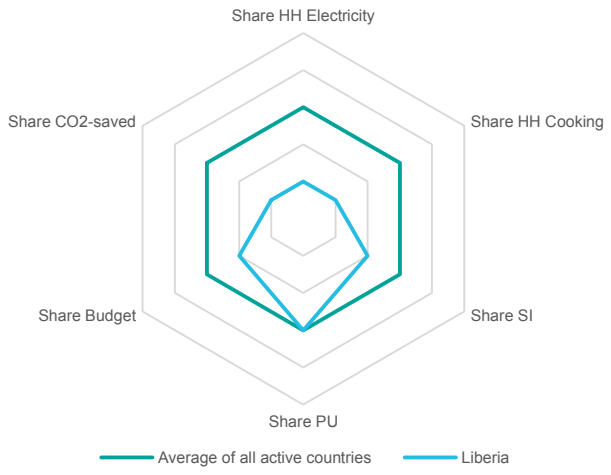
RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	500,000	554,035
EUR per beneficiary	4.12	1.57
CO_2e avoided	168,090	196,749
EUR per t CO_2e avoided	50.01	4.42
Private sector leverage ratio	1.7	5.5
Jobs created	100	1,031
Jobs created thereof women	60	486
Enterprises created/upgraded	10	24
Technologies deployed	500,000	554,035

Liberia

Country Facts	
Population	4.8 million
Human Development Index	176 ↑ | Total (0.47)
UN Classification	LDC
Access Clean Cooking	< 5 %
Access Electricity	21.5 %

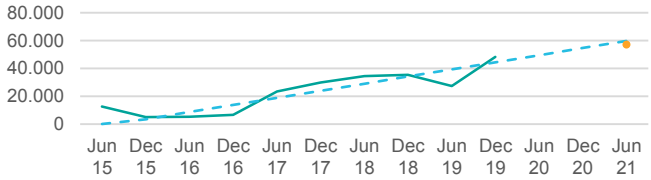
Project Facts	
Project Period	05.2012 - 06.2021
Budget	EUR 7,720,000
Core Funding incl. RBF	EUR 7,720,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 1,026,729
Implementing Organisation	GIZ
Lead Political Partner	Liberia: Ministry of Mines and Energy Sierra Leone: Ministry of Energy

Relevance

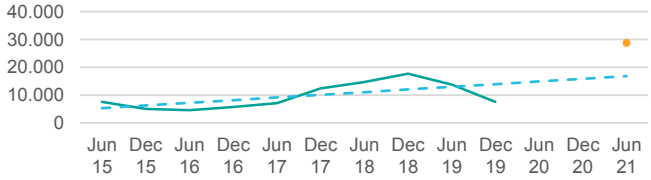


Project Results	Targets	Achieved
HH Access Electricity	57,000	48,092
HH Access Cooking	28,700	7,598
SI Access	935	445
PU Access	1,520	1,605

HH Access Electricity



HH Access Cooking



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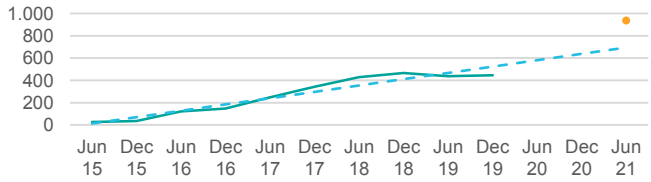

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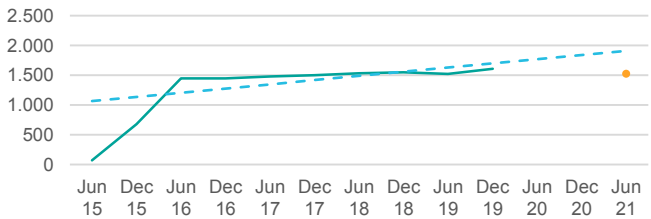
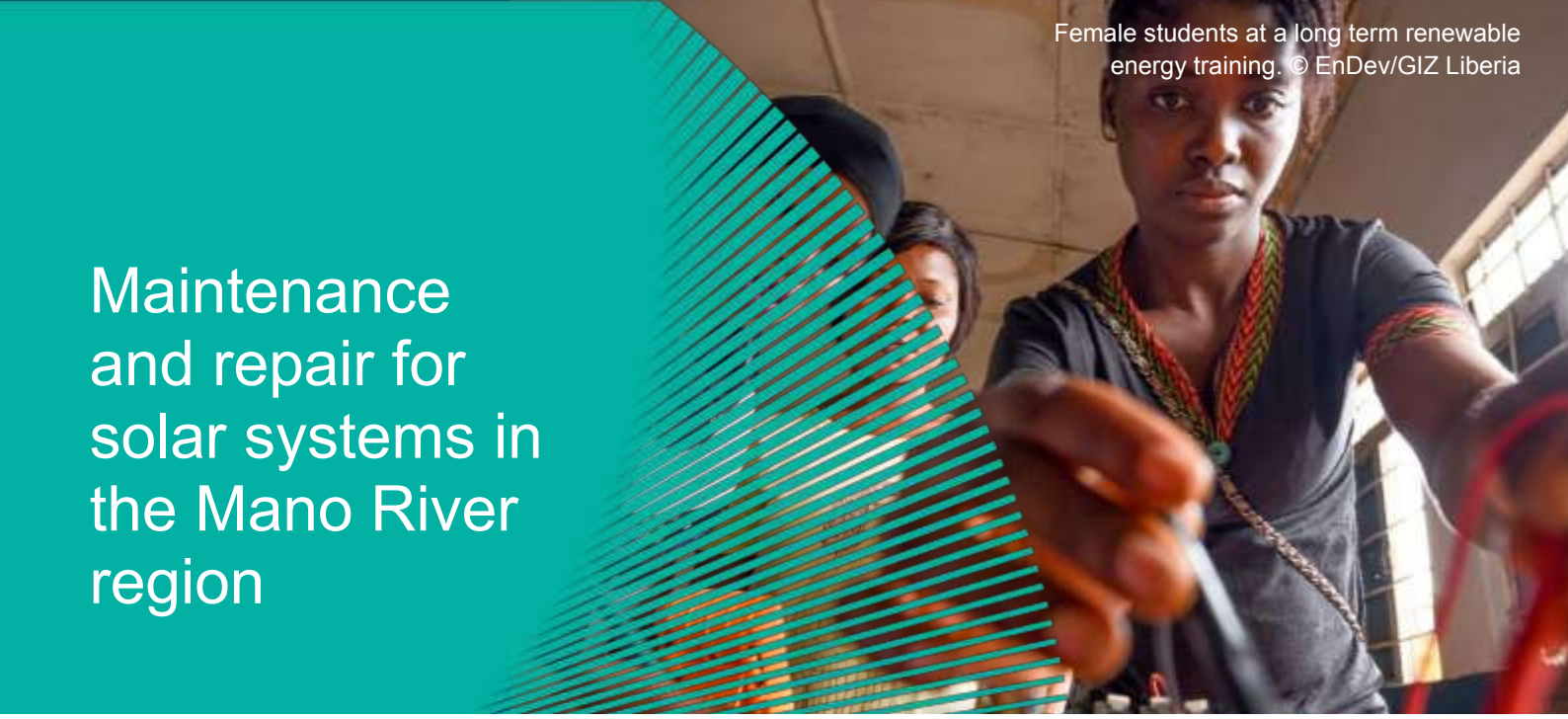




Female students at a long term renewable energy training. © EnDev/GIZ Liberia

Maintenance and repair for solar systems in the Mano River region

Background Information

EnDev Mano River is a multi-country project covering the resource rich but small, poor and disaster-stricken countries of Liberia, Sierra Leone, and Guinea, part of the Mano River Union. Since 2012 EnDev supported sustainable markets for stoves and solar technologies in a context, where energy sectors were weak and markets only emerging.
In the current phase (2019-2021) the project attempts to reach more scale, innovation and increase impact and regional synergies for small to large solar sustainable solutions and mini-grids. A focus is on coordination and capacity building for private and public sectors with access targets for clean cooking and electricity, as well for productive use and institutions.

Project Progress during Monitoring Period

- Strengthening and networking solar associations, companies and operators with technical expertise to launch PAYGO, assistance to increase size of installations, to reliable maintenance and repair and to operate mini grids successfully.
- Assisting as a national and regional sector coordinator: EnDev has increased its effort to facilitate data and information collection and sharing offline and online; and to assist to or organize regular stakeholder meetings for networking, associations and coordination in all three countries including valid dialogue on regulation and energy policies.
- Gender: EnDev is working on several levels to increase the role of women in the sector through training, stipends and self-organisation.
- Integration of deforestation, charcoal making study, assistance to creation clean cooking alliance, water protection, health and all cooking technologies including cooking gas into the overall energy approach.
- Innovation: wind, e-mobility, e-learning, battery charging, improved batteries, battery disposal, stove testing laboratory, passive energy.
- EnDev is promoting electric mobility through exploring e-bikes, electric tricycles and vehicles.

Maintenance and Repair

EnDev is increasingly active to identify ways to secure monitoring and repair of solar systems built. This entails a broad monitoring effort through visits, phone calls, and an app which registers and maps installations; it includes online registration of monitoring visits and repair needs of systems built. Technicians network and organize themselves with the public and private sector to secure repairs. EnDev supports this endeavour by contracting the private sector e.g. with the supply of spare parts, transport, advice and repair seminars and training. Trained women are increasingly part of this repair approach.
In Liberia, in the reporting period, thus 144 large (5 to 50 kW) and small (30 watt to 5 KW) solar systems mainly for schools and clinics were serviced, repaired and mostly brought back into full operation in 10 of 15 counties jointly with the private sector. In Sierra Leone 76 large and small solar systems were monitored, serviced and repaired. Seven mini-grids between 15 and 127 kW were monitored, repaired and staff trained to improve their service, operational and management approach. For all mini-grid operators in the three Mano River Countries an intensive technical one-week training was organized among other maintenance and installation trainings, e.g. for 300 solar systems installed for United Methodist Church.

Madagascar

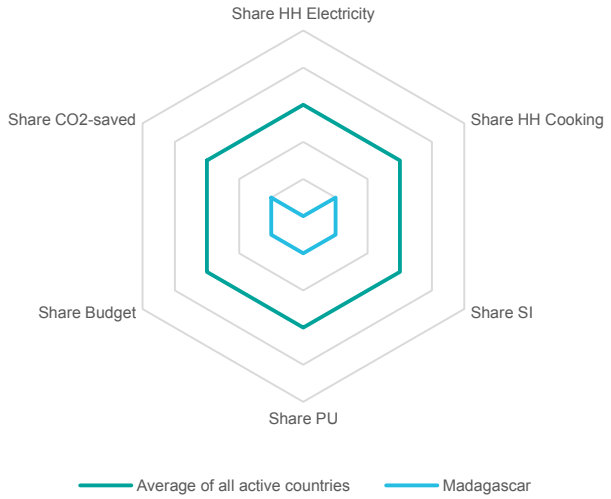
Country Facts

Population	26.3 million
Human Development Index	162 ↑ | Total (0.53)
UN Classification	LDC
Access Clean Cooking	< 5 %
Access Electricity	24.1 %

Project Facts

Project Period	12.2012 - 06.2021
Budget	EUR 1,289,000
Core Funding incl. RBF	EUR 1,289,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 248,022
Implementing Organisation	ADES+GIZ
Lead Political Partner	Secrétaire Général de la Région Atsimo Andrefana

Relevance

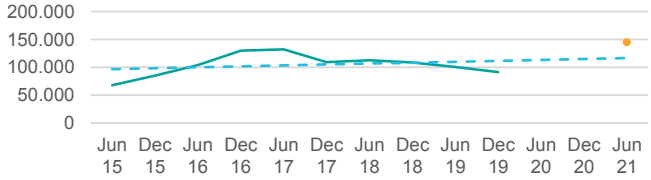


Project Results

	Targets	Achieved
HH Access Electricity	0.0	0.0
HH Access Cooking	145,000	91,471
SI Access	185	61
PU Access	390	417

HH Access Electricity

HH Access Cooking



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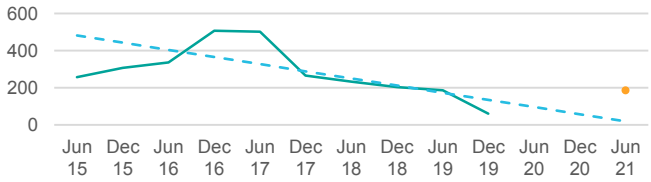

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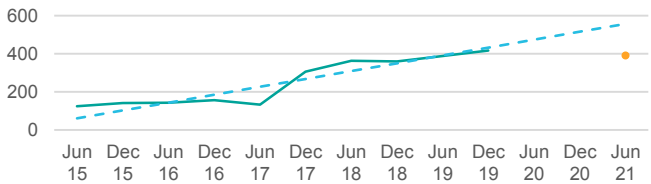


Supported schools reduced their fuel consumption by 60%


©ADES/Andre Gossen

Background Information

In Madagascar, EnDev cooperates with the Swiss NGO "Association pour le Développement de l'Energie Solaire (ADES)". Over 90 percent of the forests in Madagascar have already been lost, threatening not only biodiversity, but also the livelihoods of its inhabitants. ADES has been producing improved wood and charcoal stoves (ICS) with 50-70 % fuel savings for 19 years. Stove sales are accompanied by reforestation and education projects. With support from EnDev, a new semi-industrial production centre was co-financed. Since 2017, EnDev also supports mobile promotion centres for outreach to remote areas and pilots for the optimisation of cooking energy in school kitchens.

Project Progress during Monitoring Period

Over 40,000 ICS were sold in 2019, but sales fell slightly for the first time due to the requirement to introduce a 20% VAT and a longer than usual period between harvests (hungry season). Despite these factors, sales remained almost stable, showing the high demand. ADES is expecting sales to reach 70,000 ICS annually by 2025 and is building a second kiln to expand production of the clay ICS liners.
In 2019, the first mobile promotion centre – a converted truck – began operations and is on the road ten months a year, introducing the ICS to remote areas and sensitizing the population to its benefits. Building on this success, two additional mobile centres are being constructed to further expand outreach in peripheral areas. To improve the supply situation in schools, hospitals and other institutions, concepts for innovative canteen kitchens have been developed and implemented in selected schools. As a result of the improvements, the schools reduce their fuel consumption and the associated costs by at least 50% and also reduce the burden of harmful flue gases for their employees.

School Kitchens

Since December 2018, ADES has been designing modular cooking systems and piloting them in eight selected partner schools. After completion of the pilot phase, the results can be used to advise a range of commercial kitchens, including hospitals, commercial businesses and more schools. Each commercial kitchen should experience at least a 50% reduction in fuel consumption as well as improved kitchen ventilation, and solar cooking technologies are being tested for feasibility, for example to provide pre-heated water needed for cooking.

The pilot places a high emphasis on data collection, monitoring of new technologies introduced and training of the employees. Beyond introducing new appliances, the project will target kitchen design for ventilation, ergonomics and storage areas.

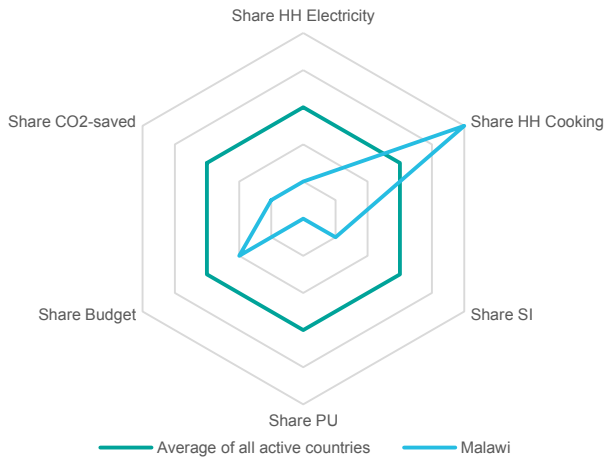
Training involves full week courses followed by refresher courses. First results from three schools that underwent the multi-stage training has shown that fuel savings increased after each training. Presently, the schools have reduced fuel consumption by 60% and greatly reduced the smoke exposure.

Malawi

Country Facts	
Population	18.2 million
Human Development Index	172 ↑ | Total (0.49)
UN Classification	LDC / LLDC
Access Clean Cooking	< 5 %
Access Electricity	12.7 %

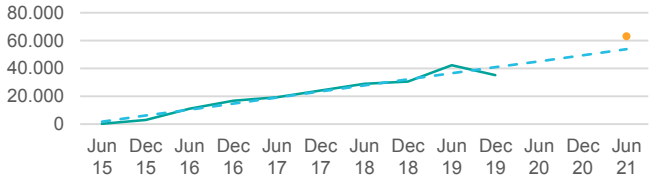
Project Facts	
Project Period	12.2012 - 06.2021
Budget	EUR 7,951,000
Core Funding incl. RBF	EUR 7,951,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 862,987
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Natural Resources, Energy and Mining / Ministry of Gender, Children, Disability and Social Welfare (for RBF)

Relevance

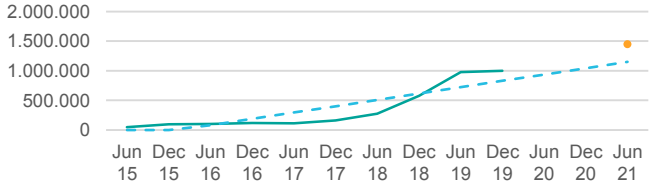


Project Results	Targets	Achieved
HH Access Electricity	63,000	34,994
HH Access Cooking	1,450,000	1,001,489
SI Access	15	3
PU Access	200	0.0

HH Access Electricity



HH Access Cooking



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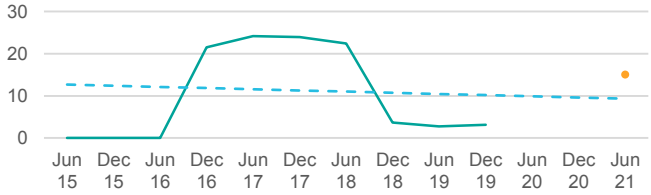

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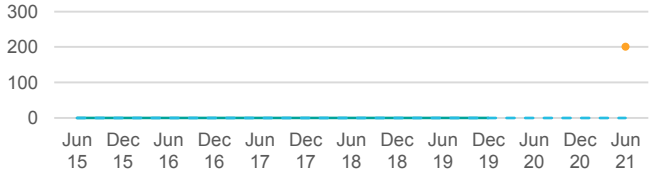


Even poor people can afford an improved cookstove


© GIZ Malawi/Khadija Mussa

Background Information

In the second half of 2019, EnDev Malawi has increased its project portfolio after earmarking two additional funds/grants: a co-financing agreement with the Government of Iceland and EnDev's top-up award.
The project has started to implement beyond its components: market development for improved cookstoves (ICS) and picoPV/SHS, and ventured into productive use of renewable energy (PURE) as well as an integrated energy project (including ICS, solar, PURE and social institutions) focusing on Mangochi district. Although the 2 new components are still in a preparatory stage, there are already exciting developments, e.g. prototyping of fuel-efficient fish processing stoves or the potential cooperation with a supplier for pumps using energy from flowing rivers.

Project Progress during Monitoring Period

In the last six months fewer sales have been registered mainly due to setting up the new structure and procedures. For the new project components of the ICEIDA co-financing and the PURE, the implementation is currently being set up.

Improved cookstoves: Stove sales have decreased from 187,000 to 56,232 in the second half of 2019. Nevertheless, sector coordination work under the National Cookstove Steering Committee (NCSC) has been very fruitful as large new players have been integrated and the Malawi Bureau of Standards was supported to integrate new ISO testing standards. Important milestones for sustainability were achieved by raising prices along the ICS value chain, setting-up warehouse and diversifying sales channels.

picoPV: The umbrella marketing campaigns now focus on one district at a time to intensify awareness raising and ease distribution as well as to pilot the concept of one-stop solar shops. The marketing team on the ground was complemented by a research team to professionalize the campaign work and to obtain additional information on customer behaviour, which is made available to partnering solar companies.

Energising employment for the youth in Malawi

So far, cooking was not a trendy topic to pull in the youth. It was rather the older generation being concerned about forest loss and engaging in cleaner cooking. This is changing now. EnDev's local implementation partner MAEVE recruited 24 young people as "stove runners" to conduct door-to-door sales in Likuni, a township in the capital Lilongwe. From the outset, the endeavour produced twin benefits: positive environmental impacts and job creation for the previously unemployed urban youth. Their innovative "Lay-By" sales approach targets low-income families, who now can pay in instalments and pick up their stove from a warehouse once the USD 2 sales price is collected.

Through this campaign, more than 3,000 stoves have been sold. Building on these successes, MAEVE is replicating the same approach in other towns such as Nkhotakota and Dwangwa.

RBF Malawi

Access to modern cooking energy for vulnerable groups in Malawi

In the last six months, claims no. eight and nine were submitted by United Purpose, the implementing partner, consisting of 29,802 and 6,800 stove supplies respectively. Claim no. eight has already been verified. So far 104,000 out of 118,000 stoves have been successfully distributed in all targeted districts defined in the first phase of the project. An addendum to the ninth claim is expected to be submitted and will be verified in Q1 2020.

In this semester, the project focused on the distribution of stoves to Social Cash Transfer beneficiaries in Lilongwe and Mwanza districts. For this purpose, a total of 63 (37 females, 26 male) promoters were identified and trained in the two districts. In total, 2,018 s and 5,116 stoves were distributed in Mwanza and Lilongwe districts respectively. In Lilongwe, three out of 18 Traditional Authorities (TAs) were supplied. The remaining 15 TAs will be supplied in the next semester.

Despite the excellent outcomes generated in the previous semester, project progress slowed down in the second half of 2019 resulted in a smaller number of stoves deployed than anticipated. The project will thus change its strategy, which includes e.g. engaging with more private sector actors and enhancing the cooperation with the MAEVE project to increase the number of commercial sales under the Leave No One Behind-oriented RBF project. The RBF project aims to supply additional 68,000 stove in the remaining project period which will end in September 2020.

RBF Learning Points

- Sub-contracting of stove supplier to entrepreneurs proved to be a faster way of distributing stoves to the respective promoters and helped to meet set targets within the project duration. It eased the logistical challenges that the project faced when delivering a large number of stoves within a short period of time. The combined efforts of United Purpose and the subcontracted supplier ensured that the distribution was finalised within the project timeframe.
- Closely working with other companies and organizations on commercial sales pre- and post the distribution to Social Cash Transfer beneficiaries has ensured sustainability with regards to stove supply and access in targeted areas. MAEVE, an implementing partner of EnDev Malawi for commercial stove market development, and Dziwani, the biggest stove producer in Malawi, continue to supply the stoves to the identified promoters in Lilongwe for sales post the RBF project implementation.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	339,500	303,121
EUR per beneficiary	1.44	0.89
CO_2e avoided	122,900	67,291[10]
EUR per t CO_2e avoided	3.99 €	4.01 €
Private sector leverage ratio	0	0
Jobs created	224	476
Jobs created thereof women	157	315
Enterprises created/upgraded	35[11]	0
Technologies deployed	118,000	104,598

[10] Please note that these figures are for information purposes only. They are not included in overall EnDev achievements, as in this project certificates are generated and sold on the voluntary market.

[11] Enterprises are not counted-under this project to avoid double counting with jobs created - as was advised by the RBF team in 2016. Only consider jobs created in the project.

Mali

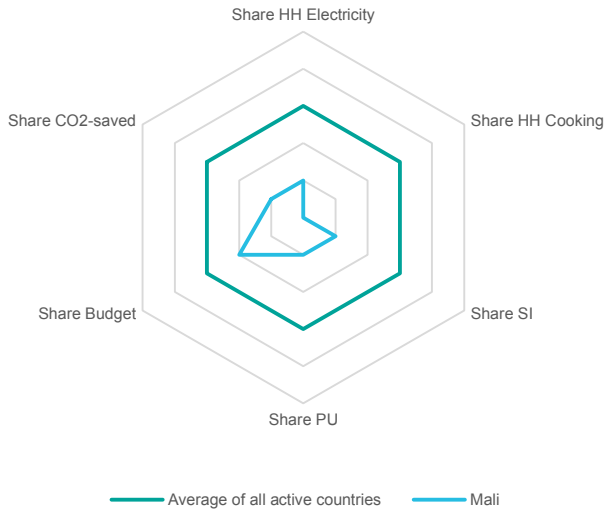
Country Facts

Population	19.1 million
Human Development Index	184 ↑ | Total (0.43)
UN Classification	LDC / LLDC
Access Clean Cooking	< 5 %
Access Electricity	43.1 %

Project Facts

Project Period	01.2013 - 06.2021
Budget	EUR 10,057,000
Core Funding incl. RBF	EUR 10,057,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 720,614
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Water and Energy

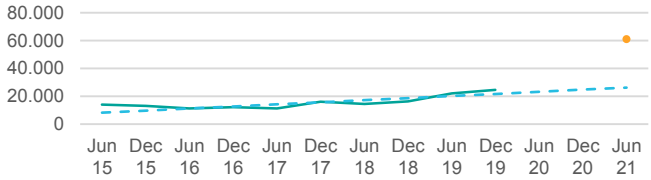
Relevance



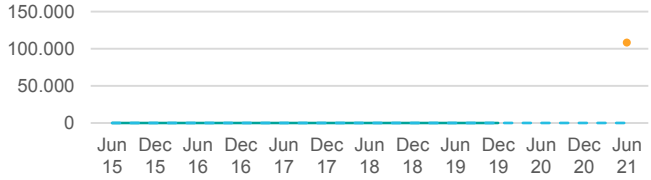
Project Results

	Targets	Achieved
HH Access Electricity	60,800	24,552
HH Access Cooking	108,000	0.0
SI Access	500	184
PU Access	460	64

HH Access Electricity



HH Access Cooking



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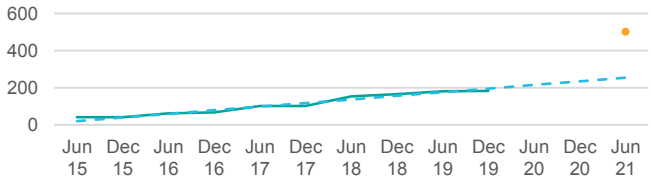

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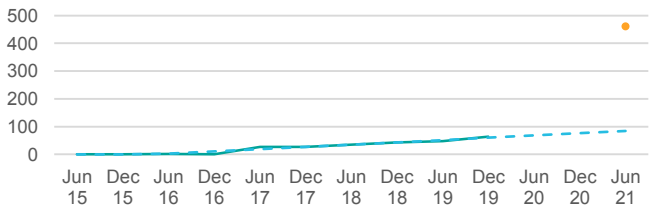


Comprehensive solar market development

Background Information

During the period 2009-2019, EnDev Mali supported the development of the solar market with a comprehensive portfolio of technologies (incl. picoPV, SHS, energy kiosks, and mini-grids).
For the new phase 2019-2021, EnDev Mali is focusing on up scaling the off-grid solar activities, and on launching a new ICS project. The new ICS component aims to establish a national quality assurance system and boost semi-industrial producers using results-based incentives, while gaining market intelligence and testing pilots for commercial ICS and alternative fuels.

Project Progress during Monitoring Period

During this semester, EnDev Mali continued the execution of the off-grid solar project while signing the grant agreements and preparing project activities with SNV and the Nordic International Support Foundation (NIS). Most important activities include:

- Baroueli district: finalization of the contract phase for the construction of a mini hybrid power plant (120 kWp) et ist 12.5km LV electrical network in the municipality of Sanando. In parallel, the identification of beneficiaries, such as households, SME and SI, is in progress.
- Administrative central region of Segou: the off grid solar electrification of clinics is at the planning phase. A capacity building diagnostic and energy need assessment in 184 clinics was carried out, and prioritizing actions were set.
- NIS electrification component in the North of Mali for peace and security: NIS started to prepare the activities which aim at promoting five complementary solar energy solutions delivering basic electricity-infrastructure in 3 pilot villages.
- SNV cooking energy component: SNV prepared the activities to expand the pioneering market for households ICS in urban and peri-urban areas. The introduction of efficiency and quality label has a central place in the project approach to drive a sustainable ICS market. About 90,000 additional stoves are expected to be delivered by end 2022.

Cooking energy project launch workshop in Mali

The project launch workshop was jointly organized by SNV, the Malian Energy Agency and the Malian Clean Cooking Alliance. It took place on 12-13 December 2019 in Bamako, Mali.
The workshop presented the first opportunity for SNV to share the context, scope, objectives and benefits of the project with policy makers, civil society and private sector. The event also offered a policy and research side to stimulate discussion around the market barriers and effective market transformation solutions such as introducing, collaboratively, an efficiency and quality label for household stoves in Mali.
The stakeholders agreed to set up 03 task forces to support the stove labelling initiative: (1) efficiency and quality label definition, (2) compliance monitoring and enforcement plan, (3) branding strategy.

The project being launched will also create synergies with the EnDev Mali rural electrification component to drive energy market transformation.

Mekong

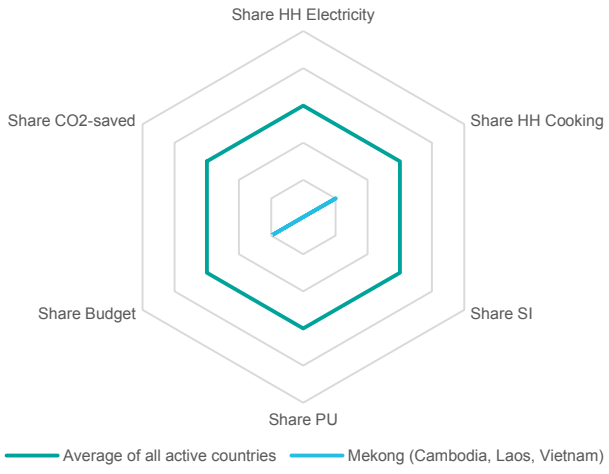
Country Facts

Population	CA: 16.3 million LA: 7.1 million VN: 95.6 million
Human Development Index	CA: 146 ↓ | Total (0.59) LA: 140 ↑ | Total (0.61) VN: 118 ↓ | Total (0.70)
UN Classification	CA: LDC, LA: LDC VN: LLDC
Access Clean Cooking	CA: 20 %, LA: 5 % VN: 70%
Access Electricity	CA: 90 %, LA: 5 % VN: 100 %

Project Facts

Project Period	03.2015 - 06.2021
Budget	EUR 4,163,000
Core Funding incl. RBF	EUR 4,163,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 406,097
Implementing Organisation	SNV
Lead Political Partner	CA: Ministry of Mines and Energy (MME), LA: Ministry of Science and Technology (MoST), VN: Vietnamese Women's Union (VWU)

Relevance

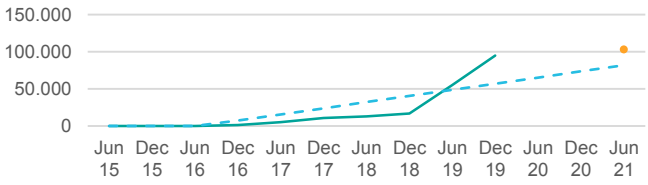


Project Results

	Targets	Achieved
HH Access Electricity	0.0	0.0
HH Access Cooking	103,000	94,973
SI Access	0.0	0.0
PU Access	0.0	0.0

HH Access Electricity

HH Access Cooking



SI Access

PU Access

Building the market for higher-tier cookstoves

FastFire/C-Quest Capital Cambodia

Background Information

The previous phase of the Mekong project created an initial market for higher-tier biomass cookstoves in Cambodia, Vietnam, and Lao PDR. The follow-on phase, started in 2019, aims to support the maturing and scaling of the still nascent local industry. In Cambodia, this includes addressing market barriers through sector support mechanisms such as performance-based co-investments in early-stage market actors, demand creation activities, and business advisory. In Laos, the intervention mainstreams gradually more advanced cookstoves into the existing ecosystem for improved cookstoves (ICS), and expands reach of the supply chain to unserved areas - including a 'leave no one behind' focus on very poor/remote areas. Project activities in Vietnam ended.

Project Progress during Monitoring Period

The follow-on project phase has become fully active in mid-2019. In Cambodia, focus is on local higher-tier stove production and expansion of distribution structures. Grants have started with 3 stove enterprises to address company specific growth barriers; technical support helped upgrading a local stove model to higher tier performance; a national awareness campaign with focus on digital/social media is in the planning; a new RBF incentive to trigger increased stove use/reduced stacking is about to start; and engagement with the traditional ICS supply chain intensified and resulted in the introduction of a new stove model [see text box]. In Laos, all 19 existing ICS producers received training to produce the new more advanced intervention stoves. Work related to the establishment of 6 new production centers in the yet unserved Northern provinces was completed and trial production started. The production centers will be fully operational in Q1 2020. Campaigns to educate consumers about the negative impacts of conventional stoves continued this semester, as did the building of new partnerships to reach poorer/more remote communities. The activities resulted in significant sales growth with numbers expected to increase even more once the new production centers become operational. Vietnam also reported significant sales for the second semester in a row since project closure.

Exposure Visit: Cambodian ICS producers visit Lao industry counterparts

In November 2019, a group of Cambodian ICS producers was supported by the EnDev project to participate in an exchange visit with industry counterparts in Laos. The Cambodian producers witnessed the production process of the comparatively more advanced Lao ICS, experienced the national ICS quality assurance mechanism first-hand through a laboratory visit, and were briefed on the Lao ICS-brand marketing strategy. The exchange was a celebration and recognition of similarities between like-minded industrypeople from different countries and cultures. Inspired to start producing the advanced Lao ICS, the Cambodian group returned home with blueprints and production equipment. The engagement already resulted in the introduction of the new stove model in the Cambodian market. With the first 10 producers of the Cambodian CESPA network engaged and more to follow in 2020, this adds a new dynamic to the Cambodian market for advanced cookstoves. CESPA and the existing supply chain for ICS have to-date disseminated more than 2 million ICS in Cambodia, offering large potential to work through this nationwide production and distribution network for the introduction of better stoves.

Mozambique

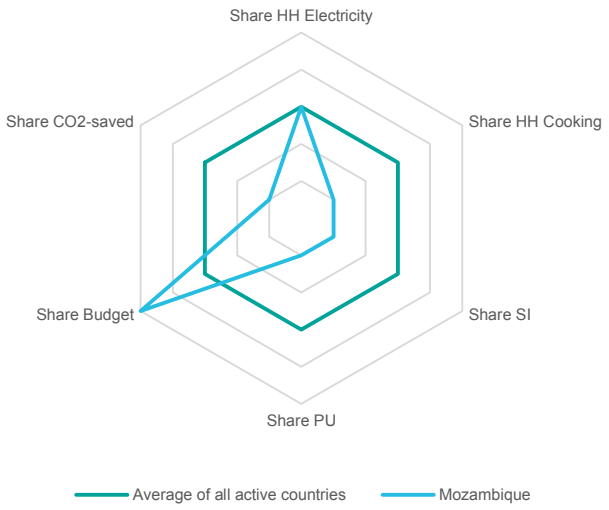
Country Facts

Population	29.5 million
Human Development Index	180 ↑ | Total (0.45)
UN Classification	LDC
Access Clean Cooking	< 5 %
Access Electricity	27.4 %

Project Facts

Project Period	10.2009 - 06.2021
Budget	EUR 21,576,000
Core Funding incl. RBF	EUR 21,576,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 1,503,032
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Mineral Resources and Energy

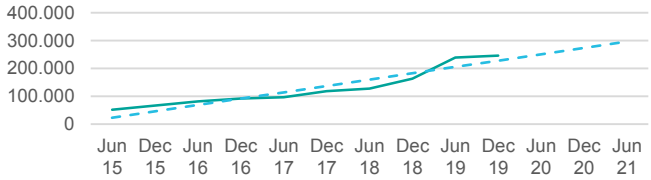
Relevance



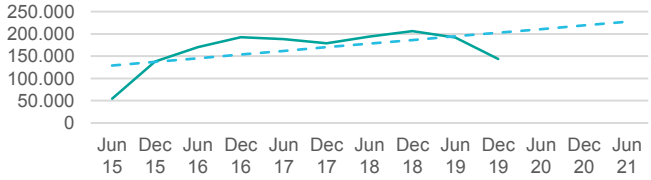
Project Results

	Targets	Achieved
HH Access Electricity	TBD	245,876
HH Access Cooking	TBD	143,303
SI Access	TBD	7
PU Access	TBD	41

HH Access Electricity



HH Access Cooking



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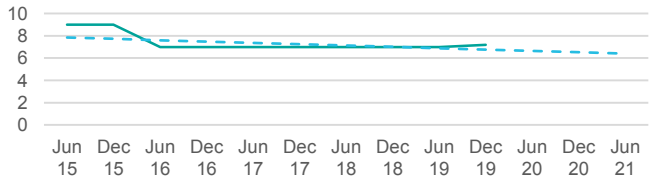

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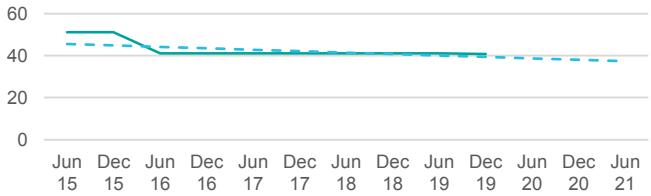


Satisfying needs for cooking energy and electricity in Buzi district

Resettlement Area in the district of Búzi, Sofala provincet

Background Information

In 2019 Mozambique was hit by two tropical cyclones, causing major destructions of key infrastructure in various provinces. Over 2 million people were displaced and in need of humanitarian aid. Displaced people were resettled in areas lacking access to basic infrastructure and services. Besides, in Mozambique almost 50% of the population is living in poverty and only 24% have access to electricity. In rural areas the electrification rate is even as low as 5%.

Project Progress during Monitoring Period

In response to the humanitarian crisis caused by the tropical cyclones, EnDev Mozambique worked in close collaboration with the Mozambican Government, humanitarian organisations and the private sector to adjust the project approach to the new situation. The objective is to target the affected regions and resettled people based on the changed social and economic situation, while avoiding market distortion.

In close cooperation between EnDev and the German global programme “Green Peoples Energy” the Results-based Financing (RBF) Fund FASER (Fundo de Acesso Sustentável às Energias Renováveis) hosted by the Fundação para o Desenvolvimento da Comunidade (FDC) has been launched. The objective of FASER is to improve access to finance for companies and set incentives to accelerate market growth for solarPV and cooking energy products. Target groups are households and SMEs to facilitate productive use of energy and income generation. One funding window is dedicated to support access to electricity and clean cooking solutions for people affected by the tropical cyclones.

Basket fund FASER

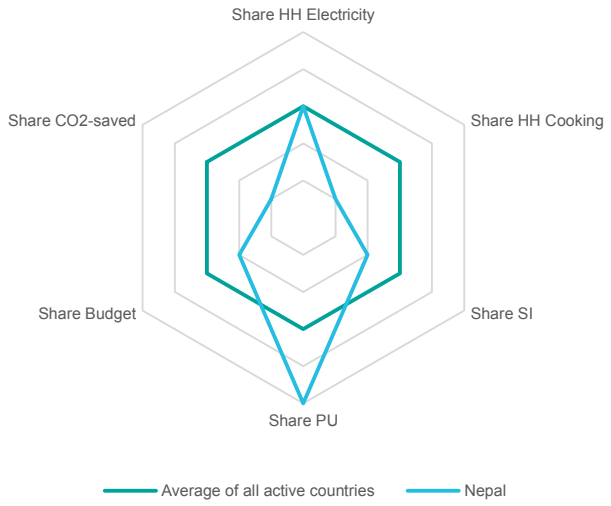
The Fund is structured along three funding windows: (1) Energy Access, (2) Productive Use of Energy, and (3) Energy Access in Humanitarian Settings. The funding windows are designed according to the specific needs of different target groups and objectives of different funding sources. The fund follows a Results-based Financing (RBF) approach.
In the second semester of 2019, the first call for applications has been concluded and contracts for all three funding windows were signed. Implementation is ongoing.
While FASER initially functions as an implementing mechanism for EnDev and GBE, it is designed as a basket fund open to absorb additional funding from other sources subject to expressions of interest, complementarity and/or clear synergies.
The post-humanitarian aid funding window will be topped-up with a financial contribution from the Norwegian Agency for Development Coorperation (NORAD) with additional 6 million EUR.

Nepal

Country Facts	
Population	28.1 million
Human Development Index	147 ↑ | Total (0.58)
UN Classification	LDC / LLDC
Access Clean Cooking	29.0 %
Access Electricity	95.5 %

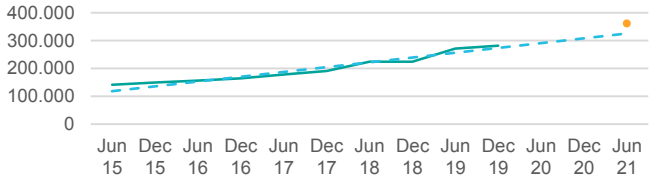
Project Facts	
Project Period	05.2009 - 06.2021
Budget	EUR 9,854,000
Core Funding incl. RBF	EUR 9,854,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 901,437
Implementing Organisation	GIZ, Practical Action, SNV
Lead Political Partner	Ministry of Energy, Water Resources and Irrigation

Relevance

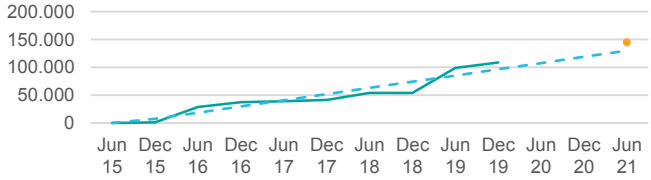


Project Results	Targets	Achieved
HH Access Electricity	360,000	281,196
HH Access Cooking	145,000	108,309
SI Access	820	814
PU Access	6,330	3,725

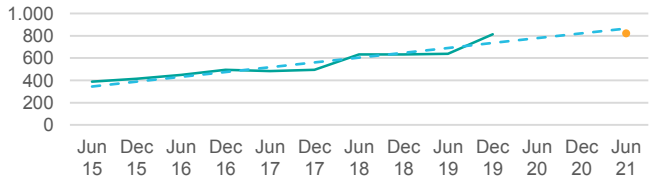
HH Access Electricity



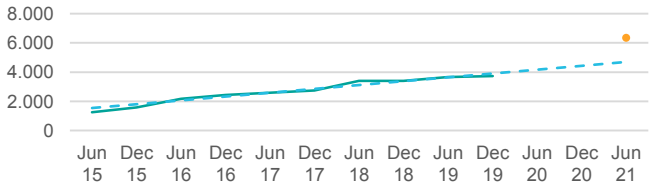
HH Access Cooking



SI Access



PU Access



Grid densification to leave no one behind in Nepal


@ GIZ/Hari Chuwan

Background Information

Since 2005, EnDev supports access to electricity and cooking energy for rural communities through (1) a Revolving Fund (RF) for Community Rural Electrification Entities (CREE) which enables them to pay the required own share - a precondition to benefit from a National Rural Grid Extension Programme. EnDev also provides technical support to CREEs and promotes productive use of electricity. (2) a Micro Hydro Debt Fund (MHDF) reduces the perceived risk for commercial banks to invest into the off-grid hydro power sector. (4) EnDev supports the switch of mechanical watermills to energy suppling pico hydro systems through technical retrofitting. In 2019, EnDev Nepal started to mainstream RBF and set up (5) a RBF project for improved cookstoves to continue to drive market development for improved cookstove forward in rural areas of Nepal.

Project Progress during Monitoring Period

Electricity access was provided to additional 974 households (HH), 35 social institutions (SI) and 31 enterprises through the revolving fund (RF). Under Grid Densification, and through connection incentive support to CREEs, additional 903 HHs who are financially incapable of affording the upfront cost for grid connection got access to the grid. By extending the focus on SI, 155 streetlights were facilitated and contribute to the projects target achievement on SIs. Thanks to the MHDF, two new Micro Hydro Power Plants (MHPP) in Karnali province were recently financed and are now under construction. These two new plants of combined 145 kW will provide electricity access to 1,600 HHs located in remote and least developed areas of Nepal. In the course of the MHPP projects Solu Khola and Molung Khola, 1,300 smart meters were successfully installed resulting in effective tariff collection and management in HHs. The support of social mobilizers facilitated the timely repayment of past dues, resulting in an average of 80% of principal amount payback from 26 MHPs. Poku Dovan Khola(45 kW) and Khani Khola (20 kW) MHPP has been rehabilitated with AEPC support.

Electricity access: Changing life of a young mother

Married at a very young age of 17, Sita Maya Tamang (26) lives with her four children and husband in a remote village named Baguwa in Mahottari District. Although the village was connected to the grid facility, her family was deprived from grid electricity due to their weak financial situation. So, the family had to completely rely on kerosene lamp as the only source of energy used for lighting which made it difficult for her to carry on with daily household chores. She recalls an incident which nearly took the life of her new-born as vividly as if it was yesterday “my son was only 7 days old when he was stung by a centipede which resulted in extreme swelling and made him unconscious for a day. He did not eat anything for the next 24 hours. As there was no electricity, I was not able to see the insect which bit him”.

EnDev in coordination with Shree Sagun Community Rural Electrification Entity in Mahottari district supported Sita Tamang and other 105 marginalized families to get access to grid electricity through grid densification program. With access to electricity, the life of Sita Tamang has changed for better. Holding her child with a bright smile she says, "Now I can do my household chores in less time, my children are safe and can study in the evening as well".

RBF Nepal

Result Based Financing for Sustainable Hood-stove Markets in Nepal

In September 2019, the RBF project for hood-stove markets in Nepal closed successfully. More than 63 manufacturer and retailers sold a total of 47,180 improved biomass cookstoves providing improved access to energy to 215,243 people in 15 districts of Nepal. In achieving this result, the project target of 34,900 hood-stove and portable stove sales providing 172,755 people with improved access was exceeded by 24%. In addition, 231 local financial cooperatives participating in the RBF project received technical assistance for setting-up new credit lines for improved cookstoves. For each loan they provided to end-users a financial incentive was disbursed. By doing this, the RBF project not only prepared the ground for long-term availability of affordable financing options but helped to increase the demand for cookstoves. The project disbursed EUR 1,061,850 as sales incentives to enterprises and end-consumers and as loan incentives to cooperatives.

In the second phase of the reporting period, a project closing workshop was organized where 102 different sector stakeholders shared their learnings and experiences. Likewise, a video documentary was developed to disseminate learnings of the project.

RBF Learning Points

A final evaluation was carried-out by the Social Welfare Council (SWC). The report concluded that RBF incentives to the private sectors motivated them to build supply and dissemination channels for cookstoves to rural Nepal. It helped them to minimize risks, make cookstove sale a viable business and increase their capacity to meet the cookstoves demand on their own. The RBF approach is very successful in leveraging the private sectors' investment, creating ownership, increasing production, and in setting quality standards. The evaluation showed, that mostly educated and better-off households benefitted as end-user of the RBF project. To ensure a leave-no-one behind targeting extra support and investment is required. Equally important is to find the right balance in the incentive structure, which can help to achieve scale with inclusion (gender, poverty, remoteness).
The integration of and coordination with local change agents and institutions is as crucial as the product marketing of the private sector. Large scale behavioural change campaigns supported product marketing and contributed to demand creation.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	172,755	215,243
EUR per beneficiary	9.70	6.80
CO_2e avoided	343,200	228,329
EUR per t CO_2e avoided	4.88	6.41
Private sector leverage ratio	1.0	1.0
Jobs created	150	258
Jobs created thereof women	-	97
Enterprises created/upgraded	20	35
Technologies deployed	34,900	47,180

Rwanda (with activities in Burundi and DRC)

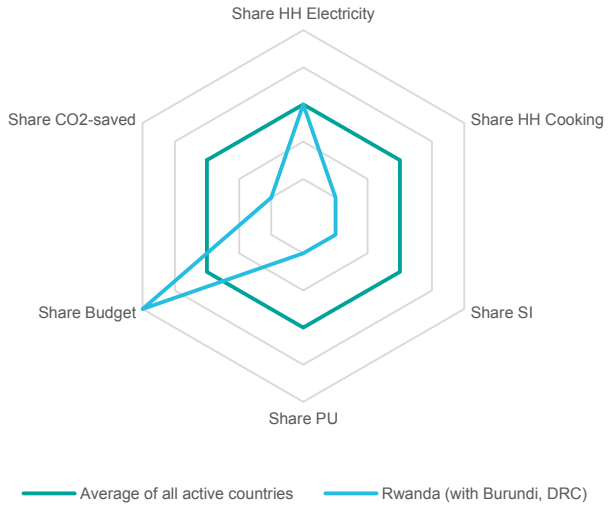
Country Facts

Population	BI: 11.2 million RW: 12.4 million
Human Development Index	BI: 185 ↑ | Total (0.42) RW: 157 ↑ | Total (0.54)
UN Classification	BI: LDC / LLDC RW: LDC / LLDC
Access Clean Cooking	BI: < 5 % RW: < 5 %
Access Electricity	BI: 10 % RW: 35 %

Project Facts

Project Period	10.2009 - 06.2021
Budget	EUR 25,060,600
Core Funding incl. RBF	EUR 23,650,600
Earmarked	EUR 1,410,000
Average Annual Turnover	EUR 2,496,556
Implementing Organisation	GIZ
Lead Political Partner	Rwanda Energy Group – Energy Development Company Limited / Ministry of Infrastructure

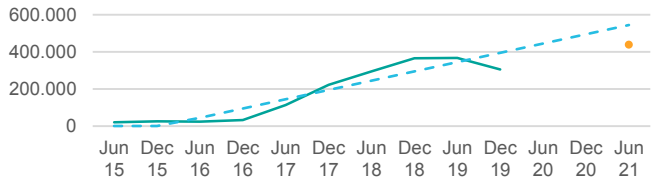
Relevance



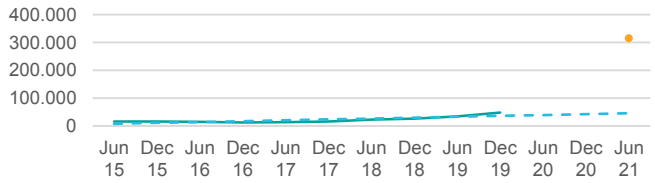
Project Results

	Targets	Achieved
HH Access Electricity	438,000	304,874
HH Access Cooking	315,000	48,368
SI Access	55	29
PU Access	290	211

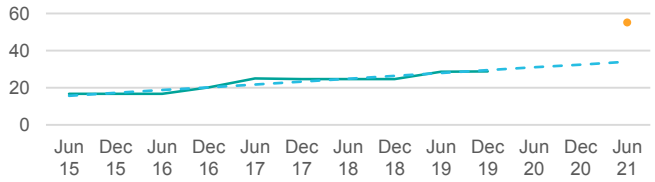
HH Access Electricity



HH Access Cooking



SI Access



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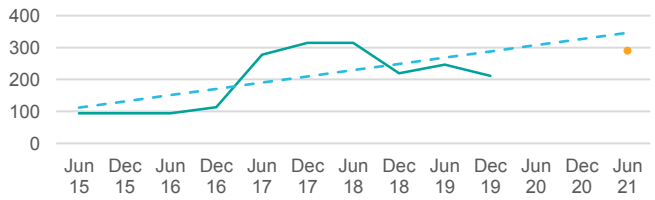


What's cooking? Exchange across borders

Photo credit: GIZ/Haguma Mugeni

Background Information

The Government of Rwanda aims to achieve universal access to electricity by 2024. Since 2010, the government has tripled on-grid connections, reaching 36% of households. An additional 13.6% have gained access to electricity through off-grid technologies. Nonetheless, Rwanda's per capita energy consumption is among the lowest in the world. Although larger industries are connected to the grid, most small businesses in rural areas remain without access to electricity.
In Burundi, the electrification rate is extremely low and use of inefficient cookstoves very high. As there is no structured approach or national strategy to improve the situation in the sector, EnDev works directly with the target groups and independent from government institutions.

Project Progress during Monitoring Period

Following the first phase ("Solar Lighting") of the picoPV RBF, preparations were completed for the second phase ("Pro Poor"). The call for applications was launched in November 2019 and four companies had applied by end of 2019, with the first contract signed in mid-December.

In the on-grid hydro power component, one power plant has been completed and four are under construction, in different stages. In total 3.4 MW will be added to the grid, which means approx. 65,000 beneficiaries.
.

In Burundi, monthly dissemination of improved cookstoves (ICS) doubled by end of 2019 compared to the first semester of the same year. This was largely due to the intensified awareness campaign started by the end of 2018, to the increase of the resellers network and to some strategic partnerships concluded (e.g. with tea cooperatives, clerical organizations and World Food Programme). Altogether, 81,327 people have benefitted from ICS over a period of three years

What's cooking on the other side?

In the area of improved cooking systems, this regional EnDev component is actively promoting cross-border and cross-institutional exchange. A regional network has been established between the three cooking activity implementers AVSI, GIZ and SNV, and the three target countries Burundi, DRC and Rwanda. While challenges and national contexts are always somewhat different between countries (e.g. in terms of demographic pressure), many benefits can be reaped from looking abroad, e.g. learning about stove technology, organising joint entrepreneurship training, jointly addressing common testing and standards, or increasing sales markets for businesses to target. All involved implementing agencies have their own experiences and contacts in this area and have everything to gain from sharing them.)

RBF Rwanda Pro-Poor

Pro-Poor Results-Based Financing

The first phase (Solar Lighting) of the picoPV RBF project officially closed at the end of June 2019. All contract with private sector companies came to an end and. With the last successfully verified claim in August 2019, 85% of the incentive budget (EUR 2.2 million) for the first phase was disbursed and 531,000 beneficiaries were reached. The remaining budget was transferred to the second phase of the RBF project (Pro Poor)

The Pro Poor RBF project preparations were completed and the call for applications launched in November 2019. During the preparations it was decided that the Pro Poor RBF project would only be implemented in five districts in the Southern Province to facilitate monitoring, analysis and adaptation. Four companies applied by the end of 2019 of which one company signed the contract and started selling by mid-December. Due diligence for the remaining three applications was expected to be finalized by early 2020 to proceed to contracting.

Considering the progress made, the Government of Rwanda relaunched discussions with donors to upscale the Pro Poor RBF project to a nationwide initiative. EnDev is supposed to actively support learning from past experience.

Overall, uncertainty regarding the implementation of the government's solar standards remain a key challenge and risk. As the standard will only support larger systems than supported by the RBF project companies have been unable to import new systems for over a year. EnDev continues to engage with the government on this topic to ensure the success of the Pro Poor project and the sector's sustainability.

RBF Learning Points

Coordination & cooperation with others

Close coordination and cooperation with local government partners that may not be familiar with the RBF approach or the EnDev programme are key to overcoming initial resistance to new approaches. Continual engagement and the integration of joint reviews into the project design are crucial success factors.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	681,125	583,043
EUR per beneficiary	6.53	4.46
CO_2e avoided	35,546	33,650
EUR per t CO_2e avoided	125.19	77,23
Private sector leverage ratio	3.0	7.3
Jobs created	100	1,534
Jobs created thereof women	Tbd.	394
Enterprises created/upgraded	10	10
Technologies deployed	229,700	164,475

RBF Rwanda Village Grids

Sustainable Market Creation for Renewable Energy Village Grids

The Village Grid RBF project has disbursed incentives amounting to EUR 297,582 to date and approximately 88% of its incentive budget is allocated. Four new private sector companies were contracted in December 2019.

After 151 operating connections were verified, incentives for Absolute Energy's 2nd connection claim were disbursed in September 2020. The drop in operating customers was due to slow uptake after the initial commissioning. Absolute Energy has been working on customer retention through promotions and awareness raising. This has proven successful as they have exceeded the claimable 505 customers in their third connection claim submitted on December 31st. Meshpower is expected to commission the mini-grids which will connect 310 households. Both projects are expected to close in Q2 or early Q3 2020.

Four new companies have been contracted:

- Topsteps-Mugambazi offering a 48kW hydro power grid with 292 connections. The commissioning deadline is July 31st 2020.
- ESC-Rubaba is offering a 20kW hydro power grid with 166 connections. The commissioning deadline is July 31st 2020.
- Equatorial Power - Gakatagi is a 120kW solar power grid (4 clusters). The commissioning deadline is June 30th 2020.
- RENERG - Banda offers a 35kW solar grid extension (total 65kW). The commissioning deadline is June 30th 2020.

RBF Learning Points

Uptake of energy: customer acquisition and retention

Uptake of the energy service is not always immediate at commissioned mini-grid sites and can take weeks or months. Price adjustments by the developer, awareness raising, and marketing may be required to boost the timely uptake after commissioning.

Mini-grids are infrastructure assets and need long-term planning with suitable long-term infrastructure capital (grants, debt etc.) to scale. It is only 5 years after the launch of the Village Grid RBF project in Rwanda that the project is witnessing visible and impressive results in terms of policy and regulatory development, viable technologies, improved capacity of developers and interest of private sector and government support.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of Beneficiaries	12,300	3,993
Number of Social Institutions	250	16
Number of SMEs	40	309
EUR per Beneficiary	153.74	320.60
CO_2e Avoided	3,359	1,270
EUR per t CO_2e Avoided	562.97	1,007.86
Private Sector Leverage Ratio	1.0	0.2
Jobs Created	90	116
Jobs Created thereof Women	Tbd.	56
Enterprises Created/Upgraded	200	280
Technologies Deployed	36	1,294 connections

Senegal

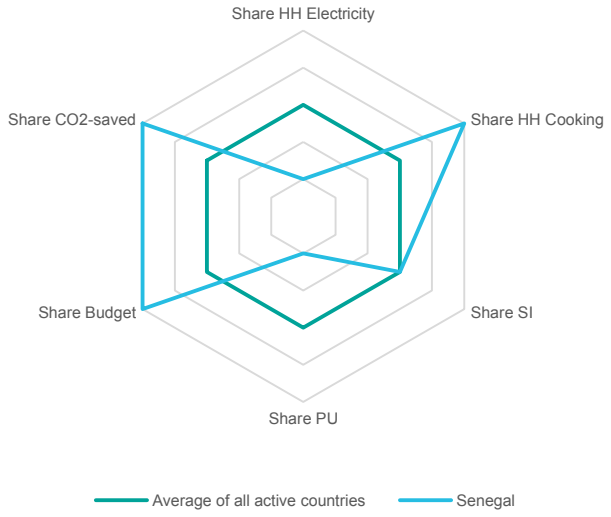
Country Facts

Population	15.9 million
Human Development Index	166 ↑ | Total (0.52)
UN Classification	LDC
Access Clean Cooking	31.0 %
Access Electricity	61.7 %

Project Facts

Project Period	05.2009 - 06.2021
Budget	EUR 21,298,354
Core Funding incl. RBF	EUR 18,928,000
Earmarked	EUR 2,370,354
Average Annual Turnover	EUR 1,914,366
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Petroleum and Energy

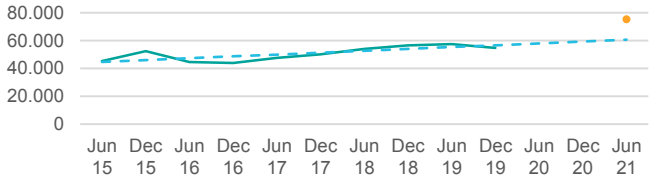
Relevance



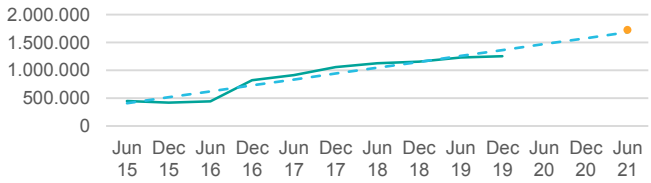
Project Results

	Targets	Achieved
HH Access Electricity	75,000	54,697
HH Access Cooking	1,725,000	1,253,328
SI Access	1,350	1,140
PU Access	1,500	548

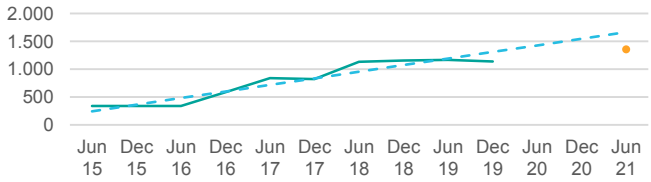
HH Access Electricity



HH Access Cooking



SI Access



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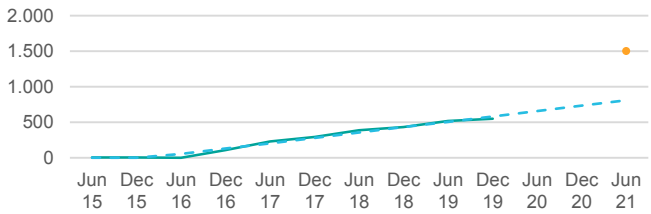


Celebrating the Green Climate Fund's commitment to Senegal

Celebration at the COP25 in Madrid

Background Information

The Government of Senegal (GoSN) plans to extend the national grid far into rural areas based on the exploitation of natural gas resources from 2023 onwards. Public and private investments will stimulate the extension and densification of the national grid. Complementary, 720 mini grids are currently under construction through donor programs. EnDev's role is to be the 'innovation lab' for testing and scaling of new solutions in rural electrification. Domestic cooking on biomass contributed in 2010 about 17% of all GHG emissions in Senegal. To reduce these emissions, GoSN targets cumulative sales of 8.4 millions ICS until 2030 (NDC). EnDev professionalised ICS production, increasing annual sales from below 40.000 (2010) to over 200.000 (2018).

Project Progress during Monitoring Period

The institutional challenges of off-grid rural electrification in Senegal (see the programming document) have become more apparent in the current semester. The government promised a harmonized electricity tariff and approved the respective regulation. However, the funds to implement this reform are not (yet) available. An increasing number of rural clients is no longer prepared to pay their higher electricity rates, demanding government to provide them with cheaper electricity of the national grid. Some stop paying their bills or even enforce that the minigrid is dismantled (in 5 of 86 villages). EnDev will engage further with all relevant stakeholders to facilitate more clarity to the rural population and the operators on the way forward.

The professionalisation of the ICS sector in Senegal is further progressing. The monthly sales increased by 12% compared to the last semester and 15% compared to second semester of 2018. EnDev worked intensively on awareness creation through radio spots in 14 local radio-stations. EnDev Senegal also was strongly involved in the preparation of the GCF project and the German funded 'Green Peoples Energy'-project.

Climate-Friendly Cooking: Kenya and Senegal

Following the Approval of the Funding Proposal by the Board of the Green Climate Fund (GCF) in February 2019, the Funded Activity Agreement (FAA) between the Green Climate Fund (GCF) and GIZ was developed, discussed and finally signed in November 2019. This has been an important step towards starting the project in the first semester of 2020.
The signature was celebrated on the COP25 in Madrid by representatives from GCF, Kenia, Senegal and Germany. In December, BMZ approved their share of the funding and commissioned GIZ with the implementation of the project.
With further preparatory steps to be taken, it is anticipated that the FAA will become effective in March 2020, and the first funds to be disbursed latest in June 2020.
The country teams in Kenya and Senegal will use the first Semester of 2020 for the required restructuring of their teams and organisational structures as well as the preparation of the necessary documents like an operational manual.

Tanzania

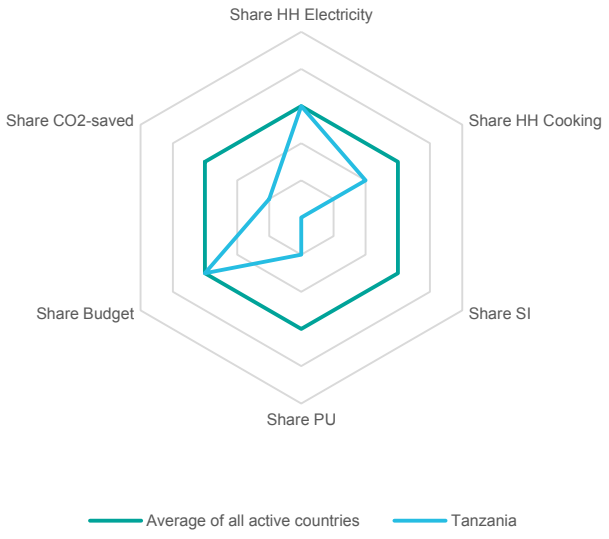
Country Facts

Population	56.3 million
Human Development Index	159 ↓ | Total (0.53)
UN Classification	LDC
Access Clean Cooking	< 5%
Access Electricity	33.0 %

Project Facts

Project Period	12.2012 - 06.2021
Budget	EUR 12,200,000
Core Funding incl. RBF	EUR 12,200,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 1,392,509
Implementing Organisation	SNV+GIZ
Lead Political Partner	Ministry of Energy

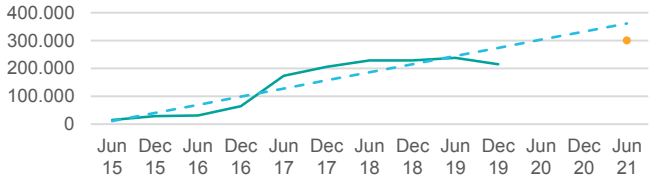
Relevance



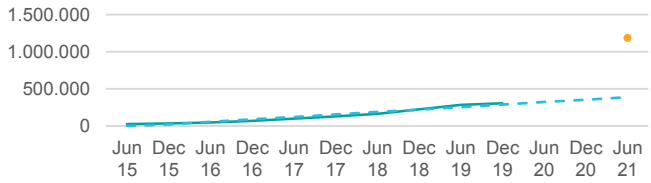
Project Results

	Targets	Achieved
HH Access Electricity	300,000	241,545
HH Access Cooking	1,185,000	305,622
SI Access	0.0	0.0
PU Access	11,500	184

HH Access Electricity



HH Access Cooking



SI Access

PU Access

Leading enterprises pushed their sales by 300% and more

Selling Matawi stoves in Tanzania.

Background Information

EnDev Tanzania is implemented by SNV and supports ICS and picoPV markets. The Tanzania Improved Cook Stoves (TICS) component focuses on the establishment of pre-commercial cookstove producers and the transition of high performers to pioneering commercial enterprises. Starting in 2013, EnDev developed a multi-purpose improved cookstove called the 'Jiko Matawi' that burns both firewood and charcoal depending on the user preference. TICS grooms stove entrepreneurs through successive stages of technical and business development supports paired with awards of performance based non-monetary incentives such as manufacturing equipment and tailored marketing tools. In 2020, the component will expand to three additional counties and accelerate stove production and sales with new instruments for awareness raising and professionalization of producers.

Project Progress during Monitoring Period

The cookstove component continued to exceed its upwardly revised sales targets in 2019, with total average sales volumes nearing 5,000 monthly. Women led enterprises, accounting for 46% of all producers play a leading role and contributed more than 57% of sales. The performance-based support provided is well received by the producers participating in the project. Paired with tailored capacity and marketing support, 30 of these artisans have emerged as high performing 'TICS Champion's. Recent markets in Western-Central areas of Tanzania have maintained strong first year sales growth. In the new phase, TICS aims to reach nearly all counties in Tanzania, and has now initiated expansion of its programming to Southern areas of Tanzania. The Government of Tanzania continues to show support for cooking energy interventions in refugee-host communities in the Kigoma Region. A project commissioned by BMZ is active in this area, and the EnDev program has worked in parallel to support the introduction of the Matawi stove to this region with 20 active stove producers and intake of an additional 20 new producers during the reporting period. By close of 2019 producers in Kigoma are cumulatively nearing average monthly sales volumes of an additional 500 units. Alongside cooperation with TICS artisans, the program has been able to advance more than 1,650 stoves directly into refugee camp households.

Champions of Champions

Over the course of the later phase of the TICS program from 2017-19, the program has seen average producer monthly sales increase by nearly 40% relative to the initial 2013-17 period of the project. While this growth demonstrates substantial progress towards commercial viability of the traditionally informal cooking sector in Tanzania, program success has been guided by capturing and catalysing the entrepreneurial spirit driving leading cookstove producers.

Beginning in 2015, the project has recognized higher performing enterprises who typically double their annual sales as TICS Champions. As TICS has matured, Champions themselves have evolved with the emergence of leading enterprises pushing their annual sales growth upwards of 300-500% since their first intake in the program. These 'Champions of Champions' have excelled with identical levels of support as their TICS colleagues, but possess unique talents and ambitions motivating their accomplishments. EnDev has captured their stories as part of a series of online videos that celebrate the critical role local entrepreneurs play in the making cookstove markets work.

RBF Tanzania

RBF Stage 2: Rural Remote and Vulnerable Solar Market Development in Lake-Central Zones of Tanzania

The project has been active in Tanzania since 2013 and set up an RBF Fund with the goal of establishing markets for picoPV systems in the Lake and Central Zone Regions. In January 2019, EnDev launched Stage 2 of the Fund with a redesigned RBF incentive structure to increase private sector investment in more vulnerable and remote market localities in the Lake and Central Zone. With three (3) claim submission cycles to the RBF Fund in 2019 now completed, some firms appear to have started shifting greater sales activity from less to towards more vulnerable markets.

Calls for proposals have continued through the second half of 2019. Thirteen firms have been selected for the new phase of the RBF project (6 renewals, 7 new intakes). So far, five firms have submitted claims, with a cumulative sales volume of 16,243 units and a total verified incentive value of EUR 437,008 in the period of January-December 2019 (11,966 units and EUR 328,820 in the July-December 2019 period). Since inception, the RBF fund to date has supported verified sales of 95,615 solar systems with the incentive disbursement of a total of EUR 2,326,411.

During the reporting period, the government of Tanzania has reiterated their reservations about economic activity in refugee settlements. While the project continues to support the market entry to Kigoma with humanitarian bonus incentives, the private sector remains highly cautious and hesitant to make investments in Kigoma region.

RBF Learning Points

For the 2019-2020 period, RBF incentives are paid to firms in two separate instalments. The first payment is based on verification of Consumer Product Sales (CPS) and is paid upon verification of initial sales. The second instalment is paid to firms 4-6 months after the first payment upon verification of customer satisfaction to gauge the extent of Sustainable Market Investments (SMI) made by firms.

In bringing on consumer experience as a measurable performance result eligible for RBF incentives, the project has simplified verification practices by the use of Lean Data methodologies. These practices enable the program to consistently benchmark private sector performance in multiple spheres so that firms can be compared not only to their peers in the RBF Fund, but also a broader array of energy companies internationally. With the Lean Data services of 60 Decibels, EnDev has learned that compared to solar industry norms in East Africa, RBF firms have demonstrated stronger customer loyalty with nearly double the outreach to consumers living in poverty. SMI Lean Data will play a valuable role to enriching feedback on customer satisfaction to RBF companies in 2020.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of Beneficiaries	600,500	456,775
EUR per Beneficiary	9.69	8.71
CO_2e Avoided	31,349	20,564
EUR per t CO_2e Avoided	200.96	193.58
Private Sector Leverage Ratio	6.7	5.8
Jobs Created	970	940
Jobs Created thereof Women	240	121
Enterprises Created/Upgraded	18	11
Technologies Deployed	picoPV	picoPV

Uganda

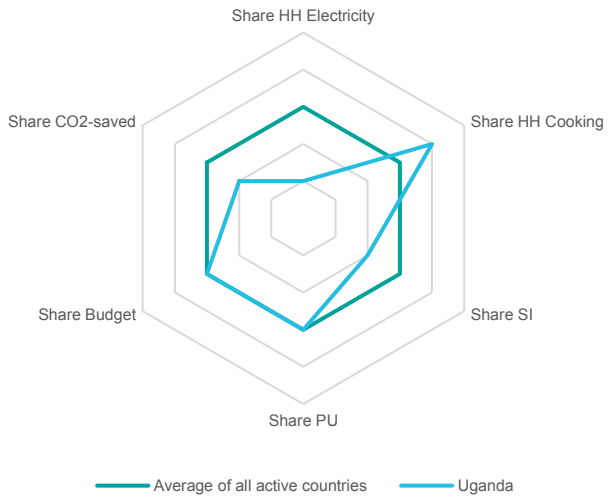
Country Facts

Population	42.7 million
Human Development Index	159 ↑ | Total (0.53)
UN Classification	LDC / LLDC
Access Clean Cooking	< 5 %
Access Electricity	22.0 %

Project Facts

Project Period	04.2009 - 06.2021
Budget	EUR 14,043,000
Core Funding incl. RBF	EUR 14,043,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 923,965
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Energy and Mineral Development (MEMD)

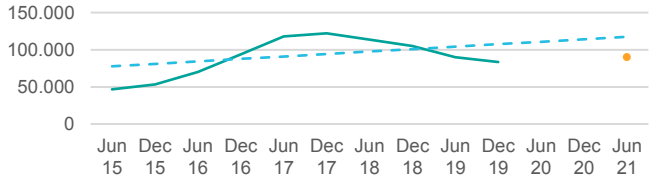
Relevance



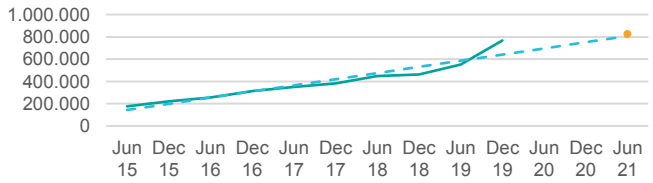
Project Results

	Targets	Achieved
HH Access Electricity	90,000	83,441
HH Access Cooking	825,000	767,491
SI Access	1,450	788
PU Access	3,750	1,857

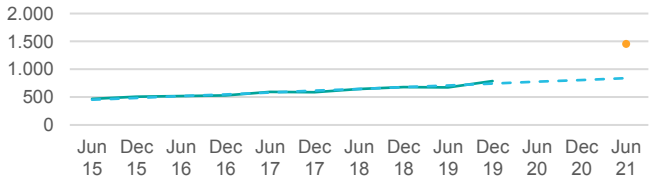
HH Access Electricity



HH Access Cooking



SI Access



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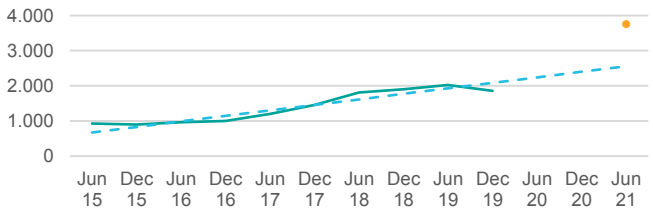


Semi-industrial stove production: quality made in Uganda


@ GIZ/EnDev Uganda

Background Information

In the new phase (09/19 to 06/21), EnDev focuses on market-based access to off-grid solar systems for PU and SI, and charcoal and firewood improved cookstoves for households and PU. EnDev continues to offer performance-based partnerships for producers and distributors, capacity building, awareness creation and fostering an enabling environment. This includes supporting national alliances, e.g. to establish a PU competence cluster, and the acceleration of sector transformation on policies, strategies and standards. In refugee settings, EnDev introduces market-based approaches for sustainable household energy access via energy kiosks and solar PV for SIs and supports the improvement of framework conditions for sustainable energy access.

Project Progress during Monitoring Period

During the monitoring period, cooking energy access numbers rose from 815,600 to 1,137,000 people, a net increase of 321,400 people, largely caused by the strong performance of a charcoal stove distribution consortium led by UpEnergy, and a firewood distribution partnership with International Lifeline Fund, where the project targets were surpassed.
Several challenges continued to affect the performance of the solar sector partners, including issues regarding credit management (for their pay-as-you-go portfolio), uncertainties regarding tax exemptions and high competition from low-quality products on the market. This led to a drop-in access figures from 107,500 to 100,000 people. The school campaign of Village Power on the other hand showed strong growth, increasing SI access figures from 817 to 943 social institutions, despite operating in a difficult market.

The closure of previous performance-based partnerships that also supported ICS in restaurants and canteen kitchens has impacted the PU number leading to a small reduction from 2,697 to 2,446 SMEs.
Overall, total access figures have risen from 923,000 to more than 1,237,000 people.

EnDev RBF Lite Approach Boosts Stove Distribution

Following the pilot of a RBF Lite approach by EnDev Uganda in 2017, the approach was scaled up in 2018 by two new stove distribution partnerships: a consortium of 4 companies led by UpEnergy for charcoal stoves, and a firewood partnership with International Lifeline Fund.

As a result, achievements included:

1) Distribution and sale of over 157,000 improved charcoal stoves, and 10,000 improved firewood stoves
2) Establishment of over 10 jointly managed distribution hubs across all of Uganda penetrating new markets
3) New jobs created for over 20 new direct sales staff
4) Over 1,150 retail partners provided with additional income streams
5) SME producers and distributors supported by consortium members to formalize their businesses.

Vietnam

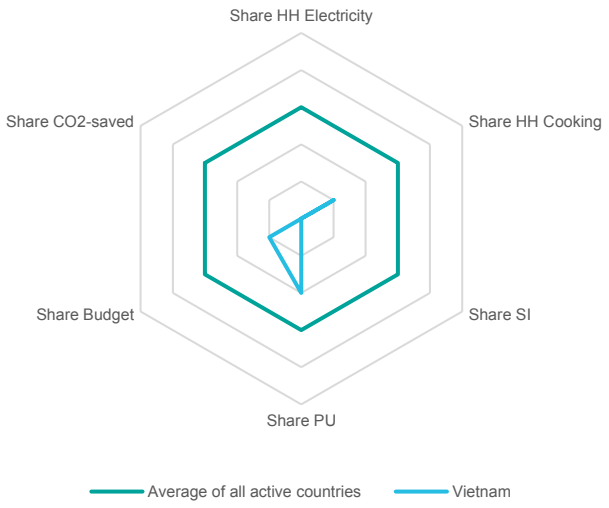
Country Facts

Population	95.6 million
Human Development Index	118 ↓ | Total (0.70)
UN Classification	
Access Clean Cooking	70.0 %
Access Electricity	100 %

Project Facts

Project Period	07.2013 - 12.2020
Budget	EUR 4,432,000
Core Funding incl. RBF	EUR 4,432,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 473,189
Implementing Organisation	SNV+GIZ
Lead Political Partner	Ministry of Agriculture and Rural Development (MARD)

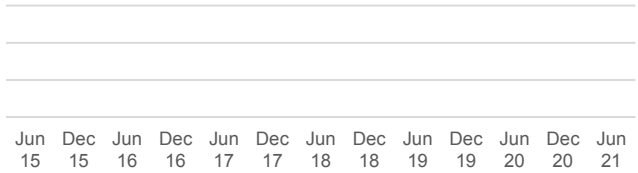
Relevance



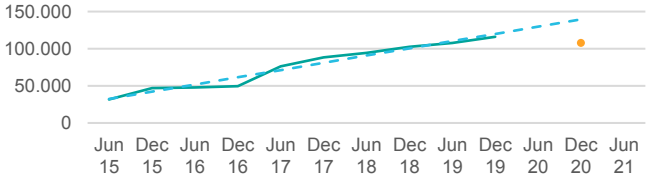
Project Results

	Targets	Achieved
HH Access Electricity	0.0	0.0
HH Access Cooking	107,700	116,043
SI Access	0.0	0.0
PU Access	880	1,428

HH Access Electricity

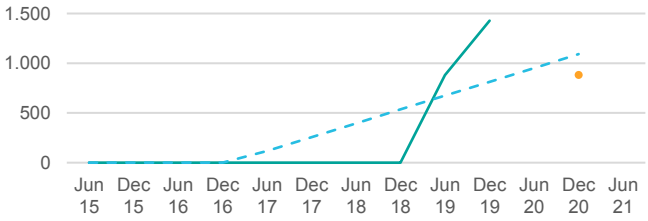


HH Access Cooking



SI Access

PU Access



Innovation Fund prepares biogas sector for continued market development

SNV Vietnam

Background Information

The EnDev program in Vietnam aims to transform the biogas sector into a private sector driven market. Through the application of an RBF mechanism, sector functions and responsibilities such as marketing, end-user training, and after-sales services are increasingly transferred to market actors, and entrepreneurial capacities are built. In total, 252 Biogas Enterprises (BEs) have been active in the RBF scheme by the end of 2019, taking over many of the sector tasks and expanding the market to 40 of out 63 provinces. In the final programme year, 2020, the amount of RBF incentive will be reduced by half and applied to all provinces to prepare BEs for the phasing out of this instrument, and to complete the transition of the sector towards a full commercial status.

Project Progress during Monitoring Period

Up until November 2019, 4,232 biodigesters (3,606 composite and 626 brick digesters) have been verified and were paid out (3,514 'full RBF', 718 'phase-out RBF'). In 2019, the program covered 40 provinces with 120 active BEs. The African Swine Fever, hitting all 63 provinces of Vietnam since last February, led to culling of 5.8 million pigs and affected millions of small pig raisers. Despite this disaster, 3 BEs reached their annual sales target of over 200 digesters, and 6 professional BEs built more than 100 digesters each. Two provinces, Thanh Hoa and Tra Vinh, continued their 2018 highest ranking sales with 633 and 708 digesters constructed in 2019 respectively. Training was the main activity of the year with 10 advanced training courses provided by the program, focussing on capacity building for 22 Independent Quality Controllers and 184 BEs, equipping BEs with advanced knowledge on bio-slurry utilization and effective sales and after-sales service skills to become more adaptive and professional in the competitive market. The program also conducted 5 quality control trips to 7 provinces, checking 124 digesters to ensure quality of services provided by the program. The newly introduced RBF incentive for biogas sharing rewarded 14 BEs for the first 73 households connected to a biogas mini-grid. The Gold Standard issued 709,000 new carbon credits, revenues of which will add to the program's 2020 budget.

- Biogas Innovation Fund - Planting seeds for further market development

In June 2019, the program launched the 'Biogas Innovation Fund (BIF)' to support new biogas use applications in new market segments. A mid-term workshop in December showed that the private sector made good use of the fund: (1) A new digester prototype for food waste was tested with 30 households; (2) A large community-based biogas sharing systems of 1,500m³ successfully connected 37 households living near a pig farm to clean cooking gas; (3) Tube HDPE digesters were installed and tested with wastewater from shrimp farms in the Mekong Delta; (4) A financing modality for biogas-based electricity generators was tested in which the private sector shall Build, Operate and Maintain the biogas power system while farms enjoy low energy cost without initial investment; (5) A biogas heating system developed by Ha Tinh public university installed for a pig farm shows high potential for scale up; (6) 20 units of a large 17m³ composite digester, triple the size of a typical digester, was tested on animal and shrimp waste. While not all BIF projects have come to success yet, the interim results certainly indicate good potential for further private sector led market development in new segments.

Regional RBF: Bangladesh and East Africa

Accelerating the uptake of off-grid solar technologies with RBF in Bangladesh, Kenya, Rwanda, Tanzania and Uganda

All administrative activities associated with the second round of the RBF project were completed. A total of 264,852 combined TV, Fan and Refrigerator products were verified as sold to end consumers in Bangladesh (6,837 TVs; 189,150 fans) and East Africa (68,512 TVs; 353 refrigerators).
The winners and finalists of the 2019 Global LEAP Awards Solar Water Pump and Off-Grid Refrigerator Competitions were announced on 22nd of October 2019. Off-grid solar distributors interested in participating in the RBF project were invited to submit an expression of interest. This helped the project to ensure that participating distributors possess the requisite capacity, interest and access to working capital to undertake large-scale appliance procurement.

Incentives for off-grid refrigerators and solar water pumps (SWP) were then made available through a competitive bidding process open for a limited time period. CLASP administered two competitive bidding windows tied to the announcement of winners and finalists of the 2019 Global LEAP Awards Competition. Bids were evaluated on a variety of criteria including their value for money and company's ability to provide necessary support and training to end consumers. A total of 72 bids were placed for procurement of over 34,000 projected SWP and refrigerator sales, exceeding the total available incentive amount by eight-fold.

Project Facts	
Project Period	03.2015 – 09.2020
Approved Budget	EUR 6,230,000
Spent till 06.2019	EUR 4,340,246
Implementing Organisation	CLASP
Lead Political Partner	Bangladesh: Infrastructure Development Company Ldt. (IDCOL) East Africa: not applicable

RBF Learning Points

Access to pre-financing remains a critical need for both large- and small-scale companies looking to set up or expand their market share in the solar appliance sector. SWP and refrigerators are still quite nascent technologies and represent a huge financial investment for the targeted consumers who are mostly located at the bottom of the pyramid.
Oversubscription of the incentive bidding windows suggest two things:

- the project coupled with the first ever independent product quality verification process is timely in attempting to address market barriers for supporting growth of the nascent SWP market,
- the industry needs significantly greater financial support to grow.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	1,138,254	1,526,814
EUR per beneficiary	5.47	2.84
CO_2e avoided	148,214	-
EUR per t CO_2e avoided	42.03	-
Private sector leverage ratio	13	18.6
Jobs created	300	264
Jobs created thereof women	45	65
Enterprises created/upgraded		39
Technologies deployed	259,953	328,303

D.2 Phasing out projects – status

- Cambodia
- Indonesia
- Regional RBF: Kenya, Uganda & Tanzania
- Regional RBF: Sub-Saharan Africa

Cambodia

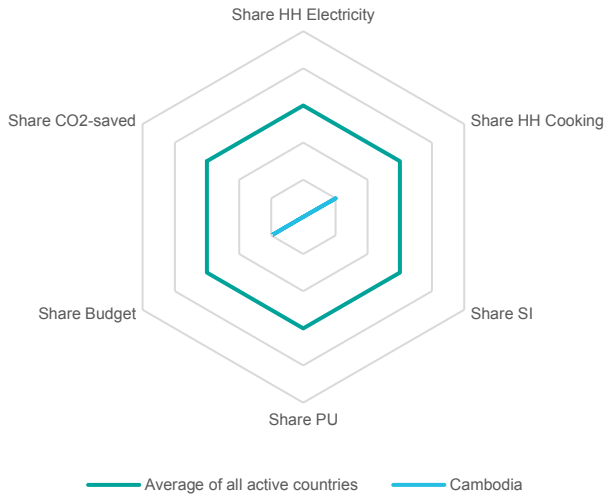
Country Facts

Population	16.3 million
Human Development Index	146 ↓ | Total (0.59)
UN Classification	LDC
Access Clean Cooking	20.0 %
Access Electricity	89.1 %

Project Facts

Project Period	12.2012 - 11.2019
Budget	EUR 3,150,000
Core Funding incl. RBF	EUR 3,150,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 220,683
Implementing Organisation	SNV+GIZ
Lead Political Partner	Ministry of Mines and Energy

Relevance

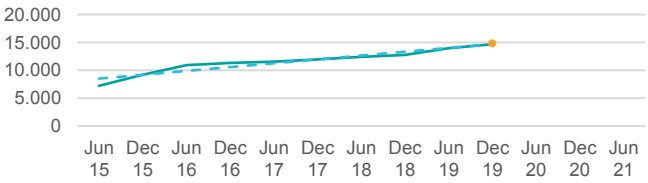


Project Results

	Targets	Achieved
HH Access Electricity	0.0	0.0
HH Access Cooking	14,850	14,673
SI Access	0.0	0.0
PU Access	0.0	0.0

HH Access Electricity

HH Access Cooking



SI Access

PU Access

Launching the world's first PAYGO biogas system


SNV Cambodia

Background Information

In an effort to strengthen the role of the private sector in the Cambodian biogas market, EnDev through its 'Biogas Enterprise Development Program' focuses on supporting the development of essential production and distribution structures of newly emerging biogas enterprises. The program offers financial support to biogas enterprises through a Results-based Financing (RBF) fund. In order to accelerate new biogas enterprises' establishment in the Cambodian market and support them towards joining the RBF scheme, the program offers a range of support mechanisms. These include 'Enterprise Development Grants' for targeted early-stage co-investments in new market entrants, 'Biogas Innovation Grants', and a 'Biogas Expert Fund'.

Project Progress during Monitoring Period

In the lead-up to the program's scheduled closure in November 2019, sector support activities gradually phased out. A final set of technical assistance services was provided to prepare the biogas enterprises to continue scaling their business activities in the future. This included a final round of co-investments in two enterprises, which led to the launch of a new PAYGO consumer financing modality [see insert box] and the business registration of a new biogas enterprise in Siem Reap province. The program's RBF scheme also continued verification and pay-out of claims up until November. To document the program's experiences and lessons, and prepare knowledge transfer to local stakeholders, a range of knowledge documentation activities took place. This included a final biogas user survey that offers longitudinal findings on the durability and user acceptance of the novel digester technologies promoted by the program. This also included a research project with the Cambodian Institute of Technology on the economic value of bio slurry.

Preparation of a program closure publication is also currently underway. While the program made important contributions towards developing scalable commercial biogas endeavors in Cambodia, sector barriers such as unevenly applied tax regulations, subsidy schemes, and quality standards remain and deserve attention in future sector development initiatives.

Launch of world's first biogas PAYGO system

In order to improve the affordability of a biogas system for rural farmer households, EnDev-supported biodigester enterprise ATEC launched in Cambodia, what has been dubbed "the world's first pay-as-you-go biodigester system to increase clean energy access for farmers". With the scheme, households that are unable to pay for the cost of a biodigester upfront can opt for instalment payments and avoid using microfinance loans. EnDev's 'Biogas Enterprise Development Program' contributed to the launch of the modality by making co-investments in PAYGO hardware development, technical staff back-end capability development and payment app integration, and a national media campaign. ATEC has since raised the working capital required to pre-finance the scheme through a Series B debt investment round of USD 1.6m. The scheme has been hailed a "game changer in the energy access sector, aiming to replicate the successful experience of the off-grid solar industry". By offering flexible payment schedules, the company hopes to allow as many people as possible to benefit from a biodigester, and increase ATEC's scalability. Sales activities to date have already seen a doubling in lead conversion rates.

Indonesia

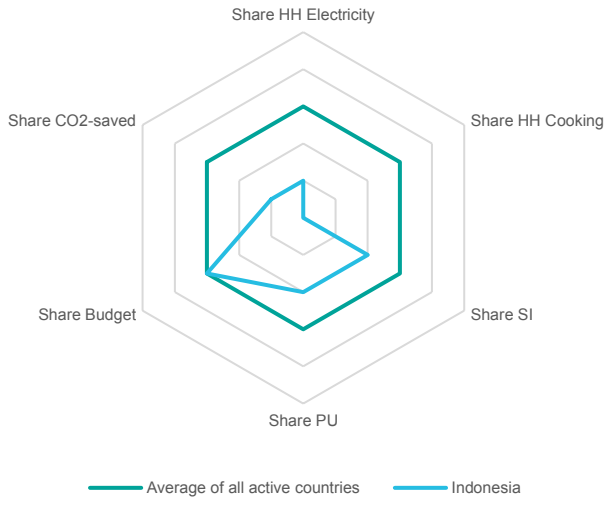
Country Facts

Population	267.7 million
Human Development Index	111 ↑ | Total (0.71)
UN Classification	
Access Clean Cooking	65.0 %
Access Electricity	98.1 %

Project Facts

Project Period	05.2009 - 09.2019
Budget	EUR 12,800,000
Core Funding incl. RBF	EUR 12,800,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 535,635
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Energy and Mineral Resources (MEMR)

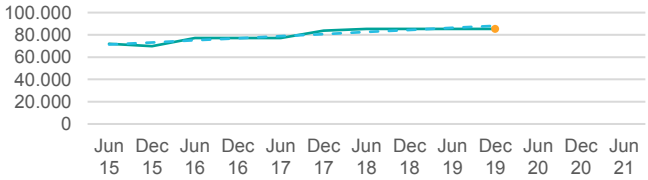
Relevance



Project Results

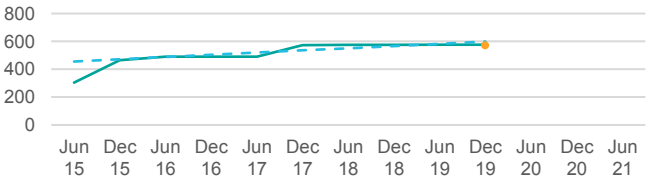
	Targets	Achieved
HH Access Electricity	85,350	85,351
HH Access Cooking	0.0	0.0
SI Access	570	576
PU Access	1,060	895

HH Access Electricity

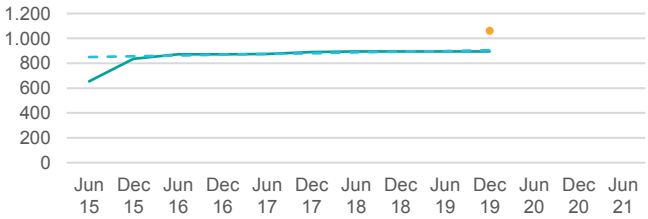


HH Access Cooking

SI Access



PU Access



Private sector participations in rural electrification

Background Information

Indonesia targets to achieve 99.9% electrification ratio in 2019 and have 23% renewable energy in the energy mix by 2025. To achieve the target, the Indonesian government has been conducting a rapid micro-hydro power development and solar mini grids as well as disseminating thousands of solar lanterns to remote areas. Despite many electrification initiatives, challenges arise from quality assurance, operation and maintenance, accessible technical assistance up to slow adoption of electrical appliances to foster economic development. Many public and private sectors are testing various schemes to solve the hindrances and penetrating to the non-electrified area, to show that are other strategies available. Perusahaan Listrik Negara (PLN, the state-owned utility) is now playing major role in renewable mini grids development. The government is also pushing more private sector participations in rural electrification.

Project Progress during Monitoring Period

EnDev focuses to enhance sustainability by optimising the use of their solar mini-grid systems. EnDev uses the **Energy Access Beyond Lighting** (ENACTING) theme to communicate the range of activities which comprise of productive use of energy, multi-stakeholder collaboration, technical service provider, technical assistance and innovations, and promoting gender equality. EnDev opts to work intensively with key stakeholders in the provincial area. Five villages from two provinces were chosen after a rigorous selection process considering cooperativeness, density of mini-grid systems, economic potential, and accessibility. Currently, EnDev has been assisting 13 groups of women-led rural businesses from identifying promising products and services to marketing strategy through training and peer-to-peer learning.
Accessible skilled technicians and industry supports are vital thus business to business partnership between them is created despite the struggle to find accessible financing. In addition, a universal remote monitoring system and smart payment system are ready to be deployed on the pilot sites through better monitoring and electricity utilisation.

Remote Monitoring System introduced

Enabling sustainable rural infrastructures demands dedicated commitment and supports from various stakeholders. The beneficiaries, relevant public officials, and privates must be continuously engaged with the goal whilst enjoy the exchange process. This process is catalysed by an online chat platform where knowledge exchange happens in real time. Also various offline events, namely visits to the exemplary village who has successfully grown business using solar mini-grids as well as practical training to produce sea and agricultural products.
Driven by slow adoption of electrical appliances that hinders solar mini-grid performance, EnDev has been developing a universal monitoring system that can work regardless of their type of inverters and a smart payment system that can work in areas without internet coverage. These technologies are developed in-house whilst collaborating with a university and a start-up company for further production. Despite the readily available products to address the similar problem, EnDev innovates on how to be more fit to the Indonesian users and increase its adoption.

Regional RBF: Kenya, Uganda & Tanzania

Regional RBF: Biogas Business Boost Benefitting Farmers (4BF)

The RBF project is implemented under the umbrella of the Africa Biogas Partnership Programme (ABPP) phase II in Kenya and Uganda. The aim of EnDev is to accelerate the market uptake of biogas for energy generation by incentivizing private sector actors through (1) a sale incentive and, (2) a quality plant incentive (QPI). The additional income is supposed to stimulate enterprises to construct high-quality digesters and offer good after-sales service (AFSS) and customer care.

In the second semester 2019 the production numbers in Uganda increased significantly from 53% to 113%. As part of ABPP, support of the Biogas Enterprise Acceleration Facility (BEAF) initiative played a major role in the increase of production figures. BEAF provides amongst others coaching and mentoring to the biogas construction enterprises and masons, which enables them to turn their business into more profitable ventures.

In Kenya production numbers dropped slightly compared to the first semester. The main reason for the declining demand were on the one hand an unfavourable economic circumstance for dairy, tea and coffee farmers, which caused low pay-outs, and on the other hand a severe drought, which affected farm productivity in East Africa. This, in turn, had an impact on the purchasing behaviour of households who invested more in basic household needs.

In the reporting period, sales incentives for 1,600 plants (935 Kenya and 665 Uganda) and QPI for a total of 1,273 plants (750 Kenya and 523 Uganda) were disbursed.

Project Facts	
Project Period	03.2015 – 12.2019
Approved Budget	EUR 1,641,498
Spent till 06.2019	EUR 1,489,644
Implementing Organisation	HIVOS
Lead Political Partner	Kenya: Ministry of Energy and Petroleum; Renewable Energy Directorate Uganda: Ministry of Energy and Mineral Development (MEMD)

RBF Learning Points

The biogas construction enterprises continued to report on good customer relationships thanks to after sales services incentivized by the QPI. Additional service providers also play a big role in offering technical support to farmers in case of operational issues. This implies that enhancing customer relationships initiated by the RBF project does not only benefit end-users but also the service sectors, which is enabled to expand and scale their businesses. Thereby, it may be concluded that the RBF project not only has an impact on the development of the biogas sector but also a spill over effect on the service sector.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	36,132	44,452
EUR per beneficiary	50.79	22.79
CO_2e avoided	540,781	583,926
EUR per t CO_2e avoided	3.39	1.73
Private sector leverage ratio	3.2	5.0
Jobs created	488	170
Jobs created thereof women	29	11
Enterprises created/upgraded	61	267
Technologies deployed	7,622	8,231

Regional RBF: Sub-Saharan Africa

Sub-Saharan Grid Densification Challenge Fund

The grant agreement between EnDev Mozambique and Electricidade de Mocambique (EDM) came to an end as planned in June 2019. With a total of 13,497 verified connections, the grid densification challenge in Mozambique achieved 78% of its final target. These results also include connections in the region of Beira, which has been affected by the tropical Cyclone “Idai” in March 2019. The RBF project closed as planned by the end of September 2019.

Rwanda reached a target achievement of 30% with a total of 4,453 connections validated and eligible for incentive payment until the end of 2019. The political partner in Rwanda Energy Development Corporation Limited (EDCL)and the Ministry of Finance and Economic Planning (MINECOFIN) have respectively requested a time extension for the implementation of the RBF project component until February 2020 to enable a target achievement of 100%, corresponding to 14,800 planned connections. The main reason for the delay is more time than anticipated which was required for procurements of equipment needed to connect remote households.

Uganda reached a target achievement of only about 5% (500 connections) until the end of 2019 and requested a time extension until February 2020. Some of the involved energy service providers faced challenges in financing needed material for the planned connections. Therefore, Rural Electrification Agency (REA) onboarded new partners, who delivered a large claim towards the end of the year 2019. The time extension is needed to undergo the full verification and validation cycle before incentives are disbursed.

Overall and by the end of 2019, the Grid Challenge has reached a target achievement of 33% with a total of 14,176 connections equalling 72,686 people with access to renewable energy services.

Project Facts	
Project Period	03.2015 – 12.2019
Approved Budget	EUR 3,283,000
Spent till 06.2019	EUR 49,609
Implementing Organisation	GIZ
Lead Political Partner	Rural Electrification Agency (REA, Uganda), Electricidade de Moçambique (EdM, Mozambique), and Energy Development Corporation Limited (EDCL) through the Ministry of Finance and Economic Planning (MINECOFIN), Rwanda

RBF Learning Points

The RBF learnings reported in the last report are still valid. The time required for contractual processes and approvals of RBF contracts that follow an output-based aid approach with partner government institution needs to be taken into account. It is crucial to assess jointly with the private partners their priorities, processes, timelines and expectations to deliver a realistic work plan.

RBF Key Performance Indicator (KPI)	Target	Achieved
Number of beneficiaries	207,963	72,686
EUR per beneficiary	15.79	0.68
CO_2e avoided	54,776	18,581
EUR per t CO_2e avoided	59.94	2.67
Private sector leverage ratio	1	2.9
Jobs created	4,450	-
Jobs created thereof women	1,650	-
Enterprises created/upgraded	-	-
Technologies deployed	41,750	14,176

D.3 Finalized projects – evaluation brief

- Burkina Faso
- Central America
- Ghana

Burkina Faso

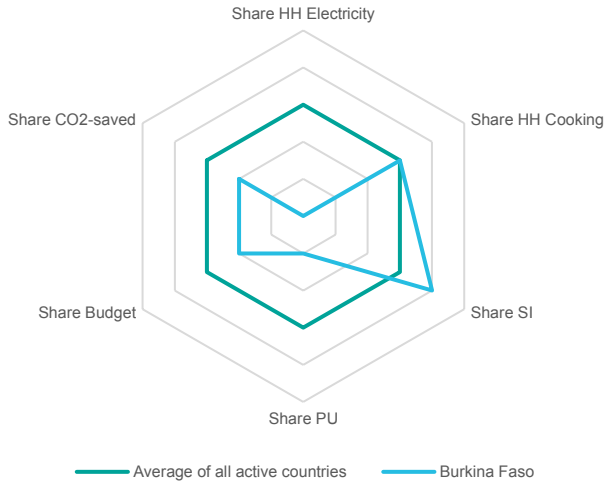
Country Facts

Population	19.8 million
Human Development Index	182 ↑ | Total (0.44)
UN Classification	LDC / LLDC
Access Clean Cooking	10.0 %
Access Electricity	25.5 %

Project Facts

Project Period	06.2009 - 09.2019
Budget	EUR 6,970,000
Core Funding incl. RBF	EUR 6,970,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 857,167
Implementing Organisation	GIZ
Lead Political Partner	Ministry of Environment, Green Economy and Climate Change

Relevance

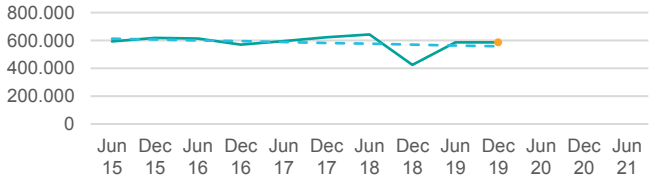


Project Results

	Targets	Achieved
HH Access Electricity	0.0	0.0
HH Access Cooking	585,600	585,645
SI Access	1,600	1,609
PU Access	500	503

HH Access Electricity

HH Access Cooking



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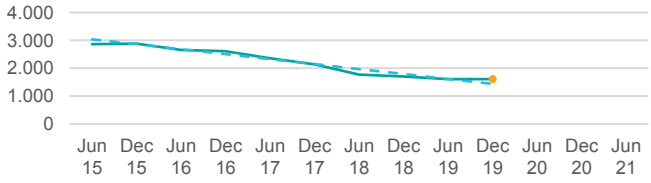

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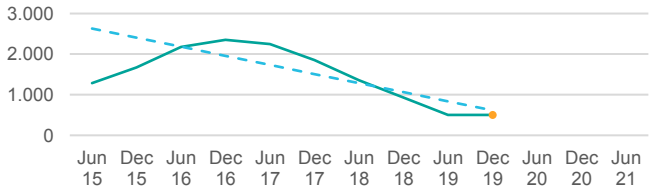


Introduction

Burkina Faso is one of the least electrified country globally, with a national electrification rate of 19%. The main source of energy for most of its population is wood energy. Wood fuel and charcoal account for over 90% of its household energy consumption. Due to the extent of poverty, the use of modern energy remains very low and is mainly concentrated in urban areas.
From 10.2009 to 09.2019, the project aimed to strengthen the foundations of a viable market for quality ICS, and to promote an efficient use of ICS by beneficiaries.
The main target group of the action were households, SME and SI in rural and peri-urban areas. Another important target group were the actors in the ICS sector, especially producers and resellers. This rather informal sector was generally characterized by a lack of professionalization on technical and business management levels, and by low and unstable levels of income. Finally, the project worked closely with the national research institute in applied sciences and technologies (IRSAT), essential for the effective management of the quality of ICS.

Relevance

The project was well aligned with the national and regional energy policies which aim at improving the efficiency of energy consumption, namely:

- Energy sector development policy letter (Ministry of Energy, 2000);
- Domestic energy strategy of Burkina Faso (CILSS/PREDAS, 2004);
- Strategy for accelerated growth and sustainable development for 2011 to 2015 (STN/SCADD, 2010);
- Energy sector development policy letter 2014-2025; and
- SE4ALL country action plan to reach by 2030 universal access to clean cooking solutions in urban areas, and 65% in rural areas.

To suit to the priorities of the target groups, EnDev promoted technologies that were affordable, energy-efficient, produced locally and adapted to the needs of households, SME and SI.
The communication channels used (commercials, radio messages in local languages, theatre plays, cooking demonstrations, etc.) were well adapted to the target group.

Effectiveness

- On the demand side, EnDev facilitated sustainable access to modern cooking technologies to an adjusted number of 585,600 households, 503 SME and 1,609 SI throughout 13 administrative regions. The network of ICS resellers remains however still limited, and needs to be strengthened and extended, especially in rural areas. Poor people are also likely to be under-represented in the target group, as the ceramic ICS which meets their purchase power represents less than 20% of total ICS sales.
- On the supply side, EnDev provided marketing and entrepreneurship trainings that improved the performance of 1,800 producers and 300 resellers. Additionally, EnDev consolidated the professionalization of 5 large production units with organizational trainings, equipment and infrastructure. The trainings delivered the expected effects on the metal ICS producers; most of them produced and sold ICS which respected the “Roumdé” label (see next bullet). However, the ceramic ICS producers supplied in small quantity due the seasonal access to raw material, the lack of expertise in some ceramic processes (such as clay preparation and firing techniques), and the damages of ceramics products during transport. In general, the professionalization of ICS actors remains at an early stage, and the

geographical distribution of producers is still limited to supply local markets in quantity. In general, the professionalization of ICS actors remains at an early stage, and the geographical distribution of producers is still limited to supply local markets in lower quantities.

- On the enabling environment side, EnDev developed in collaboration with IRSAT the ICS quality label " Roumdé " which positively impacted the purchase intention of consumers in Burkina Faso, and beyond in Mali, Niger and Ghana. Furthermore, Endev strengthened the capacities of the National Federation of ICS artisans of Burkina Faso (FNAB) and ICS business associations to sustain the quality control and market viability. However, they are still at an early stage of development, and there is room for improvement left.

Efficiency

The cost efficiency of the project intervention decreased since 2015, and reached 11 EUR / person at project-end which is above the EnDev global average for cooking energy projects set at 8 EUR/pers. Serious implementation delays and increasing operation costs occurred during the political unrest in 2014 - 2015 after an uprising mass of demonstrators drove President Compaore from office , and then since 2016 with constant harassments from armed extremist groups. The partnership with the Ministry of environment, green economy and climate change faced several obstacles: it required more political will, resources, and coordination with all the actors at the national level to build synergies and prevent overlapping activities.

Impacts

The sustainable provision of over 865,000 energy-efficient stoves since 2009 provided fuelwood savings (approx. 73,000 tonnes of firewood saved within a year), directly mitigating the pressure on deforestation, thus having a positive climate impact (approx. 79,000 tCO2 reduced within a year). The reduced deforestation also also contributed to combat desertification, which is a high priority in Burkina Faso.
The project results contributed to a socio-economic transformation through the generation of 238 full-time equivalent jobs in the ICS value chain (93% in the production and 7% in the distribution market segments).

Conclusion

While the ICS market development is at the expansion phase, the required growth of the sector still depends on investments through official development assistance. The long-term transformation of the sector will be achieved through a wider distribution network and an increased professionalization of the ICS actors. Additionally, the integration of the trainings into vocational education and training systems is recommended to provide a lifelong learning for continuous professional development in the ICS market.

Central America

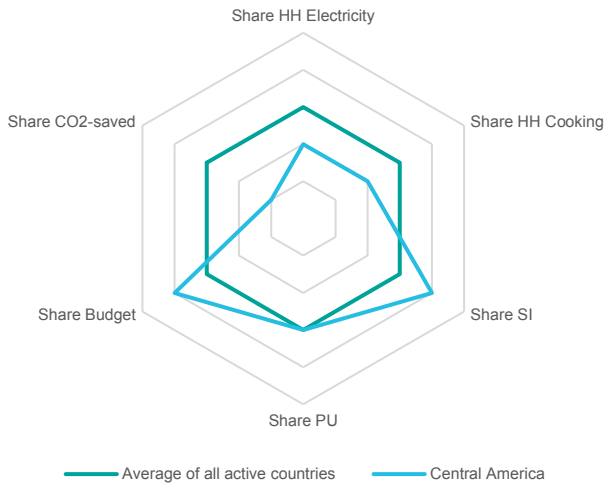
Country Facts

Population	HN: 9.6 million NI: 6.5 million GT: 17.3 million
Human Development Index	HN: 132 ↑ | Total (0.62) NI: 126 ↓ | Total (0.65) GT: 126 ↑ | Total (0.65)
UN Classification	
Access Clean Cooking	HN: 54 % NI: 54 % GT:43 %
Access Electricity	HN: 87 % NI: 87 % GT: 94 %

Project Facts

Project Period	09.2009 - 11.2019
Budget	EUR 17,640,000
Core Funding incl. RBF	EUR 17,640,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 1,094,635
Implementing Organisation	GIZ
Lead Political Partner	NI: Ministerio de Energia y Minas (MEM) HN: Insituto de Conservación Forestal (ICF)

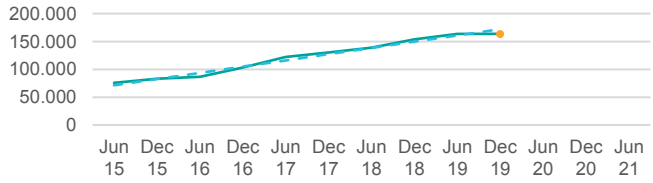
Relevance



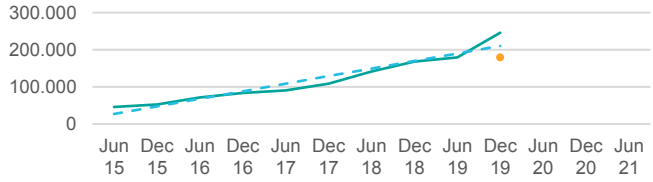
Project Results

	Targets	Achieved
HH Access Electricity	163,000	163,651
HH Access Cooking	179,300	245,788
SI Access	1,350	1,375
PU Access	2,150	2,073

HH Access Electricity



HH Access Cooking



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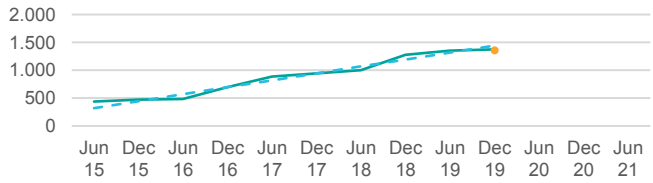

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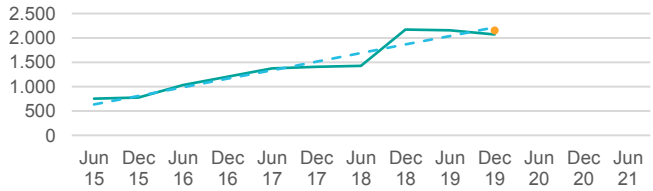


After 13 years EnDev Central America was phased-out by November 2019. The project has facilitated access to modern energy for more than 467,000 people, almost 1,500 social institutions and nearly 2,200 small and medium-sized enterprises (SME). In 2019 the project focused on transferring knowledge and experiences to partners on all levels in the public and private sector as well as to civil society organizations. The main findings of the evaluative review of the achievements of EnDev Central America are summarized below according to the OECD DAC evaluation criteria.

Relevance

EnDev Central America implemented interventions in Honduras, Nicaragua and to a smaller extend in in Guatemala. The three countries have in common a low population density, a significant number of low-income families and small-scale businesses lacking access to energy especially in rural areas. In line with national policy priorities, EnDev has contributed to bridging the gap towards achieving universal access to energy supporting a variety of technological solutions ranging from grid extension and densification, stand-alone solar home systems, hydro power mini-grid projects and improved cookstoves. For productive uses solar dryers and larger scale coffee dryers have been supported. EnDev´s interventions have been implemented in line with national priorities and policies on access to energy. The governments of Honduras and Nicaragua made enormous efforts on increasing access to energy in the past two decades. While these efforts resulted in a significant increase of the share of the population having access to energy today, especially in rural areas people are still struggling to get access to modern energy services. To highlight but a few activities, in Nicaragua, the project contributed to the implementation of the National Program for Sustainable Electrification and Renewable Energies (PNSER) and in Honduras, to the National Forestry Policy through the promotion of efficient biomass technologies. On meso- and micro-level EnDev worked in close cooperation with NGOs, producer associations, and companies. The project has been implemented in line with national policies and contributed its share to achieving universal access to energy on global level (Agenda 2030, SDG 7)

Effectiveness

Measuring EnDev Central America´s achievements against its targets, the overall assessment is positive with most targets overachieved (see table on page before). The project´s contribution to facilitating access to improved cooking is worth highlighting here with a total of 245.800 persons. Close cooperation with national programs, producer associations and NGOs on electrification (on- and off-grid) boosted results to 163.650 persons. However, the markets in Guatemala and Nicaragua show slow, but continuous growth. The Fondo Centroamericano para el Acceso a la Energía y Reducción de la Pobreza (FOCAEP) basket Fund established with EnDev´s assistance, will continue facilitating market development for improved cooking.

Efficiency

The efficiency of achieving its targets is measured against the EnDev benchmark on global program level, which gives as an orientation a benchmark for cooking energy of 7.5 euros per person reached, and 45 euros per person reached for access to electricity. In both cases EnDev Central America has been more costly per person compared to the benchmark. While this is a key finding, it is important to analyze the reasons, which underly these higher costs. The projects focus was on facilitating higher tier electricity access with significant

interventions in the field of grid extension and densification as well as mini-grids. In addition, the project worked on larger scale productive use of energy applications e.g. with large-scale coffee dryer machines. These more costly interventions in combination with the slow development of the cookstove marked caused the higher costs.

Impact

EnDev Central America has contributed to the global results in various impact areas. To highlight the contributions of the project, about 1.2 MW of off-grid power generation capacity and avoided at least 59.000 t of CO2 in total. In addition, women and children from at least 50.000 households benefited from improved health protection with improved cook stoves reducing indoor air pollution compared to traditional cooking habits. The project trained more than 500 electrician and stove producers and has leveraged about 11,6 million Euros from private and public sector being invested in the Central American energy access market.

Sustainability

Sustainability, ownership and capacity development have been embedded in the DNA of every intervention of this project. All activities have been implemented with a local partner (e.g. association, foundations, cooperatives, NGO or community) leading the project. EnDev´s emphasis was on transferring knowledge and building capacities over time from project start to the project end. Thereby energy and rural development topics have been institutionalized on local level. The Ministry of Energy of Honduras, and the Ministry of Energy and Mines of Nicaragua incorporated the experiences and lessons learned from 13 years of EnDev implementation into their energy policy and rural electrification approaches for off-grid areas.

Ghana

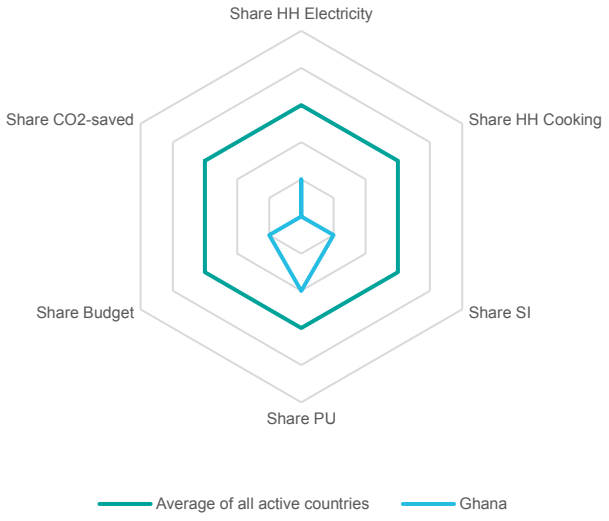
Country Facts

Population	29.8 million
Human Development Index	142 ↑ | Total (0.60)
UN Classification	
Access Clean Cooking	25.0 %
Access Electricity	79.0 %

Project Facts

Project Period	01.2010 - 09.2019
Budget	EUR 3,845,000
Core Funding incl. RBF	EUR 3,845,000
Earmarked	EUR 0.0
Average Annual Turnover	EUR 311,323
Implementing Organisation	GIZ+SNV
Lead Political Partner	Ministry of Energy (MOEn)

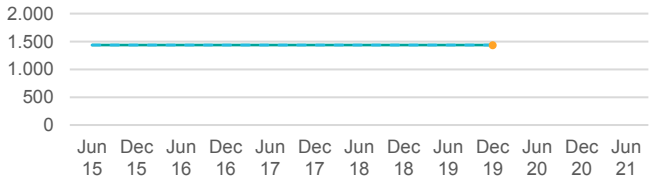
Relevance



Project Results

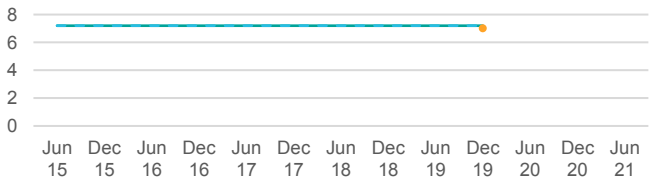
	Targets	Achieved
HH Access Electricity	1,430	1,436
HH Access Cooking	0.0	0.0
SI Access	7	7
PU Access	1,150	1,233

HH Access Electricity

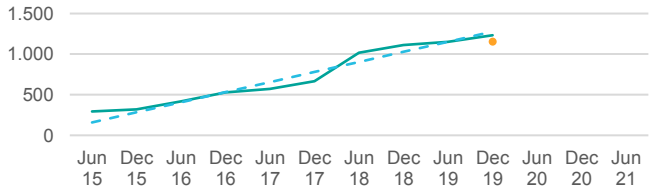


HH Access Cooking

SI Access



PU Access



EnDev Ghana was implemented between February 2006 and September 2019. It is the only project in the EnDev portfolio that focused on energy for productive enterprises (Productive Use of Energy). At first, the project consisted only of support for light industrial zones (LIZs) for micro, small and medium-sized companies (MSMEs). Benefitting entrepreneurs were mainly mechanics, metalworkers and wood-workers as well as associated suppliers and other service providers. Starting in 2014, three new components for grid-irrigation, solar irrigation, and thermal agro-processing were added, and the first component was closed, though the zones were monitored until 2016. The adjusted number of enterprises reached is 1,295. In addition, 1,770 households were connected in adjacent areas.

Relevance

The project was relevant to the development goals of the Ghanaian government. It also provided useful pioneering work and insights into how to support productive use of energy and into the linkages between improved energy access and enterprise growth. On the other hand, barriers in the political, economic and social environment that could not be resolved with the project approach limited the results and thus relevance of the components for grid and solar PV access. The component for thermal agroprocessing also had relatively limited results and thus relevance, mainly related to limitations in the approach and difficulties in implementation.

Industrial Zones: The light industrial zone (LIZ) component answered stated demands for better working conditions and energy provision by MSMES that were mainly working in cramped, inadequate conditions without tenure alongside roads or around market squares. It also improved energy provision in the affected towns, when the local light industry received a dedicated transformer and three-phase power and thus stopped overloading the residential grid. On the other hand, although 17 districts were supported, the zones have a relatively low average occupancy level, due to key barriers to the infrastructure development that could not be addressed with the project to make the envisioned growth in the LIZs possible.

Irrigation: The grid and solar irrigation components were also highly relevant to stated needs and goals of small farmers and the Ghanaian SEforAll targets. Energy for irrigation replaced polluting and expensive diesel or petrol pumps or heavy manual labor and allowed increased production of high-value horticultural crops for the domestic market or export. However, the solar irrigation component was not able to address poor small-holder farmers during implementation, as the technology remained too expensive for farmers with only 1-3 hectares. Similarly, the grid irrigation component made some progress in facilitating energy access for farmers, but uptake was slow, because small-holder farmers had difficulties paying for the irrigation system and the relatively expensive commercial activity tariff.

Thermal agroprocessing: Support to gari processors under the component for improved thermal agroprocessing with improved institutional stoves addressed relevant needs for gari processors (i.e. improved health, and less fuel costs for producers of this product, an important foodstuff derived from cassava). Yet, the evaluation indicates it was likely not the most relevant energy need in the gari value chain, and that addressing thermal agroprocessing in higher margin value chains or school feeding would have been more relevant and successful. Unfortunately, there is no certainty that the market for improved gari stoves will

continue. Also, thermal cooking needs in other value chains like shea butter, rice parboiling and school-feeding were not addressed as planned, which limits relevance.

Effectiveness

Although the target for overall MSMEs reached has now been met, two of four components did not reach their unadjusted goals. Implied objectives for upscaling were not achieved.

Industrial Zones: EnDev hoped that the LIZs would fill with companies during the project lifetime. This did not happen, although development continues slowly. Seventeen districts began developing a LIZ. In 2019, only 13 were operational. Nine had more than 20% occupancy, but only 7 exceeded 70% occupancy. This points to the many barriers to infrastructure development that could not be adequately addressed with the project approach, which required strong local ownership and local financing. The final target was at least 600 companies (adjusted numbers) with new electricity access. When monitoring ended in 2016, 1,203 companies were located at completed LIZ's, and 534 had an electricity connection. Yet, only 417 had "new" electricity access (i.e. they had not had any access to electricity before through formal or informal connections). OCS data, which adds the number of companies that came and went at the supported sites over the years, counts 567 companies reached with new access, but adjusts for sustainability to 395 companies.

Grid Irrigation: The final targets for grid irrigation were 625 connected farmers with new energy access. After sustainability adjustment, only 312 farmers were counted (although 462 farmers were connected, and 401 had "new" access, i.e. had not previously used diesel or petrol pumps). Farmers initially received a subsidy from the project, but as of 2017 the project relied on facilitation and technical advice alone. At this point, the uptake slowed and then stopped. Farmers had difficulty financing the irrigation system and the "commercial activity" grid tariff. Another barrier was lacking technical knowledge on the farmers part, which led to oversized systems and other design inefficiencies. The utilities do however, now also consider farmers in their planning as interesting customers, which was an objective.

Solar Irrigation: The solar irrigation component did reach its target (330 adjusted numbers of farmers with new energy access), although uptake also slowed after the subsidy was removed in 2017. End results counted 130 systems sold, of which 50 were micro pumps and the rest were larger systems, reaching 460 farms. Of these, 389 had only irrigated with manual labor before. After sustainability adjustments, 346 farms were counted as having new access to energy for irrigation. The implied objective of scaling up the market for solar irrigation for small-holders was not reached, but there are follow-on programs, although they likely will focus on larger farmers.

Thermal Agroprocessing: The target for the thermal agroprocessing component required 525 stoves to be sold. The target was reached, as 540 supported stoves for gari roasting were sold by August 2019 to 321 agroprocessors. After sustainability adjustments, 241 agroprocessors were counted as having sustained access to the improved technology. The results are however, quite modest compared to the estimated market potential of 50,000 gari-stoves in Ghana, or to the overall market for institutional stoves for agroprocessing and cooking. The component did develop a financing instrument for the stoves in cooperation with four local financial institutions, which was noteworthy, but the

instrument is not sustainable. Other objectives were to sell at least 50 of the 525 stoves for school-feeding, and to market a stove suitable for other agroprocessing value chains based on the 60 L pot (pito brewing, shea butter, rice parboiling), but no suitable stoves for these purposes were introduced or promoted, due to lacking technical and financial resources towards the project end.

Efficiency

There is no applied tool for measuring the actual cost of access for the companies in comparison to the cost for capacity building, facilitation, and work on an enabling environment. The total budget for the project over 13 years was EUR 3.845 million. Each year, the project required about EUR 296,000, which is modest for a small team with a large amount of field locations requiring trainings, facilitations etc. If project costs are divided by companies counted, each company supported cost slightly more than EUR 3,000 or closer to half of this (EUR 1,500) for all companies supported, including those that benefited from a tier improvement instead of only new access. Yet, most costs were for soft measures: capacity building and dialogue with private and public sector actors essential to addressing key business barriers, as well as with cooperation partners that continue lobbying for improved business conditions. This work will continue to benefit farmers and companies in the future, but the return on this investment has not been estimated.

Impact

EnDev Ghana was instrumental in several ways. The EnDev activities helped change mindsets at the national and district level about the role that informal micro- to small companies can play in supporting local growth and employment. In particular, the utilities began to see small companies as paying customers rather than a burden on their system and more district governments planned and budgeted for light industrial areas or other support for small enterprises and local value-added processing at the district level. EnDev also had a pioneering role to play for promotion of solar irrigation. The activities helped “demystify” solar irrigation, allowed the market to reach a nascent stage, and proved that it was suitable and workable even for smaller farmers, given appropriate technical assistance and some business and agricultural knowledge. This was achieved although the political, technical and economic conditions for promoting solar irrigation systems for small-farmers was still quite challenging. The sector is now set to grow further in Ghana, building on training materials, manuals, and data gathered by EnDev, and championed now by other government actors and development finance. The grid irrigation activities had some overarching policy impacts, but it continues to be financially unsustainable for smallholder farmers, and only becomes feasible for smaller “commercial farmers” near the grid. The component on improved cookstoves for productive use (thermal agroprocessing) had a more limited set of impacts than hoped, only for gari production. As noted, the future of the market for these stoves is uncertain.

Sustainability

Not all markets supported are expected to keep growing, or growing at the same rate, yet the technical assistance provided through EnDev will have long-lasting benefits in all areas. Specific to solar irrigation, concrete follow-on activities from the government and donors are foreseen. Also, the industrial areas already established will continue, and government policy now encourages local economic development planning including for industrial clusters and support for small enterprises, though more public investment

is needed. Overall on the macro-level, project partners will continue to support productive use of energy for MSMEs and farmers through policy and institutional support for local economic development. Additionally, the trainings offered to entrepreneurs and local public sector stakeholders on business skills, local economic development facilitation and profitable environmental management, among others, are still mentioned by beneficiaries as one of the main benefits of EnDev, which continue to generate positive impacts. On the downside, the policy framework is still not conducive to expanded grid irrigation for small farmers and hinders further uptake. Also, the market for improved institutional stoves for gari processing or other applications is not being addressed by other actors. If the one successful stove company is not able to continue to finance its stove production, which was in question during the project evaluation, the market will go down unless another actor introduces a suitable multi-purpose institutional biomass stove. Yet the overall enabling environment for improved institutional cookstoves is not conducive and would hinder sole private sector initiatives without other donor or charitable support.

Abbreviations

ABPP	Africa Biogas Partnership Programme
ADES	Association pour le Développement de l'Energie Solaire / Solar Development Association, Switzerland
AEPC	Alternative Energy Promotion Centre, Nepal
ASS	After Sales Service
AVSI	Association of Volunteers in International Service
BBF	Bangladesh Bondhu Foundation
BEAF	Biogas Enterprise Acceleration Facility
BIF	Business Innovation Fund
BMZ	German Federal Ministry for Economic Cooperation and Development
CAP	Country Action Plan for Clean Cookstoves
CCAK	Clean Cookstove Association of Kenya
CDM	Clean Development Mechanism
CES	cooking energy systems approach
CESPA	Cambodian Efficient Stove Promotion Association
CLASP	Collaborative Labeling and Appliance Standard Program
CPS	Consumer Product Sales
CREE	Community Rural Electrification Entities Nepal
DAC	Development Assistance Committee
DCHI	Dutch Coalition for Humanitarian Innovation
DEZA / SDC	Swiss Agency for Development and Cooperation
DFAT / AusAID	Australian Department of Foreign Affairs and Trade
DFID	UK Department for International Development
DGIS	Netherlands Ministry of Foreign Affairs Directorate-General for International Cooperation
DRC	Democratic Republic of the Congo
EDM	Electricidade de Moçambique/ Energy Public Utility, Mozambique
EnDev	Energising Development programme

ESMAP	Energy Sector Management Assistance Program
EU	European Union
FAA	Funded Activity Agreement
FASER	Fundo de Acesso Sustentável às Energias Renováveis / Renewable Energy Fund, Mozambique
FDC	Fundação para o Desenvolvimento da Comunidade / Foundation for Community
FGD	Focus Group Discussions
FI	finance institution
FNAP	National Federation of ICS artisans of Burkina Faso
FOCAEP	Central American Fund for Access to Sustainable Energy and Poverty Reduction
FTE	Full time employment
GBE	Grüne Bürgerenergie – Citizens' Green Energy Programme (BMZ)
GCF	Green Climate Fund
GHG	greenhouse gases
GIGA	German Institute of Global and Area Studies
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GTF	Global Tracking Framework
HH	households
HIVOS	Humanistisch Instituut voor Ontwikkelingssamenwerking / Humanist Institute for Cooperation with Developing Countries
IAP	Indoor air pollution
ICEIDA	Icelandic International Development Agency
ICS	improved cookstove
IDBP	Indonesia Domestic Biogas Programme
IICA	Inter-American Institute for Cooperation on Agriculture
IRS	Institutional Rocket Stoves
IRSAT	Institut de Recherche en Sciences Appliquées et de Technologie / Institute for Research in Applied Sciences and Technologies, Burkina Faso
ISO	International Organization for Standardization
ITAC	Independent Technical Advisory Committee
KOFIH	Korea Foundation for International Healthcare
KOSAP	Kenya Off Grid Solar Programme
KPI	key performance indicator

LDC	least developed countries
LIZ	light industrial zones
LLDC	landlocked developing countries
LV	low voltage network
MFA-NOR	Norwegian Ministry of Foreign Affairs
MFI	micro finance institution
MHDF	Micro Hydro Debt Fund, Nepal
MHP	micro hydropower
MTF	Multi-Tier Framework
NCSC	National Cookstoves Steering Committee, Malawi
NDCs	Nationally Determined Contributions
NIS	Nordic International Support Foundation
OAS	Organization of American States
ODA	Official Development Assistance
PA	Practical Action
PAYGO	Pay-As-You-Go
PE	Poly-ethylene
picoPV	pico photo voltaic
PNSER	National Program for Sustainable Electrification and Renewable Energies
PU	productive use of energy
QPI	Quality Plant Incentive
RBF	results-based finance
RF	Revolving Fund
RVO	Rijksdienst voor Ondernemend Nederland / Netherlands Enterprise Agency
SDG	sustainable development goals
SHS	solar home system
SI	social institutions
SIDA	the Swedish International Development Cooperation Agency
SME	small and medium-sized enterprise
SMI	Sustainable Market Investments
SNI	the Indonesia National Standards Agency
SNNPR	Southern Nations, Nationalities, and Peoples' Region in Ethiopia

SNV	Stichting Nederlandse Vrijwilligers / Netherlands Development Organisation
SREDA	Sustainable and Renewable Energy Development Authority
SREP	Scaling Up Renewable Energy Program in Low Income Countries
SSHS	small solar home systems
SWC	Social Welfare Council
SWH	solar water heaters
SWP	solar water pumps
TICS	Tanzania Improved Cook Stove programme
USAID	the United States Agency for International Development
VAT	value added tax
WHO	World Health Organization

References

Country facts in the portfolio analysis sheets were taken from the following sources:

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Access Electricity: The World Bank (2018), The Energy Progress Report 2018, p.110: https://trackingsdg7.esmap.org/data/files/download-documents/tracking_sdg7-the_energy_progress_report_full_report.pdf

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