Energising Development
Annual Planning 2021

endev

Energising change

Partnership between

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Nordic International Support Foundation (NIS)
Practical Action
Netherlands Development Organisation (SNV)

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Executive Summary

2021 will be kicked-off by another programming cycle building upon the second portfolio review. The review, as introduced with the EnDev strategy 2019-2021 and beyond was conducted in the second half of 2020. All country projects have been assessed by an external evaluator according to their performance and potential to generate impact and to contribute to SDG 7 progress.

The outcome of the portfolio review is presented in this document, proposing to continue with 18 projects in 21 countries. According to the categorization of a country and thus the (indicative) planning horizon for EnDev's involvement, country projects including their core implementing partner will be invited to submit a proposal allowing projects to further align their activities with EnDev's strategy. These proposals will be presented as part of the Annual Planning 2021 Update which will be submitted prior to the 24th Governing Board Meeting tentatively scheduled for May 2021.

The impact of the COVID-19 pandemic on EnDev is being closely monitored. The initial EnDev COVID-19 survey from April 2020, and the Energy Access Industry Barometer from July 2020, a survey conducted by EnDev in a strategic cooperation with key sector players, have shown that the effects of COVID-19 are heavily felt by energy entrepreneurs who are increasingly coming under financial distress. In order to cushion the financial stress of the private sector and mitigate losing ground on the way to achieving SDG 7, EnDev country projects have reacted by adapting activities to support energy access markets suffering from COVID-19 implications.

With Ethiopia, Mozambique, Senegal, Tanzania, and Uganda, five so-called fast-track countries were selected to offer additional short-term relief for energy access markets in need of support. This support is realized with additional COVID-19 related funding. If more dedicated additional funding would become available, EnDev would be able to expand its support to more countries in order to bridge the ongoing economic crisis and to sustain capacities to build back better.

In this *Annual Planning 2021*, proposed changes are as follows:

- For the country portfolio, a respective categorization of countries for medium-term or long-term involvement is proposed as a result of the Portfolio Review. While there are no fundamental changes, one EnDev multi-country project currently operating in three countries is proposed to be unbundled, resulting in three stand-alone EnDev country projects with long-term involvement in two countries and medium-term involvement in one country.
- For all EnDev country projects, project durations are proposed to be extended until 12/2021. Together with suggested transitional budget adjustments, this is intended to bridge the time towards the submission of the proposals as a result of the upcoming programming cycle and the subsequent Governing Board decision in the context of the 24th Governing Board Meeting tentatively scheduled for May 2021. The rationale behind these changes is to enable EnDev country projects to transition administratively while ensuring continuous implementation until additional funding will be allocated.
- For Ethiopia, Mozambique, Senegal, Tanzania, and Uganda an additional budget increase is proposed to allow for the implementation of COVID-19 relief measures (based on additional funding that has become available).
- For the "Off-grid appliance RBF" project a revised incentive design structure is proposed leaving project duration and budget unchanged.

A stove that changes more than the way of cooking

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

In 2014, Jamal Uddin opened his own restaurant in Nabinagar, a short distance from Bangladesh's capital. He worked from early in the morning until late at night so that his restaurant *Bismallah* can meet the demands of his hungry guests. However, he still found it hard to save enough money. One of his main expenses was for fuel: he spent the equivalent of 35 euros per day on gas cylinders. Jamal also used two traditional biomass cookstoves, an inefficient cooking method, which produced large amounts of smoke and was a health hazard for his employees. In 2018, Jamal learned about improved cookstoves and replaced his older cookstoves with two *Bondhu Chulas*. The improved cookstoves operate by burning biomass more efficiently, saving firewood and money. With EnDev's support, more than 2.6 million improved stoves have been sold in Bangladesh between 2005 and 2019 marketed and sold by more than 5,000 local enterprises. EnDev Bangladesh organises trainings for these enterprises and offers financial schemes to make the production and sale of stoves more attractive. With his two *Bondhu Chulas,* Jamal started to cut costs: Having paid the equivalent of 180 euros for both – the stoves paid for themselves within a month. He explains: "I feel good about the fact that I am not only saving fuel, but also have a clean cooking environment and my customers and employees are happy."

1. Portfolio development

2021 will be kicked-off by another programming cycle which is based on the results of the second full portfolio review. At the same time, the global pandemic COVID-19 continues to affect the development of the energy sector in EnDev's partner countries. Against this background, five fast-track countries are receiving extra support by EnDev via market-based approaches adapted to economic crisis triggered by COVID-19. The objective: Enabling key market players to weather the crisis in order to build back better.

1.1 Portfolio Review

Following the first portfolio review in 2018, a second portfolio review was conducted in 2020 for 16 EnDev country projects[1] which consists of a quantitative and qualitative analysis of relevance, strategic alignment, consideration of recommendations of the Independent Technical Advisory Committee (ITAC), performance, and potential. The portfolio review uses a systematic approach to describe, assess and categorise EnDev country projects considering the OECD DAC criteria. So-called Project Analysis Sheets (PAS) provide information on the following aspects:

- **Relevance:** providing country and project key facts at a glance – considering aspects such as economic situation, energy access situation, and co-financing
- **Strategic Alignment:** reflecting how country interventions have been aligned with EnDev's strategy – considering relevance, potential to contribute to paradigm shift, important collaboration towards scale, and gender
- **Consideration of ITAC recommendations:** elaborating if and to what extend ITAC recommendations have been fed into project implementation
- **Performance:** describing projects' performance over time – considering the effectiveness of providing access to energy for households, social institutions and productive use, as well as the cost-efficiency of interventions
- **Potential:** outlining projects' future potentials to contribute to sector transition and impact areas – considering the general potential to maintain or even improve past access performance in the context of sector and market conditions and trends, as well as reflecting on project's alignment with national policy and the impacts of COVID-19 on market development

PAS were prepared by EnDev country projects. Country projects were also asked to undertake and update their *Energy Access Market Development* (EAMD) scorecards taking into account implications of COVID-19 on market development. Results were used to back market and sector assessments

[1] Projects for which phase-out had already been confirmed were excluded from the review, even if their operations are still running, i.e. Indonesia (phase-out in 06/2021) and Vietnam (phase-out in 12/2020).

conducted by EnDev country projects. Quantitative information on country background and projects' performance, relevance, effectiveness, efficiency displayed in graphs are based on official global sources and EnDev's monitoring data.

PAS were reviewed by an external evaluator and complemented by interviews with country backstoppers and project managers to provide an independent and balanced assessment. All PAS including EAMD scorecards can be found in the annex.

In line with the portfolio review 2018, projects were divided into the following categories

- Countries with a **long-term EnDev involvement** allowing for planning security (up to four years)
- Countries with a **medium-term EnDev involvement** allowing for flexibility in the portfolio (up to three years)
- Countries with an **ending EnDev involvement** allowing structured phasing out (up to one year)

EnDev management further consolidated the evaluator's input by adding a strategic perspective in order to develop a balanced portfolio representation of countries, technologies, and target groups. The following table shows the proposed country categorisation as result of the portfolio review.

Table 1-1
Portfolio review 2020 and proposed country categorization

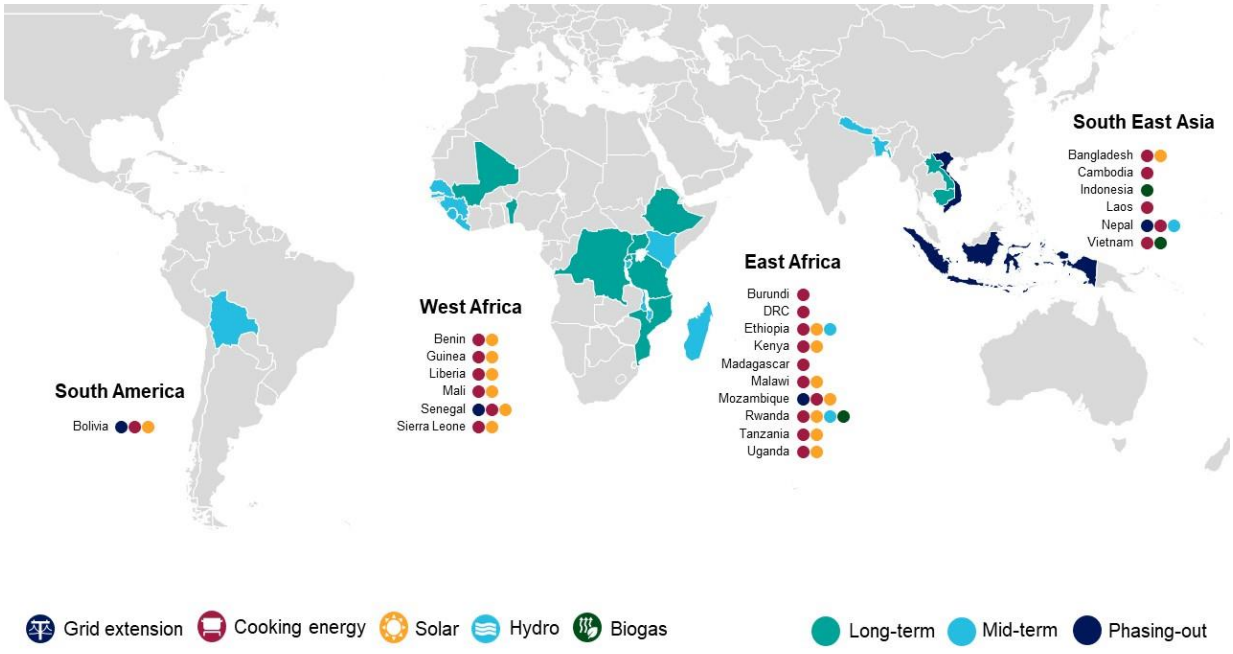
Sub-Sahara Africa	Asia	Latin America
Long-term involvement		
• Benin • Democratic Republic of the Congo • Ethiopia • Mali • Mozambique • Rwanda • Tanzania • Uganda	• Cambodia (with Laos)	
Medium-term involvement		
• Burundi[2] • Kenya • Liberia (with Sierra Leone & Guinea) • Madagascar • Malawi • Senegal	• Bangladesh • Nepal	• Bolivia
Phasing-out		
–		

[2] Conditional to final approval.

Compared to the results in 2018, the portfolio review 2020 does not propose fundamental adjustments. Two projects changed their categorization from medium to long-term involvement (Cambodia (with Laos) and Mozambique), and three projects from long to medium-term involvement (Burundi, Kenya and Senegal). With 18 projects remaining for long and medium-term interventions, EnDev will be active in 21 countries (due to two remaining multi-country projects). The resulting portfolio would show small changes with regard to the following aspects:

- **Geographical coverage:** With 16 African countries in the portfolio, EnDev will maintain its focus on sub-Saharan Africa of which eight are proposed for long-term involvement. EnDev's presence in Asia will be focusing on two long-term countries and two medium-term countries while one medium-term country remains in Latin America.
- **LDC focus:** EnDev will maintain its focus on economically weak countries with 19 countries being defined as least developed countries.
- **Technology:** The scope of technologies supported by EnDev will be sustained. In the field of thermal energy, EnDev will support 18 ICS components and one biogas component. In the field of electrification, EnDev will support 13 picoPV/SHS components, seven mini-grid components, and five projects with a grid densification/extension component.
- **Implementers:** EnDev would largely maintain its current implementers mix and continue its cooperation with SNV, Practical Action, ADES, AVSI, and NIS. Due to the previously approved phasing out of Indonesia as well as with the ending RBF Facility, cooperation with CLASP and Hivos on project level will be terminated for the time being. This might change as part of the upcoming programming cycle.

Figure 1-1
Geographic distribution of the proposed country categorization



1.2 Indications for future programming

As part of the portfolio review, each project is presented with a brief analytical executive snapshot according to its categorization. This also includes an indication on future programming. Detailed country information can be found in the PAS (see Annex).
EnDev continues to gradually phase out the RBF Facility by December 2020.

These projects were thus not assessed in the portfolio review. At the same time, RBF approaches – although governed by their own logic, rules, and procedures – are being mainstreamed and have been considered as part of a country's intervention mix in the portfolio review.

Table 1-2
Proposed categorization of country projects and further info

Country project	Further info
Long-term involvement	
Benin	**Benin** as a rather small sub-Saharan LDC has a very low overall access rates to clean cooking (< 5 %) and a low access rate to electricity (18 %) in rural areas. Recently established national strategies and new institutions as well as EnDev investments in ICS models and in professionalisation of both stove and solar companies provide potential for growth. National institutions and smaller companies are still relatively weak and other development partners focus more on larger companies and peri-urban areas. The project is well positioned to realize this scaling potential, however new partnerships and co-financing is needed. Long-term involvement is conditional to (i) medium-term realization of scaling potential expected from recent investments in professionalisation of companies, (ii) focus on interventions in the electricity sector with high efficiency, and (iii) proven potential of the new productive use of energy (PU) access component. Future programming will follow up on these topics and assess the potential for cooperation with neighbouring countries to provide for larger markets.
Cambodia (with Laos)	EnDev's engagement in both Mekong countries focuses on the clean cooking sector. However, Cambodia and Laos show significant differences in terms of access rates. **Cambodia** has a comparatively high electrification rate and (at least in the urban context) good access to clean cooking technologies. EnDev's focus in Cambodia is on the development of a higher tier clean cooking market (including electriccooking) and succeeded in attracting international stove manufacturers to the Cambodian market. In **Laos**, a very low access rate to clean cooking in rural areas provides the basis for dynamic market development of lower tier stoves with a high potential for further expansion. Both countries show potential hat justify long-term involvement. Long-term involvement in Cambodia is conditional to (i) the viability of a dynamic higher tier market including improved access of stove companies to realize necessary investments, and (ii) successful completion of work on lower tier ICS

	among a largely unserved rural population. Future programming of Cambodia will highlight these elements and provide relevant proof. Future programming in Laos will put a focus on strengthening advocacy for an enabling environment on policy level and on improving quality in the ICS sector through work on labelling, testing, and standards.
Ethiopia	**Ethiopia** as an SDG 7 / SEforAll high impact country with Africa's second largest, fast growing population aims to provide 60 million people with electricity access and 80 million with improved cooking energy in the coming years. Electricity demand grows by approximately 30 % annually. Energy access markets are still in an early stage and need long-term engagement. EnDev plays an important role in developing sustainable ecosystems and viable companies capable to efficiently serve markets. Business models based on PAYGo schemes have not yet been broadly introduced and promise considerable impact. Such approaches could be complemented by RBF as well as combined with interventions for productive use of energy. Future programming will consider the volatile political situation and economic fragility as general risks to be taken into account. A possible impact of the *Grand Ethiopian Renaissance Dam* with its 6,000 MW capacity on the future intervention strategy of EnDev will be factored in. A stronger focus will be laid on commercially viable business models and long-term sustainability of state-driven interventions like electrifying social institutions or solar mini-grids.
Mali	**Mali** as one of the poorest land locked sub-Saharan LDCs has a very low overall access rate to clean cooking (< 5 %) and a low access rate to electricity (25 %) in rural areas. The electrification of rural off-grid clinics and the integrated approach in the Baroueli region with mini-grids and stand-alone solar systems (picoPV, SHS) together with the support to selected villages in the North have proven to be successful. The support to the ICS market as well as interventions for energy access for productive use have started only in 2019 and still need to prove their viability. Scaling up and impact face limitations due to serious political instability (recent military coup) and an overall tense security situation (especially the North of the country). Long-term involvement is therefore conditional to the further development of the political and security situation in the country. While noting that Mali is a challenging implementation environment, future programming will more intensively explore collaboration potentials with other development partners for scaling up.
Mozambique	**Mozambique** as an SDG 7 / SEforAll high impact country has a very low overall access rate to clean cooking (< 5 %) and a very low access rate to electricity (8 %) in rural areas. EnDev has laid the ground for market development with a special focus on targeting poor households in rural and peri-urban areas, functioning as a model for other programs to collaborate and scale up. With the first locally anchored decentralized renewable energy fund, Mozambique has established its own local fund mechanism with the support of EnDev and has successfully applied RBF schemes across different contexts. While the basket fund needs further institutional support during coming years to sustain its growth path as well as to serve as a continental example, it is already contributing to

	channelling support ranging from general market development to humanitarian windows including an innovative COVID-19-rleated RBF intervention. EnDev has laid the basis for future dynamic growth in both the ICS market and in the electricity access market. Being a country especially poor and exposed to a range of crisis, exploring potentials and developing markets needs a long-term perspective. Future programming will include advocacy for the established basket fund and will support market development through streamlining support towards scalable business models and companies.
Rwanda (with Burundi and DRC)	Both sub-Saharan LDCs have very low clean cooking access and low access to electricity rates. Unlike **DRC**, which figures among the larger African countries and ranges among the SDG 7/ SEforAll high impact countries, **Rwanda** is a landlocked country with a relatively small population. EnDev is now tapping into the largely undeveloped clean cooking market with co-financing of the EU. The now well-established enabling environment for the electricity sector in Rwanda creates opportunities including higher tier solutions for productive use and energy access for SI, mini-grids, and grid densification. Long-term involvement is conditional to (i) evidence that ICS markets in both countries develop dynamically, (ii) the electricity sector in Rwanda shows the expected dynamic development based on the National Electrification Plan. Future programming has to put a clearer focus on key activities with highest impact and scaling opportunities in order to avoid dispersion of efforts; also, the project will look for opportunities to develop larger ICS and off-grid markets. Activities in DRC so far were part of a multi-country approach via Rwanda. However, the assessment does neither show the potential for a regional approach with conceptual links or synergies nor efficiency gains among the country components. It is therefore suggested to unbundle the multi-country project currently operating in three countries, resulting in three stand-alone EnDev country projects in Rwanda and DRC respectively, while for Burundi a mid-term involvement is proposed conditional to final approval by EnDev's Governing Board (see Burundi below).
Tanzania	**Tanzania** as an SDG 7 / SEforAll high impact country with a relatively large population (58 million) has still very limited access rates for clean cooking (< 5 %) and electricity rural areas (19 %). Developing a supportive enabling environment for the cooking sector and reaching out to large rural off-grid areas by solar companies and last-mile distribution and services needs a longer perspective. Energy access for productive use started only fairly recently and will be accompanied by an innovative quality assessment approach. EnDev is a trusted partner of government institutions, however, there are risks associated with national policies and their impact on EnDev's market-driven approach. Long-term involvement is conditional to (i) close monitoring of national policies and their impact on private companies and markets, (ii) evidence that recent investments in ICS company professionalisation pays off in terms of dynamic market development, and (iii) promising development of activities for energy

	access for productive use. Future programming will highlight these elements.
Uganda	As a land locked sub-Saharan LDC and SDG 7 / SEforAll high impact country, **Uganda** has only very low access to clean cooking (< 5 %) and low to medium access to electricity rates in rural areas (38 %). EnDev successfully supported the development of mostly lower tier ICS and solar off-grid markets for households, making extensive use of RBF in the PAYGo sector. While in the clean cooking sector EnDev achieved good results, rural electrification is lagging behind and needs special attention in future programming. Short-term market potential for the present lower tier approach still lays in more remote, rural areas and in refugee communities. EnDev is about to promote scalable productive use approaches for local business development through an innovative structure to competence cluster. Future programming will include measures to achieve sustainable long-term market development, amongst others through developing higher tier products and services with combined support to setting up and enforcing standards.
Mid-term involvement	
Bangladesh	**EnDev**'s support has led to successful development of local ICS support structures and off-grid solutions. With rapid grid expansion, EnDev is at a turning point: The envisaged promotion of higher tier cooking solutions (ICS, electric cooking) and innovative productive use approaches (electric mobility) as well as related technological approaches (e.g. SHS micro-grids) show potential. Together with local partners, these potentials have to be further explored and tested with regard to their market and scaling potential. Future programming will outline how to further develop these potentials and how to position EnDev within national ICS and electrification strategies for the country's 2030 target achievement.
Bolivia	**Bolivia** has already high electricity (96 %) and clean cooking access (84 %) rates. The country is a key contributor to EnDev's global productive use results. EnDev represents best practice for a successful transition from basic electricity access to higher tier solutions that contribute to sustainable economic development and job creation. Exemplary is also the independent local basket fund for decentralized renewable energy through which long-term sustainability of EnDev's competitive, market-oriented approach is secured. There is a high potential for sharing such experience across the portfolio as other EnDev countries also are moving towards this transition. In addition, support to last mile electricity access in remote regions is still needed. Future programming will explore opportunities to strengthening its cooperation with government institutions in this largely state-dominated country (e.g. the Ministry for the Productive Development) and to increase outreach to remote areas.
Burundi	Activities in **Burundi** so far were part of a multi-country approach via Rwanda, aiming to improve access to and sustained use of improved cooking solutions in both urban and rural communities. However, the assessment does neither show the potential for a regional approach with conceptual links or synergies nor efficiency gains among the country components. While the country poses very challenging conditions with

	regard to good governance which cannot easily be mitigated at implementation level, the need for stepping up support to progress on SDG 7 remains. It is therefore suggested to unbundle the multi-country project currently operating in three countries, resulting in three stand-alone EnDev country projects (see Rwanda and DRC above), while Burundi is proposed for a mid-term involvement conditional to final approval by EnDev's Governing Board. Future programming will explore alternative implementing structures and closely monitor and assess safeguards in place.
Kenya	**Kenya** is an SDG 7 / SEforAll high impact country and is a key contributor to EnDev's global household access results. Being a relatively large (51 million inhabitants) middle income country with a dynamic market economy it is also a hub for the Eastern African region for new market-driven approaches in the ICS and electricity sector. While access to clean cooking in rural areas is still low (< 5 %), rapid grid extension and off-grid solutions have led to a relatively good overall access to electricity, even in rural areas (72 %). The EnDev/GCF project provides a unique opportunity for a dynamic transition of the ICS market. With emerging new actors working in previous intervention areas (e.g. the World Bank supported *Kenya Off Grid Solar Programme Programme*) EnDev is at a certain turning point. Against this backdrop, EnDev needs to adapt its previous approach with a stronger focus on the still challenging opportunities for energy access for productive use and ICS for social institutions, both with respective potentials for higher impact. EnDev's positioning in the sector should also be used to leverage a stronger focus on the enabling environment, e.g. on stove standardization and testing or fuel standards. Future programming will need to streamline its approach to fit these new intervention areas.
Liberia (with Sierra Leone and Guinea)	**All three countries** belong to the poorest Sub-Saharan countries with very low access to clean cooking (< 5 %) and low to medium access to electricity (26 % - 44 %). Severe environmental problems are caused by deforestation, a large part of which is caused by the use of inefficient cookstoves. EnDev successfully promotes ICS on a political level in the region. In developing the solar off-grid sector, EnDev plays an important role by providing practical, on-the-ground expertise for installations and maintenance (especially in the area of social institutions like health centres). The project has also developed an innovative information and communication technology system which supports technical work and maintenance assistance effectively. Medium-term involvement is conditional to (i) an accelerated (regional) ICS market development, (ii) a more focused approach in the solar off-grid sector, and (iii) collaboration potentials with other development partners for scaling up. Future programming will focus more on lower tier ICS and solar off-grid solutions affordable for larger parts of the population and will further explore regional synergies through its integrated multi-country approach.
Madagascar	**Madagascar** is an SDG 7 / SEforAll high impact country with less than 5% of population with access to efficient cooking and high population growth with severe implications for deforestation. EnDev was successful in setting

	up a market for ICS by strengthening production capacities and marketing channels including innovative financing schemes (work in forest protection projects for a stove). However, a more competitive market-based approach with a larger diversity of ICS producers has not been realized so far and needs to be pushed. In addition, complementary carbon finance until now has a strong influence on ICS pricing thereby jeopardizing the sustainability of the approach if carbon finance might phase out at a later stage. Medium-term involvement is conditional to the development of an ICS market with a range of (specialized) producers and an overall strategy less dependent on third party funding such as carbon finance. Future programming will need to consider these aspects.
Malawi	**Malawi** is a land locked, very poor sub-Saharan country with very low access to clean cooking and electricity in rural areas (< 5 % and 10 %, respectively). ICS market development is still highly dependent on ODA and carbon finance and is not yet mature enough to meet the ambitious national targets. Playing a key role in Malawi in achieving national clean cooking targets and in professionalizing solar companies, EnDev is putting more emphasis on scalable approaches for productive use and for improved access for social institutions, e.g. via an incubator to identify and promote viable productive use approaches. Replication and, equally important, integration of current energy access interventions and pilots at (sub-)district level is needed to reach scale. Future programming will explore which interventions have highest synergy potential and will streamline EnDev's overall approach more thoroughly to counter fragmentation.
Nepal	After years of successful interventions especially in assuring electricity access in remote off-grid regions through micro-hydro plants, **EnDev** is now at a turning point. EnDev needs to adapt its approach while at the same time ensuring the sustainability of previous activities. With already high electrification rates (more than 90 %) and planned further extension of the grid, scaling in the off-grid electricity sector is mostly limited to very isolated areas. Support to render micro-hydro power installations more sustainably including grid connectivity is a key topic for coming years and has potential for additional energy access for productive use. Support for higher tier clean cooking technologies with a particular focus on electric cooking is of growing interest and EnDev can play a key role, but the potential is yet not fully known. Future programming will demonstrate the potential for hydro-grid connection, energy access for productive use and higher tier cooking including electric cooking.
Senegal	Despite favourable economic development (before COVID-19 hit), the **West African country** has still a very low access rate for clean cooking (< 5%). The EnDev/GCF project provides a unique opportunity for a dynamic transition of the ICS market. Against this backdrop, EnDev needs to adapt its previous approach with a stronger focus on the still challenging mini-grid sector, the promotion of PAYGo for stand-alone solar solutions (picoPV, SHS), and for higher tier energy access for productive use. Future programming will outline how to further develop these markets and potentials.

1.3 Energising the Green Economic Recovery: Protecting Lives and Opportunites

The COVID-19 outbreak poses danger of eroding and undoing years of gains made towards SDG 7 in reaching universal energy access and setting countries back in their development tracks.

The effects of COVID-19 are heavily felt by energy companies. After the first wave of the pandemic hit and countries worldwide went into lockdown, energy companies were severely hit by interrupted international and regional supply chains as well as by restrictions in serving their local markets. While many of those companies that managed to survive this crisis and are now struggling to economically get their feet back on the ground, the second wave of the pandemic is again leading to partial lockdown in country after country. Even though the adapted lockdown approach aims to sustain economic operations as broadly as possible, local energy companies are increasingly under financial distress. The energy access industry barometer, a survey conducted by EnDev in a strategic cooperation with different stakeholders that collected feedback from more than 600 local energy companies revealed that 85% of the companies will not survive more than five months under the previous lockdown conditions. 35% of companies already laid off 30% of their staff during the first wave of the pandemic with plans to lay off additional staff in the next months if no support is available. The survey also showed that companies were cornered between negative effects on sales and after sales services (demand side) as well as limited access to finance (supply side).

Companies in the decentralized renewable energy markets indicated an urgent need for dedicated technical and operational support but most prominently raise the need for financial relief, either as grants or bridging loans. Financial needs to ensure local energy companies' survival are generally below 50,000 EUR. With almost all existing COVID-19 relief funds in the energy access sector however out of reach for local smaller and medium-sized companies, the need to protect local decentralized renewable energy markets allowing local energy companies to continue operations previously remained largely unanswered.

To prevent energy access market deterioration and further economic downturn, EnDev can draw on an extensive menu of interventions targeting both the technical needs of the energy companies as well as their financial barriers. With its market-based approach, EnDev is able to ensure that interventions on supply and demand side will enable the ecosystem of energy companies to play a crucial role in bringing green recovery to scale. EnDev established a phased approach in which immediate relief interventions to bridge the liquidity constraints of local energy companies are combined with more medium-term support interventions to allow for a post-COVID-19 recovery of local energy companies to strengthen the market and build companies' resilience.

While needs are extensive across EnDev's portfolio, EnDev is fast-tracking a geographically **focused scenario on sub-Saharan Africa** for which additional funding of ten million EUR were secured. The scenario focuses on five energy access markets in need of support in line with SEforAll's high-impact countries:

- Ethiopia
- Mozambique
- Senegal
- Tanzania
- Uganda

Selection criteria are, amongst others:

- **Progress at risk:** risk of falling behind in achieving SDG7, particularly in comparison to pre-COVID-19 progress towards SDG7 and energy access market growth
- **Business resilience:** type and number of local companies able to rebuild (large parts of) the respective energy access market
- **Relevance:** contribution of the country to EnDev's global access targets

Ethiopia

In the absence of suitable relief mechanisms for smaller enterprises that represent the bulk of Ethiopia's energy access sector, EnDev is providing targeted action that ensures the protection of key market structures. Interventions focus on supporting a critical mass of selected enterprises that are system-relevant for post-crisis green economic recovery and building back better. In parallel, EnDev launches a pro-poor smart subsidy scheme that provides vulnerable households with discount vouchers for the purchase of a cookstove or solar PV system, thereby creating demand for enterprises to address. To avoid market distortion effects, subsidies are strictly time-limited, for selected vulnerable communities only, and serve as a one-off promotion activity to steer enterprises towards new, more remote markets.

Complementarily to demand and supply side support, EnDev provides technical support to cookstove and solar PV associations (both central and regional) to form strong steering and communication/resource platforms in order to provide industry voice and sector coordination during the pandemic. The associations will also be given an active role in all above-mentioned supply-/ demand-side measures.

Mozambique

A relief scheme for companies vulnerable to increased payment default rates of clients has been established to ensure continuity of access to electricity for households and preventing bankruptcy of PAYGo solar companies. Companies offer price promotions to reduce clients' electricity expenses during the crisis. Households that already had energy access before the pandemic are thus more likely to maintain their access. As households have a reduced ability to pay during the pandemic, an incentive is passed on to prospective clients by means of price reductions.

In addition, EnDev fosters income generating and productive use of energy, e.g. by the provision of equipment and training for local manufacturing of face masks powered by solar energy. Both approaches – on supply as well as on demand side – offer a combination of results-based financing and traditional technical assistance to overcome liquidity bottlenecks.

Senegal

EnDev, as a major actor in the Senegalese energy access sector, is focusing its extra support to relevant companies of the ICS and energy sector to stop further

deterioration of their business and infrastructure and investing into better corporate resilience. EnDev focuses on increasing the liquidity of stakeholders of the ICS sector along the entire production chain through a mix of input-provision and bulk orders of ICS. Complementary, EnDev supports awareness raising via TV and radio campaigns on health-related benefits. Demand is further stimulated by special short-term promotional offers and the improvement and revitalization of consumer financing concepts. Mini-grid operators are supported to provide pro-active maintenance of the systems. In addition to an extension of the governmental electricity subsidy to clients, turnover for the private sector will be generated through a pre-paid mobile money approach combined with smart meters.

In parallel, EnDev advises the Senegalese Agency for Rural Electrification in developing and (potentially) applying a governmental subsidy scheme to mini-grid clients.

Tanzania

EnDev is establishing a dedicated off-grid solar green recovery fund based on a result-based financing scheme. The fund provides post-sales incentives to firms that will be valued according to a vulnerability index which takes COVID-19 implications into account. EnDev provides support in three areas: consumer finance grace period extensions, employee retention relief, and inventory recovery. Combined, these elements will work to support a re-stock, retain and re-start strategy needed to support sustained demand side access to quality solar services.

In addition, EnDev supports advocacy work of industry associations such as the Tanzania Renewable Energy Association focusing on clarity from the Government of Tanzania on how off-grid renewables fit into the national universal electrification plan and creating a platform for the private sector to voice their challenges in light of COVID-19.

Uganda

EnDev works with selected high potential cookstove and solar PV enterprises with operations throughout Uganda as well as up to energy hubs in refugee settlements, providing bridging grants in return for achieving conditional targets. This is complemented by an RBF-like approach allowing PAYGo solar companies to offer special subsidized price promotions that reduce customers' expenses. Additionally, EnDev works with local partners to provide cookstoves and solar PV systems through specific promotions to vulnerable households, including refugees and host communities. Activities focus on current needs, for example electricity for remote learning.

With the aim to strengthen the sector during and after the pandemic, EnDev provides technical assistance to cookstove and solar PV associations to strengthen advocacy for effective government policy and regulation.

An (em)powered health centre

Health centres in Ethiopia are using solar energy to improve their service

More than 16,000 people live in Korjo village, 370 kilometres from Addis Ababa. Korjo is not connected to the national grid. At the local health centre, it was challenging treating accidents at night under the weak light of mobile phones or even torchlights. The centre had a single refrigerator, which ran on kerosene, to cool medication and laboratory chemicals. This required about 20 euro per month for fuel – a significant amount for the limited budget of a rural health centre. This changed in 2018, when EnDev installed a solar system here in collaboration with a local solar company. The clinic's team can now treat patients safely at night and births no longer take place in the dark. The laboratory has an electric microscope and electric equipment to analyse blood samples. Laboratory technician Anteneh Tsadik is grateful for the improvements: "It is now easier for me to detect illnesses such as tuberculosis and malaria." And patients also notice the difference – patient numbers have grown by one third. Now, over 700 people come to the health centre every month, especially mothers and children.

2. Overview of planned country activities in 2021

This chapter provides information on current projects, durations, and budgets. The proposed changes for individual projects are listed in the column labelled “new”. The project period for all projects[3] is suggested to be extended until 12/2021. Together with suggested transitional budget adjustments, this is intended to bridge the time towards the submission of the proposals as a result of the upcoming programming cycle and the subsequent Governing Board decision in the context of the 24th Governing Board Meeting tentatively scheduled for May 2021. The rationale behind these changes is to enable EnDev country projects to transition administratively while ensuring continuous implementation until additional funding will be allocated.

It is expected that not all EnDev country projects will be utilizing their previously approved budgets (e.g. due to delayed operations caused by COVID-19). This means that a certain share of already committed funds will again become available for re-allocation. Based on 2020 annual expenditures at country level, EnDev will perform a portfolio-wide assessment of such re-allocatable funds at the beginning of 2021. Potential budgetary changes at country level will be integrated in revised country budgets as part of the *Annual Planning 2021 Update*.

Ongoing projects are shown in Table 2-1, Table 2-2 provides an overview of projects phasing out. Management and thematic activities are presented in Table 2-3. Additional activities that are fully integrated and implemented in the context of the EnDev partnership are presented in Table 2-4.

[3] Projects for which phase-out had already been confirmed were excluded, even if their operations are still running, i.e. Indonesia (phase-out in 03/2021) and Vietnam (phase-out in 12/2020).

Table 2-1
Ongoing country and regional projects

Country	Lead political partner	Project duration			Funding (in EUR 1,000)		Planned outcomes on HH level in persons[4]
		start	end old	end new	old	new	
Bangladesh	Bangladesh Ministry of Power, Energy and Mineral Resources	06/09	06/21	**12/21**	25,975	**26,350**	3,433,500
Benin	Ministère de l'Energie	10/09	06/21	**12/21**	19,599	**20,374**	1,065,000
Bolivia	Vice-Ministry of Electricity and Alternative Energy (VMEEA) of the Ministry of Energy	10/09	06/21	**12/21**	17,584	**18,084**	591,000
Burundi[5]	suspended; focus on local private sector			**12/21**		**250**	48,000[6]
Cambodia (with Laos)	Cambodia: Ministry of Mines and Energy (MME) Laos: Ministry of Science and Technology (MoST)	03/15	06/21	**12/21**	4,163	**4,813**	103,000
DRC[7]	suspended; focus on local private sector	12/19	06/21	**12/21**		**900**	93,000[6]
Ethiopia	Ministry of Water, Irrigation and Electricity (MoWIE)	01/10	06//21	**12/21**	38,087	**40,837**	2,420,000

4 Indicative target forecasts are not adjusted to the extended project duration as this will be done in the upcoming programming cycle. Furthermore, indicative target forecasts are not in all cases synchronized to the initial end of the phase previously set to be 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 initial phase end, 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 with the extension of the current phase.

5 Burundi: Budget for 2021 only. With *Annual Planning 2021 Update* funds spent 09/2010-12/2020 will be shown in Burundi and deducted from the budget of former regional project Rwanda (with Burundi and DRC).

6 Burundi, DRC and Rwanda were part of a multi-country approach via Rwanda jointly contributing to the indicative target of 753,000 people reached. The indicative target presented in this document shows a breakdown of target per country as of the Annual Planning 2019 Update. The indicative target will be adopted in the course of the upcoming programming cycle.

7 DRC: funds budgeted for DRC since 12/2019 (implementation by AVSI foundation).

Country	Lead political partner	Project duration			Funding (in EUR 1,000)		Planned outcomes on HH level in persons[4]
		start	end old	end new	old	new	
Kenya	Ministry of Energy	04/09	06/21	**12/21**	26,230	**26,730**	4,895,000
Liberia (with Guinea and Sierra Leona)	Liberia: Ministry of Mines and Energy; Sierra Leone: Ministry of Energy	05/12	06/21	**12/21**	7,720	**8,220**	85,700
Madagascar	Secrétaire Général de la Région Atsimo Andrefana	12/12	06/21	**12/21**	1,289	**1,414**	145,000
Malawi	Ministry of Natural Resources, Energy and Mining / Ministry of Gender, Children, Disability and Social Welfare (for RBF)	12/12	06/21	**12/21**	7,951	**9,041**	1,513,000
Mali	Ministry of Water and Energy	04/09	06/21	**12/21**	10,057	**10,682**	168,800
Mozambique	Ministry of Mineral Resources and Energy	10/09	06/21	**12/21**	27,509	**30,134**	tbd[8]
Nepal	Ministry of Energy, Water Resources and Irrigation	05/09	06/21	**12/21**	9,854	**10,354**	505,000
Rwanda[9]	Rwanda Energy Group (REG) – Energy Development Company Limited (EDCL) / Ministry of Infrastructure;	10/09	06/21	**12/21**	25,061	**24,786**	612,000[6]
Senegal	Ministry of Petroleum and Energy	04/09	06/21	**12/21**	21,298	**23,798**	1,800,000
Tanzania	Ministry of Energy	12/12	06/21	**12/21**	12,200	**14,575**	1,485,000
Uganda	Ministry of Energy and Mineral Development (MEMD)	04/09	06/21	**12/21**	14,043	**15,943**	915,000

8 After the cyclone Idai hit Mozambique, the project's approach and geographic scope were adjusted to the new situation. The project's adapted approach will be reflected in the upcoming programming cycle, including adjusted targets.

9 Rwanda: including funds for Burundi until 12/2020 which will be calculated and deducted in *Annual Planning 2021 Update*. Funds for DRC which is implemented by AVSI are deducted already from the budget of the former regional project Rwanda (with Burundi and DRC) which leads to a reduction of the total budget at this point although Rwanda is proposed to receive an upscaling of 625,000 EUR for the period of 07-12/2021.

Table 2-2
Ending projects

Country	Lead political partner	Project duration			Funding (in EUR 1,000)	Planned outcomes on HH level in persons
		start	end old	end new		
Indonesia	Ministry of Energy and Mineral Resources (MEMR)	12/12	06/21	-	3,431	51,000
Vietnam	Ministry of Agriculture and Rural Development (MARD)	07/13	12/20	-	4,432	107,700
RBF BD, KE, RW, TZ, UG	BD: Ministry of Power, Energy and Mineral Resources (MoPEMR); KE: Ministry of Energy and Petroleum; Renewable Energy Directorate; RW: Ministry of Infrastructure (MININFRA) TZ: President's Office of Regional and Local Government (PO-RALG); UG: Ministry of Energy and Mineral Development (MEMD)	03/15	11/20	-	6,580	
RBF MZ, RW, UG	UG: Ministry of Energy and Mineral Development (MEMD) MOMZ: Ministry of Mineral Resources and Energy; RW: Ministry of Finance and Economic Planning (MINECOFIN)	03/15	02/20	-	3,283	165,000
RBF KE, TZ, UG	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	03/20	-	1,835	24,500

Table 2-3
Management and thematic activities

Country / Region		Project duration			Funding (in EUR 1,000)	
		start	end old	end new	old	new
Head office	Programme mgmt., incl. DFAT prep.	01/09	06/21	**12/21**	28,426	**29,776**
Head office	Conceptual developing and piloting (DEZA, USAID)	08/18	12/20	**12/21**	1,494	**2,422**[10]
RBF preparation		08/12	12/20	-	956	
RBF evaluation		08/12	12/20	-	1,051	
Innovation Fund	Bangladesh, Madagascar, Mali, Mozambique	11/18	11/20	**06/21**	1,250	

[10] Including: 880,000 EUR / 1,000,000 CHF (SDC for SIINC), 636,000 EUR / 750,000 USD (USAID for RBF Facility), and 906,000 EUR / 1,000,000 USD (USAID for SCCIF).

Table 2-4
Additional thematic activities outside EnDev (GIZ)

	Country / Region	Project duration		Funding (in EUR 1,000)
		start	end	
Climate-friendly cooking	Kenya (GCF)	01/20	12/24	14,110
	Senegal (GCF)	01/20	12/24	13,203
	Global (GCF)	01/20	12/24	1,996

3. Abbreviations

ADES	Association pour le Développement de l'Energie Solaire, Switzerland
AEPC	Alternative Energy Promotion Centre, Nepal
AVSI	Association of Volunteers in International Services
BBF	Bangladesh Bondhu Foundation
BCC	Behavioural Change and Communication
BDS	business development support
BMZ	German Federal Ministry of Economic Cooperation and Development
CLASP	Collaborative Labelling and Appliance Standard Program
DFAT / AUSAid	Australian Department of Foreign Affairs and Trade
DGIS	Netherlands Ministry of Foreign Affairs and Tra
DRC	Democratic Republic of the Congo
EAMD	Energy Access Market Development
ECCA	Ethiopian Clean Cooking Alliance
ECOWAS	Economic Community of West African States
ECREE	ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
EnDev	Energising Development programme
EPC	electric pressure cooker
ESDS	Energy Solutions for Displacement Settings
FCDO	UK Foreign, Commonwealth & Development Office
GCF	Green Climate Fund
GHG	greenhouse gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GOGLA	Global Off-Grid Lighting Association
GBE	Grüne Bürgerenergie – Green People‘s Energy Programme (BMZ)
HDI	Human Development Index
HH	households
HIVOS	Humanistisch Instituut voor Ontwikkelingssamenwerking
ICS	Improved Cookstoves
ISO	International Organization for Standardization
ITAC	Independent Technical Advisory Commitee
KOFIH	Korea Foundation for International Healthcare
KPI	key performance indicator
LDC	least developed countries
LNOB	Leave no one behind

LPG	liquefied petroleum gas
MCA	Millennium Challenge Account
MECS	Modern Energy Cooking Services Programme (FCDO)
MHP	micro hydropower
MW	mega watt
NAP	National Action Plan
NCF	Nordic Climate Fund
NDC	Nationally Determined Contributions
NEA	Nepal Electricity Authority
NGO	Non-governmental organisation
NIS	Nordic International Support Foundation
OECD DAC	Organisation for Economic Cooperation and Development - Development Assistance Committee
PAYGO	Pay-As-You-Go
picoPV	pico photo voltaic
PU	productive use of energy
QA	Quality Assessment
RBF	results-based financing
RE	renewable energy
RVO	Rijksdienst voor Ondernemend Nederland
SDC / DEZA	Swiss Agency for Development and Cooperation
SDG	sustainable development goals
SHS	solar home systems
SI	social institutions
SME	small and medium enterprise
SNV	Stichting Nederlandse Vrijwilligers / Netherlands Development Organisation
SREP	Scaling up Renewable Energy Program
TVET	Technical Vocational Educational and Training
USAID	United States Agency for International Development
USEA	Uganda Solar Energy Association

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Energising Development
Annual Planning 2021
Annex

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 Swiss Agency for Development and Cooperation
The UK Foreign, Commonwealth & Development Office

With co-financing from the **Australian Department of Foreign Affairs and Trade**, **the European Union**, **Icelandic International Development Agency, Irish Aid, Korea Foundation for International Healthcare, Swedish International Development Cooperation Agency,** and the **United States Agency for International Development**

Coordinated and implemented by

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Rijksdienst voor Ondernemend Nederland (RVO)

Association pour le Développement de l'Energie Solaire Suisse (ADES)
Association of Volunteers in International Service (AVSI)
Collaborative Labeling and Appliance Standard Program (CLASP)
Humanistisch Instituut voor Ontwikkelingssamenwerking (HIVOS)
Nordic International Support Foundation (NIS)
Practical Action
Netherlands Development Organisation (SNV)

Content

1. Portfolio Review: Country Analysis

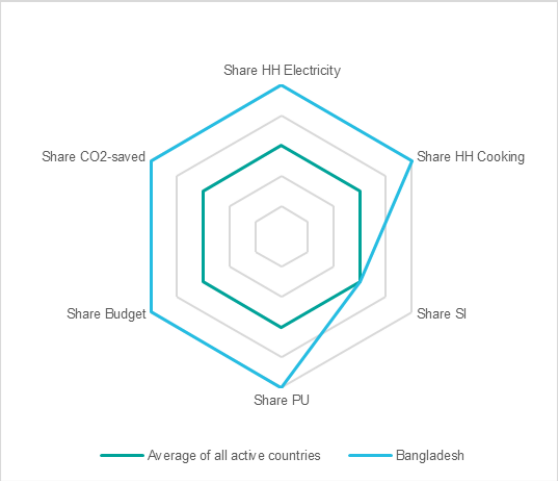
Bangladesh

Section 1: Key facts

Country facts	
Population	161.4 million
HDI	135 ↑ | Total (0.62)
UN Classification	LDC
Access clean cooking	60 % urban 9 % rural
Access electricity	97 % urban 78 % rural

Project facts	
Project Period	06.2009 - 06.2021
Budget	EUR 25,975,000
Core funding incl. RBF	EUR 23,348,140
Earmarked	EUR 2,626,860
Average annual turnover	EUR 2,205,944
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev was instrumental in **introducing ICS to Bangladesh** (2.7 million EnDev stoves since 2009); still 76% or 31 million households rely on traditional stoves. • Draft 2020-2030 **National Action Plan for Clean Cooking** (NAP) calls for complete replacement of traditional cookstoves with clean cooking solutions by 2030 and for e-cooking in 3.5 million households by 2030. • Most successful **SHS programme** globally (more than 6 million systems installed, of which more than 500,000 through EnDev); but with fast expansion of the electric grid (government objective: 95% grid electricity access by 2021) focus today on connecting SHS by peer-to-peer micro-grids.
Contribution to paradigm shift	• Exponential growth in the **tier-2 ICS sector** (500,000 stoves in 2019, over 100,000 per month in early 2020) based on successful leveraging of carbon finance. • EnDev explores **higher-tier ICS markets** (tier-3) and supports total clean cooking solutions using improved biomass fuels (e.g. briquettes). • EnDev has started to promote large scale dissemination of **e-cooking** technologies including field tests and measures to encourage national and international market actors to enter in the national market. • **Productive Use** of electricity (PUE) and larger ICS as a new focus area of EnDEv in Bangladesh (electric mobility, agriculture, SMEs, SI, smart peer-to-peer microgrids) building on improved access to higher-tiers electricity, improved electricity storage and grid integration. • Support to further development of **electric mobility** of small electric passenger and freight vehicles of SMEs as a form of productive use of electricity.
Important collaborations for scaling up	**Funding and investment** • EnDev Bangladesh recently received co-financing from **FCDO** and **RVO**; RVO co-funding is part of a multi-country RVO programme to strengthen ICS multi-stakeholder platforms in different countries; FCDO has expressed interest to additionally support EnDev with an earmarked contribution from a new, 5 years, GBP 200 million Bangladesh Climate and Environment Programme. • Bangladesh is focus country of the **Modern Energy Cooking Services (MECS) programme** supported with GBP 40 million globally. Close coordination already established. • Early stage dialogue with EU on energy access interventions, e.g. through the **ElectriFI initiative** (impact investment facility for early stage private companies, focusing on new/improved electricity connections). • **Bangladesh Bondhu Foundation (BBF)** secured carbon financing (CDM) of up to 90 million USD for ICS; implementation supported with capacity development and policy support / enabling environment work of EnDev.

	Implementation • The **Sustainable and Renewable Energy Development Authority** (SREDA) as efficient national collaboration partner for policy advisory and sector dialogue across whole spectrum of activities. • The EnDev supported **Bangladesh Bondhu Foundation** (BBF) as main partner for ICS promotion achieved organisational and financial independence and has become the country's largest ICS organisation successfully leveraging carbon finance (CDM) for scaling. • Exploration of markets for higher tier stoves in collaboration with Practical Action (PA) and SNV; **SNV** and **PA** have strong interest to increase their energy sector activities in Bangladesh and together with MECS will be important partners for promoting e-cooking. • Collaboration with the parastatal **Infrastructure Development Company Limited** (IDCOL) to scale up ICS and solar programmes. • Cooperation with German-Bangladeshi start-up **SolShare** to test and promote peer-to-peer micro-grids of SHS (smart grids) for higher-tier access and PUE.
	Knowledge sharing and learning • EnDev supported **exchange platforms** (SREDA, Household Energy Platform) contribute efficiently to exchange among all actors (state actors, research, private sector and sector associations, etc.). • EnDev-led **informal circle on e-cooking** including MECS, PA, SNV, research, private companies, organizes online meetings and exchange events • Bangladesh being a focus country of **MECS** has a high potential for further intensification of the learning process. • **EnDev innovation fund** provides space for knowledge sharing and learning on innovative new technologies and approaches (e.g. on smart micro-grids of SolShare).
Gender	• Preparation of **gender analysis** foreseen for 2020, currently postponed due to COVID-19; ambition to develop specific actions and mainstream gender aspects into monitoring and reporting (e.g. gender sensitive indicators). • **Gender analysis and action plan** for Sustainable Energy for Development, and EnDev programmes of GIZ Bangladesh conducted in 2016. • **Gender aspects mainstreamed** into all on-going implementation activities, e.g. development of gender action plan at BBF with focus on female recruitment and training in the "Bondhu Chula Doctors Programme" (ICS maintenance programme with 8.000 workers, thereof > 90% women) leading to significant improvments in livelihoods and social status.

Consideration of ITAC recommendation

Availability of laboratory facilities for ICS testing: Test all ICS types to the new ISO 19867-1:2018 standard has high priority for EnDev in Bangladesh, but despite EnDev's support (concept development for a laboratory in 2018) the national institutions charged with developing laboratory capacities (IDCOL and the Bangladesh Council of Scientific and Industrial Research/BCSIR) made no progress until now in developing an accredited laboratory. A decision was planned for early 2020 to organize alternatively testing in neighbouring countries (e.g. public laboratory RETS in Nepal), but further progress is delayed due to COVID-19.

Coordination of IDCOL and BBF: Supporting dialogue in the household energy sector is an important part of a continued EnDev role. Mandate to conduct dialogue between the two large-scale ICS programmes currently active in Bangladesh lies with SREDA; EnDev provides support through practical inputs (providing neutral space and moderator; testing of ICS to address mutual accusations of sub-standard products etc.). Despite these efforts coordination between the two large household energy programmes remains challenging. Market entry of these WB and Korean carbon finance funded programmes however leads to new opportunities to improve sector coordination through intensified donor dialogue.

Demonstration of viable business cases: Increased focus is laid on demonstrated viable business cases for all implementation activities, including pilot activities on higher-tier fuel chains (with PA and SNV) and on e-cooking (with the United International University/UIU); Development and demonstration of viable business cases includes market studies, analysis on costs and revenues and competing cooking solutions (like LPG) as well as on market-driven scaling up potentials.

Higher tier shift: A shift to higher tiers is realised by supporting activities on new fuels (e.g. briquettes), e-cooking and integration of micro-grids; in the PU access sector EnDev supports PUE approaches especially through higher-tier ICS (commercially used larger cookstoves) and to a lesser degree PUE in agriculture (solar water pumps, threshing machines) and other usages (solar powered fridges for commercial use etc.).

Focus on remote areas: Outside urban areas the socio-economic situation and the market conditions e.g. for cooking solutions is quite homogenuous in most regions of the country. EnDev's electricity access activities focus on higher tiers (peer to peer micro-grids) and productive use in very remote off-grid areas. Working with vulnerable refugee communities has a large potential for ICS and electricity interventions, but access is strictly controlled by Government institutions and currently out of reach for EnDev.

Address enabling environment: EnDev is actively involved in the development of the National Action Plan on Clean Cooking 2020-2030 and plans to support its implementation. Policy advice for the electricity sector is largely covered by other programmes and donors.

Gender strategy and action plan: see point on gender in section above.

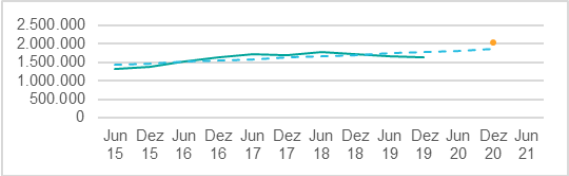
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

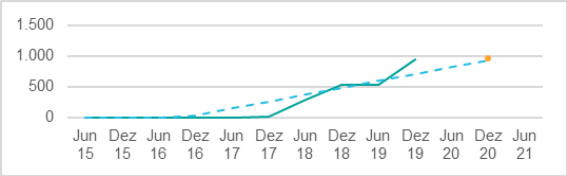
HH Access Cooking

Targets: 2,035,000 Achieved: 1,624,501



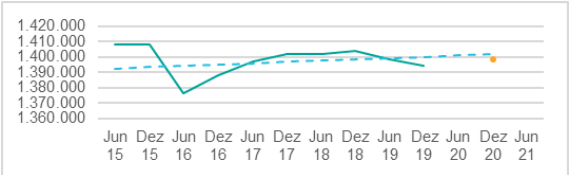
SI Access

Targets: 960 Achieved: 942



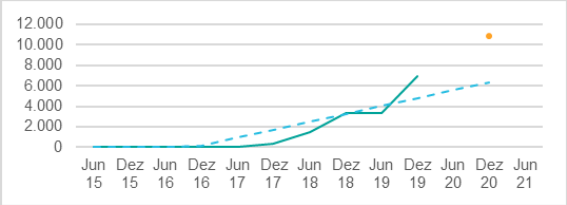
HH Access Electricity

Targets: 1,398,500 Achieved: 1,394,637



PU Access

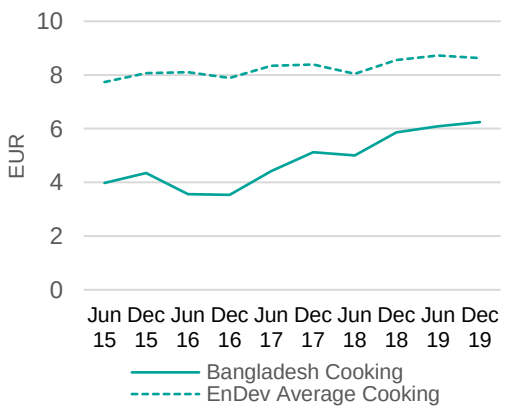
Targets: 10,800 Achieved: 6,935

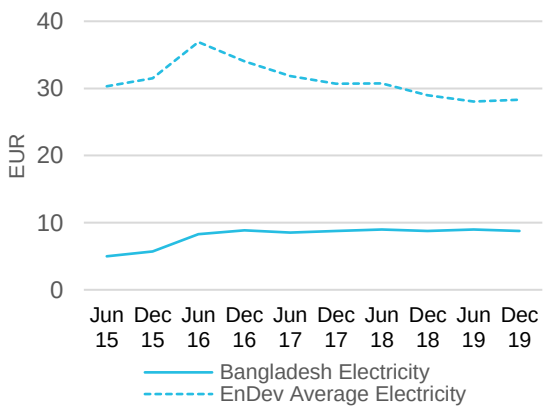


Additional info

- Slight downwards tendency of achieved figures for **cooking and electricity access** due to "dropping out" of the EnDev calculation of significant figures achieved in the 2013 to 2014 period.
- All figures only include outputs until 10/2019; significant **additional numbers achieved** in November and December 2019 (131,000 household stoves, 8,000 commercial stoves) not yet included.
- ICS disseminated by BBF since 01/2019 are **only partially counted** towards EnDev as major part of funding comes from carbon finance.
- **PU access** targets had been considerably increased in 2019 and are expected to be achieved considering achievements realised after 10/2019 not already included in graph above.

Efficiency





Additional info

- Very high cost efficiency in both **cooking and electricity access** compared to EnDev average due to (i) efficient ICS promotion scheme through BBF, PA, SNV in combination with own BBF carbon finance (cooking sector), and (ii) large solar (SHS) market.
- Partial shift to higher tier cookstoves and fuel systems, as well as increase in interventions targeting SI and PU, has led to **slightly higher unit costs**. This trend is expected to continue, reflecting the intended move to higher tier stoves (including e-cooking).
- The same trend to slightly higher costs is also expected for the electricity sector as the SHS/micro-grid activities which started in 2019 with SolShare **require additional financial means** to develop the systems.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

Government policy targets universal access to electricity by 2030. Bangladesh is pursuing an aggressive **grid expansion programme** to provide 100% access by 2021 (~95% grid supply, ~5% through off-grid technologies, especially solar-diesel hybrid mini-grids and SHS). However, electrity access rates have been increasing but reliability is still problematic and access in rural areas is often poor and/or limited to lower tier-levels. Transmission and distribution infrastructure is still weak, quality of electricity access is poor with outages, voltage and frequency fluctuations. **Off-grid solar solutions** are especially important in remote districts where the rate of electrification is the lowest. In electrification, activities have to focus on such "remaining islands" that will not be grid-connected, on smart micro-grids including grid integration leading to higher reliability, and on encouraging innovative, higher tier PU approaches. Undertaking a market assessment for SHS or pico solar products, which have mostly entered the maturity phase, was not seen as relevant. Depending on future market developments and the quality of rapidly rolled out grid connections, supporting SHS might however become relevant again in future (5% off-grid access still equals to more than 2 million households).

Introduction and scaling-up of **PU appliances** are seen as the focus for future interventions in electrification. Market conditions and development, however, vary widely between different types of PU appliances (e.g. fans, fridges, small pumps, different types of agroprocessing equipment, etc.), making separate assessments necessary. Bangladesh experiences bottom-up introduction of **electric mobility**, with already around 3 million electric vehicles on the roads resulting in significant environmental benefits. Especially interesting seems Electric mobility as a major Productive Use of electricity (consuming ~1.5 GW during peak evening charging operation): light 3- and 4-wheeler vehicles with electric motors (of about 200-1200w) used for short-distance (up to 10km) passenger transport across all geographies and districts of Bangladesh. Informal operating procedures lead to problems with charging, grid overloading, short battery life, in turn resulting in poor acceptance by policy makers. Considering high population density and advanced market stage, Bangladesh offers an ideal case for EnDev to pioneer electric mobility (including boats) solutions (decentralised solar powered charging stations, introduction of improved battery technology) as new part of its programmatic approach.

Cooking Sector

The ICS market is dominated by two large dissemination programmes (BBF with carbon funding, and IDCOL with World Bank and GCF funding) each aiming at more than 1 million stoves per year. ICS figures from all other market actors are minimal. The government is strongly promoting LPG, which is spreading fast in urban and peri-urban areas. The **National Action Plan for Clean Cooking** (NAP) foresees a mix of ~55% gas, 35% ICS and 10% electric cooking by 2030. While especially the demand side is quickly moving into the expansion phase (currently held back by the COVID-19 crisis), market diversification is hindered by a lack of supportive measures in the enabling environment, perpetuating the current BBF / IDCOL duopoly – which is, however, effective in delivering rapidly rising numbers. The ICS scorecard's evident positive trend in 2019 was severely disrupted by COVID-19, especially affecting investment, networks, awareness campaigns, courses and other related activities.

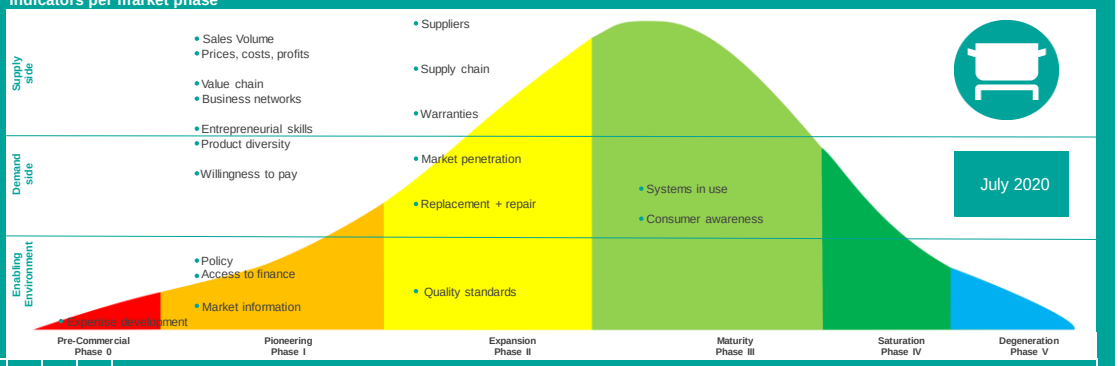
To reflect a potential shift of EnDev activities towards **e-cooking**, considering the significant market potential (NAP targets of 1.5 million households by 2024 and 3.5 million by 2030), an EAMS on the e-cooking market was filled out for the first time for 07/2020. Limited information is available; on-going market surveys and studies will inform on next steps. While the e-cooking market is in an early stage, it seems to approach a "take off point" rapidly. Overall, significant potential remains for EnDev to engage in the clean cooking sector in Bangladesh.

Summary EnDev Market Scorecard: Bangladesh July 2020 Improved cookstoves

Market:

The improved cookstoves (ICS) sector in Bangladesh consists of government agencies, development partners, NGOs, small enterprises and research institutes. For this scorecard, the market is defined as concrete and metal improved cookstoves of different types and designs, with and without chimneys, fuelled by solid biomass (both processed and non-processed), in the whole geographical area of Bangladesh. The market for ICS is dominated by 2 main donor supported programs, BBF supported by EnDev & Korean carbon fund, and IDCOL supported by WB/GCF. In addition, there are a number of private manufacturers. The coordinating body for the sector is HEP project, SREDA, under govt. of Bangladesh.

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	-

Indicators		Variables	2019	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	→	→	↘	Covid-19 has caused a significant decline in installation and sales due to limited field activities. The businesses and NGOs supported by two donor supported programs have seen their sales numbers fall substantially. BBF partners have declined in number. No information available on bankrupcies. Mixed picture of private sector, for some companies cyclone and flooding also means new customers.
	S1V2	Business modalities	↗	→	↘	All types of business and sales activities of implenmenting organizations and entrepreneurs have been reduced due to Covid-19, many adjust by informally divesifying.
	S1V3	Formality	↗	↗	→	The formally registered companies remain unchanged.
	S1V4	Jobs created	→	→	↓	As a result of Covid-19, many businesses and implementers have had to lay off some of their staff.
S2 Sales Volume	S2V1	Products / services sold	↘	→	↓	The number and types of products and services sold have gone down due to less demand and lack of household income.
	S2V2	Inventory turnover	▽	▽	↔	For BBF stoves still quite fast inventory turnover; production also hampered by Covid-19. Other producers only produce batches on demand, rather than continuous production.
S3 Prices, costs and profits	S3V1	Prices	→	→	→	The covid situation did not have a significant impact on the price of the product in the market. Prices for some stove types (portable metallic) have increased, especially in more remote areas due to higher transport cost.
	S3V2	Costs	→	→	↘	Cost per stove production has increased somewhat due to shortage of some raw materials, transport and additional efforts to provide safe working conditions.
	S3V3	Profit margin	→	↗	↔	The Covid-19 situation has led to many stove entrepreneurs with significantly reduced sales and as a result, significantly less profit margin or losses. Highly variable picture across different companies.
	S3V4	Investments	↗	↗	↓	Many entrepreneurs are having to scale down activities due to reduced damand and therefore no further investment is taking place.
S4 Supply chain and after-sales service	S4V1	Length	→	→	→	The businesses and NGOs have their respective areas of activities, ergo no competition among businesses and this remains unchanged from December 2019.
	S4V2	Distribution channels	→	→	↘	The transport of products have stalled due to Covid-19 and current floods.
	S4V3	Spatial reach	→	→	→	Businesses have their own designated areas of operation and Covid-19 has not affected much in this respect.
	S4V4	Initial suppliers	▽	▽	↘	The supply chain for the raw materials for the businesses have been adversely affected due to the Covid-19 situation. But the number of initial providers is not much affected yet.
	S4V5	After-sales service	→	↗	↓	The staff are not able to provide after-sales service due to movement restrictions.
S5 Value chain	S5V1	Value added	→	→	→	Value added at the level of installing a stove has not drastically changed over time; the value added is quite low to keep prices low (in order to sell more stoves). This remains unchanged since December 2019.
S6 Business networks	S6V1	Networks	→	→	→	Business networks severely disrupted to due Covid-19.
	S6V2	Partnerships	▽	▽	↓	Partnerships not affected too much so far, but at risk - therefore trend negative
S7 Warranties	S7V1	Warranties	→	→	→	Small scale businesses offer 1 year warranty. Remains unchanged since December 2019.
S8 Entrepreneurial skills	S8V1	Financial literacy	→	→	→	Since numbers of sales are not going up for the majority of businesses, assumingly their finanical literacy is not much improving over time. Remains unchanged since December 2019.
	S8V2	Satisfaction level	▯	↗	▽	Very high perception of risks due to Covid-19; private companies concerned about competition through BBF and IDCOL programmes. Many businesses diversify to other products because they perceive it as risky to rely on ICS alone.
	S8V3	Marketing skills	→	→	↗	Some companies have started to move into e-commerce, online marketing (facebook, youtube etc.).
	S8V4	Advertising	→	→	↘	No advertising or marketing activities possible due to Covid-19.
	S8V5	Production automatization	▽	▽	▽	For installations, the service is optimised as to the knowledge of the trainers. There is little potential for mechanization and automatisation wich might be possible for portable stoves. Remains unchanged since December 2019.
	S8V6	Standardized production	▽	▽	▽	Production centers have a standardized production, yet there is too little information to see how the efficiency is developing over time. Quality of stoves is closely monitored via the programmes. Remains unchanged since December 2019. Quality higher if linked to provision of incentives / monitoring (higher than average for BBF).
D1 Product diversity	D1V1	Diversity	→	→	↘	There are several models of ICS in Bangladesh (23 types; only partially data available for 13 stove types) within tier 3 or 4. Each NGO offer mostly 1 type of training, therefore each small scale business offers 1 type of stove in rural areas, mostly concrete ICS. Some companies are reducing their stove activities since Covid-19, so less diversity.
D2 Market penetration	D2V1	Market penetration	↗	↗	→	from NAP data
D3 Willingness to pay	D3V1	Willingness to pay	→	→	↓	Customer's willingness to pay has declined due to lack/shortage of disposable income.
D4 Systems in use	D4V1	Usage rate	▽	▽	↘	Unable to determine current rate of usage during Covid-19 crisis. Stove stacking continues as a common practice. Usage rates are affected by shift to LPG / e-cooking.
	D4V2	Maintenance	▽	↗	↘	Due to Covid-19, deterioration of maintenance expected due to restriction of movement of maintenance staff.
D5 Replacement and repair	D5V1	Replacement rate	▽	▽	↘	Replacement rate expected to be down due to covid lockdown, but no up-to-date info available.
	D5V2	Repair rate	▽	▽	↘	Repair rate expected to be down due to movement restriction of staff.
D6 Consumer awareness and perception	D6V1	Awareness	↑	↑	→	No additional awareness activities taking place.
	D6V2	Perception	↗	↗	↗	Remains unchanged since December 2019. Positive perception of economics and health benefits of ICS not as wide spread as awareness.
E1 Policy	E1V1	National plans	↑	→	→	No further progress on National Action Plan due to Covid-19 lockdown.
	E1V2	Policy	↗	↗	↗	BTEB Bangladesh Technical Education Board is looking at skills development in the ICS sector.
	E1V3	Product taxes	↗	↗	↓	HEP lobbied with the Ministry of Commerce to reduce the taxes on improved cookstoves. Ongoing process since 2018, revision of idea in Juni 2019. For commercial products there is a VAT = 15%; 38% import taxes on ICS; LPG VAT exemption. No changes yet, but negative outlook due to bad fiscal situation.
	E1V4	Business taxes	→	→	→	The large majority of the small scale businesses do not pay taxes. No changes since December 2019.
E2 Access to finance	E2V1	Subsidies	→	→	→	Subsidy levels have reduced to around about 20%. No changes since December 2019.
	E2V2	Financing options suppliers	→	→	→	No financial options for businesses, although there is anecdotal knowledge about informal loans to invest in the businesses. No changes since December 2019.
	E2V3	Financing options consumers	↗	↗	▽	Some businesses offer payment in installments or informal credit systems via groups. However, BDIS Survey 2017 found that WTP in installments was much lower than cash. No changes since December 2019.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	↑	↓	BUET and BISR are doing the testing, however, not yet to ISO Standards (recommendations on how to enhance capacity). HEP informs about potetial quality codes and standards. CLASP assesses that the ICS market is not ready for mandatory standards but could set more ambitious voluntary targets. Delays likely as attention and resources are diverted to Covid-19.
	E3V2	Enforcement	▽	▽	▽	No changes since December 2019.
E4 Market information	E4V1	Cost of information	→	→	→	No market information available due to Covid-19 disruptions.
	E4V2	Market facilitation organizations	→	→	→	HEPs role as coordinator / knowledge hub is deteriorating. IDCOL organises exchange but only for its implementation partners. No proper business association exists, which is identified as a gap (e.g. compared to solar sector).
	E4V3	Awareness campaigns	↑	↑	↑	Currently disrupted, further development depends on Covid-19.
E5 Expertise development	E5V1	Courses	▽	▽	▽	Currently disrupted, might hopefully resume once Covid-19 abates.
	E5V2	BDT	→	→	→	Currently disrupted, might hopefully resume once Covid-19 abates.
	E5V3	User training	→	→	→	Users are trained by the small scale entrepreneur how to use the stove. High share of users state that this training was useful. No changes since December 2019.

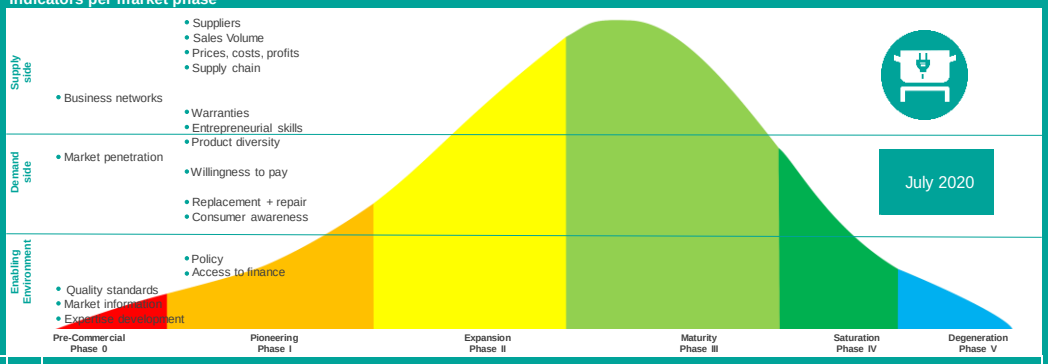
Summary EnDev Market Scorecard: Bangladesh July 2020 E-Cooking

Market: Market for over-the-counter sales on e-cooking devices of all types (rice cookers, induction stoves, infrared cooker, multicooker, microwave). One geographical area across all of Bangladesh.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase

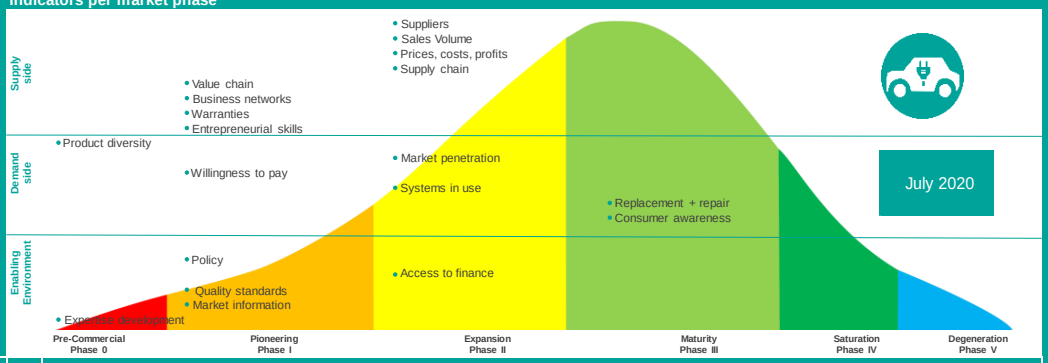


Indicators	Variables		July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	Clarification needed between "producers" (factories), and "traders" (shops). There is a few companies already offering the appliances. Different appliance types range from phase 0 to 2. 1 Mio. E-cooking households already exist according to draft NAP.
	S1V2	Business modalities	↗	E-cooking is a sub-activity for most companies, and there is a range from 0 (donor activities, CSR from international companies) to 2 (fully developed business cases).
	S1V3	Formality	→	Producers tend to be larger companies and formalised; many traders are informal.
	S1V4	Jobs created	↗	Domestic production is very limited, most are imported; there are a few jobs with traders (importers and distributors), but for almost all of them it's a side business
S2 Sales Volume	S2V1	Products / services sold	↗	Variation between different devices, but most devices still only affordable for medium to high income groups'
	S2V2	Inventory turnover	▯	No data available and too little insight to make an educated guess
S3 Prices, costs and profits	S3V1	Prices	↗	No donor involvement or subsidies visible, prices still very high compared to costs and willingness to pay.
	S3V2	Costs	→	Costs are assumed to be high. No donor subsidy is known in Bangladesh. Very weak data basis (almost rated as "not measured"). Remark: Explanation columns of "prices" and "costs" seem contradictory regarding the donor / subsidy part
	S3V3	Profit margin	↗	Profits are assumed to be low but some profits exist, otherwise private sector would not continue to engage.
	S3V4	Investments	→	In the current situation quite certain that there are no sizeable investments.
S4 Supply chain and after-sales service	S4V1	Length	↗	Short supply chains: import and production, then often a second step of retailing/distribution. For many products import and retail through the same company. Again very weak data bases and close to rating "not measured".
	S4V2	Distribution channels	↗	Market formation still on-going, mix of large household ware/appliance trading companies and more informal companies
	S4V3	Spatial reach	→	Traders serve their vicinity; very limited availability in remote rural areas
	S4V4	Initial suppliers	↗	Very limited information available, expert estimate, close to rating "not measured"
	S4V5	After-sales service	▽	So far limited scale of after-sales services, warranties available, but greater than none. No information on trend.
S5 Value chain	S5V1	Value added	▯	No information available.
S6 Business networks	S6V1	Networks	→	No business network, association etc. is known, and e-cooking is not a topic in existing household energy for a.
	S6V2	Partnerships	▽	No information available.
S7 Warranties	S7V1	Warranties	↗	International and domestic companies are providing warranties, but the extend and reliability varies. Also, significant market share to low quality non-brand products with no warranties.
S8 Entrepreneurial skills	S8V1	Financial literacy	▯	No information available. Very wide spread between companies.
	S8V2	Satisfaction level	↗	Suppliers see big potentials but are unhappy with current market and business (taxes, import duties, Corona) conditions.
	S8V3	Marketing skills	▽	Companies are marketing savy but little use arguments specific to advantages of e-cooking over other household energy solutions.
	S8V4	Advertising	▽	Local advertising in shops, very little observed in mass media.
	S8V5	Production automatization	▯	no information on production processes is available.
	S8V6	Standardized production	↗	Many domestic producers are assumed to be in phase 0, but also local production by some large companies (e.g. Walton). Imported is a mix (high quality brands vs. low quality devices).
D1 Product diversity	D1V1	Diversity	↗	For each device type different models and brands are available, but still large prevalence of low-quality devices.
D2 Market penetration	D2V1	Market penetration	↑	Market share currently 2-3% (as main stove) as per NAP; no surveys available on the trend as only NAP survey from 2019 is known. General impression is that there is a growth and that the growth is accellerating.
D3 Willingness to pay	D3V1	Willingness to pay	↗	Still high share of low-quality products. No subsidies etc. available so existing market functions.
D4 Systems in use	D4V1	Usage rate	▽	No information available. Stove stacking definitely continues, and there is some dissatisfaction with grid electricity relibility. On the other hand households will tend to use expensive appliance once bought.
	D4V2	Maintenance	▪	E-cooking appliances don't need maintenance, variable does not really apply.
D5 Replacement and repair	D5V1	Replacement rate	▯	Anecdotal evidence points to high replacement rates, but not enough information for grading
	D5V2	Repair rate	→	Consumers are very interested in repairs, shortages of skilled manpower. Again large variations between appliances (rice cookers can be easily repaired, induction cookers almost impossible)
D6 Consumer awareness and perception	D6V1	Awareness	↗	Expert assumptions, lack of surveys / hard data.
	D6V2	Perception	→	Expert assumptions, lack of surveys / hard data.
E1 Policy	E1V1	National plans	→	National Action plan (NAP) exists as a draft, but not adopted by Government yet.
	E1V2	Policy	→	National Action plan exists as a draft, but not adopted by Government yet. Policies of utilities / electricity sector regulations are also important in this context but we don't have up to date information. Utilities should have an interest to develop e-cooking.
	E1V3	Product taxes	▽	Rebates exist for "pro-environment" technologies, but unclear if e-cooking is included.
	E1V4	Business taxes	▽	Due to size and level of formality high rate of tax registration.
E2 Access to finance	E2V1	Subsidies	→	No government or donor subsidies in place
	E2V2	Financing options suppliers	→	list of green products exist to support business investment (access to finance for companies), but e-cooking not included
	E2V3	Financing options consumers	→	Limited offers exist for pricier, high-quality products in formal shops. Otherwise mostly cash payments.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	Topic starts to be discussed, but regulators have not yet taken up systematic work to develop standards.
	E3V2	Enforcement	→	No evidence for actual monitoring of standards by Government.
E4 Market information	E4V1	Cost of information	▽	very difficult to collect information, lack of market overview
	E4V2	Market facilitation organizations	→	No market facilitation organisation exists to our knowledge. Donors (MECS) might consider entering this work area but nothing specific yet.
	E4V3	Awareness campaigns	→	No government or donor awareness campaigns. Limited confidence that SREDA will strongly engage in this in the short term, not much in focus in NAP.
E5 Expertise development	E5V1	Courses	→	No courses or training provided by government or development organizations. Some informal training has been provided by the reputed e-cooking device marketing companies (Walton, Vision) for ensuring theirs after sales services. But still inadequate service centers and expert technicians & engineers in this sector. Early stage planning of MECS and EnDev, activities not started yet and no impact before mid 2021 expected.
	E5V2	BDT	→	No BDT courses known, and no initiative to introduce them.
	E5V3	User training	→	No user training known for pressure cookers, induction stoves etc. which actually shift cooking behaviour. Instruction needed how to use it, for which foods, etc. User-level training on electrical safety and efficient cooking will be required for getting the actual benefits and sustainable expansion of e-cooking devices.

Summary EnDev Market Scorecard: Bangladesh July 2020 E-vehicles

Market: Different types of light electric 3 and 4 wheelers for short and medium distance passenger transport, both conversion and "ready-made", both imported and domestically produced. Electric cars such as Tesla, Toyota etc. are exluded. Geographical areas: all of Bangladesh. Analysis irrespective of electricity source used for charging (both on- or off-grid, renewable or conventional).

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	-

Indicators		Variables	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	Quite large, and increasing number of companies
	S1V2	Business modalities	↗	Producers full time, quite differentiated structures. Factories for 4-wheelers are being invested in, at the same time still fragmented structures for 3-wheeler conversion etc. - so actually spread out from phase 1 to phase 3. Mix of specialised businesses and others with more diversified structures.
	S1V3	Formality	↗	Mix of registered companies in production, import etc., and informal companies involved in conversion of vehicles. But even smaller businesses have trade licenses. General efforts by government to formalize the sector.
	S1V4	Jobs created	↗	Manufacturing increasingly done in Bangladesh with larger and more formalised factories. In terms of drivers and maintenance / repair workers, not many additional jobs but rather modal shift (same drivers etc. now drive electric vehicles).
S2 Sales Volume	S2V1	Products / services sold	↗	Number of vehicles still increasing in peri-urban and rural areas; in urban areas getting close to phase III (mainly replacement).
	S2V2	Inventory turnover	↗	From observation at factories and traders/distribution turnover seems to be very quick, especially for newer models. Still good turnover rate for more established products like rikshaw conversion kits.
S3 Prices, costs and profits	S3V1	Prices	↑	Intense price competition, but still very limited interest in higher quality components (e.g. lithum batteries)
	S3V2	Costs	↔	Costs are low considering the current "lower quality" models; much higher for more advanced models. Costs for mass components might come down further with more domestic production, on the other hand transport costs currently quickly increase due to COVID-19 disruption.
	S3V3	Profit margin	↗	Intense competition but not due to maturity, due to accessibility of this market for many companies.
	S3V4	Investments	▽	Investment seems to continue despite COVID-19
S4 Supply chain and after-sales service	S4V1	Length	↑	import of components, production of domestic parts, and assembly mostly done within one company. There are some signs of a more differentiated structure emerging.
	S4V2	Distribution channels	↑	Quite professional marketing of vehicles; rikshaw conversion available even in remote regions
	S4V3	Spatial reach	→	Products available in whole country, only hill tract area (topography) and parts of Dhaka (regulatory restrictions). Spatial reach of individual producers varies widely.
	S4V4	Initial suppliers	↗	Quite large variety of suppliers
	S4V5	After-sales service	↗	Easily available for 4-wheelers, widespread for riskshaws
S5 Value chain	S5V1	Value added	↑	Still very large share of imported components (especially motors, controllers), but rapid shift to domestic production (batteries, vehicle bodies, tires, …).
S6 Business networks	S6V1	Networks	▽	No business associations specifically for e-vehicles are known. There are driver unions, and associations more generally for electrical equipment. Unknown if business networks are developing.
	S6V2	Partnerships	↑	Some partnerships such as supply chain agreements, servicing agreements with fleet operators, start to emerge.
S7 Warranties	S7V1	Warranties	→	Warranties exist but are often not honored, very difficult to actually get replacement/repair
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	Basic business skills exist but wide evidence of short-sighted business decisions e.g. rapid replacement of low quality batteries
	S8V2	Satisfaction level	▽	Overall high satisfaction, main bottlenecks mentioned are battery durability, hostile policies, high taxes and import duties. No information on trend.
	S8V3	Marketing skills	↑	Marketing often not formalised but quite effective
	S8V4	Advertising	↗	E-vehicle sales are B2B, so limited open advertising. No donor involvement.
	S8V5	Production automatization	↑	Very low automazation levels, even in factory producing 60,000 vehilces per year all metal cutting, welding, painting, assembly done by hand.
	S8V6	Standardized production	↑	standadised production only observed at very few manufacturers
D1 Product diversity	D1V1	Diversity	↑	A few basic designs dominate, replicated by all producers with minimal variations.
D2 Market penetration	D2V1	Market penetration	↑	Lack of solid, nation-wide data. Generally, high to very high market shares already achieved but large quality, safety issues remain (see other variables). Very large regional variations. Estimates of around 1 to 1.5 million e-vehicles in newspapers, but no solid info.
D3 Willingness to pay	D3V1	Willingness to pay	↑	High willingness to pay for low-cost, low-quality vehicles which currently fill the whole market, but very low willingness to pay for higher quality components (e.g. LI batteries).
D4 Systems in use	D4V1	Usage rate		Generally very high usage rates, but there are also examples where electric "easy bikes" are converted to two-stroke engines again.
	D4V2	Maintenance	▽	Most users know how to take care of and maintain vehicles. No information on the trend
D5 Replacement and repair	D5V1	Replacement rate	↑	High replacement rates when a vehicle becomes unusable.
	D5V2	Repair rate	→	Repair rate is close to 100%, vehicles are too expensive to abandon them. However many users are unsatisfied with the durability of vehicles and specific components (esp. batteries).
D6 Consumer awareness and perception	D6V1	Awareness	▽	Awareness about electric vehicles is universal for all vehicle owners / operators / drivers.
	D6V2	Perception	↑	Electric propulsion is seen positively by a large share of consumers, but due to practical impediments (regulation, speed, carrying capacity, comfort, capital investment needed) manual, gas or petrol propulsion is still selected often.
E1 Policy	E1V1	National plans	→	National plan for e-vehicle charging is under preparation, but no plan for all aspects of e-mobility is known (also not under preparation). BRTA is working on electric vehicle registration, but focusses on cars and buses, not light vehicles.
	E1V2	Policy	↗	No official policies are in place, but national level Government has moved from negative to positive perception. Different local governments/city corporations (under instruction from national govt) started registering vehicles, and try to limit numbers to control congestion.
	E1V3	Product taxes	→	No tax relief exists and there are no plans to introduce it.
	E1V4	Business taxes	↑	No solid data, again difference between large importers/producers, and small informal companies. No estimate across the whole market possible. Significant tax load on the sector due to high import and business taxes.
E2 Access to finance	E2V1	Subsidies	→	No direct or indirect subsidies known, no plans to introduce them. Seen as a justified mechanism by experts.
	E2V2	Financing options suppliers	→	Few financial institutions offer financing, IDCOL is looking into sector but commercial banks are reluctant, due to unregulated character of the sector.
	E2V3	Financing options consumers	→	Micro-finance is available in some areas, if there is a good business case for the investment. Little offered by banks.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	No regulations, norms and standards are in place as these e-vehicles are not regulated yet. Work on e-vehicle charing policy has started. Other quality regulations also under preparation.
	E3V2	Enforcement	↗	No national level regulations in place yet. Many local governments have started registration systems etc. on their own.
E4 Market information	E4V1	Cost of information	↗	Relatively easy to get an overview of prices etc.; more difficult to assess quality of products.
	E4V2	Market facilitation organizations	▽	No formalised market facilitation organisations dedicated to this market are known; some NGOs/micro credit organisation providing investment loans will provide market overview information.
	E4V3	Awareness campaigns	↗	No awareness raising campaigns by government or donors. Government discouraged e-vehciles until recently, but now shift is in place, e.g. instruction to utilities to do e-vehicle charging station pilots.
E5 Expertise development	E5V1	Courses	▽	No courses are available, all learning is generalised (mechanical, electrical) or hands-on "learning on the job". Unclear if there are current initiatives.
	E5V2	BDT	▽	No business development training courses known. Unclear if there are current initiatives.
	E5V3	User training	→	Businesses offer limited informal training, but no formal trainings. No government or donor involvement. No requirement for driving licenses.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Support to SREDA in implementing the **National Action Plan for Clean Cookstoves 2020-2030**, and in sector coordination (incl. alignment of IDCOL and BBF programmes) through capacity development, provision of international experts etc. • Support to establishment of **national strategic action plans** for electricity access areas (e.g. electric mobility, agriculture) as basis for accelerated deployment of supported technologies and measures to improve framework conditions (e.g. reduction of taxes and import tariffs, security for banks to finance technologies etc.). • Develop partnerships with other donors (e.g. WB) and civil society (e.g. Bangladesh Rural Advancement Committee/BRAC) to **maximize influence**; Bangladesh has proven in other development sectors that with high political prioritisation rapid transformational change can happen. • Position clean cooking (ICS and electric) as **urgent health topic** on the Government agenda to achieve high level political support as game-changer for exponential growth.
Supply side	• Continued **capacity development** of suppliers to address transition to a truly market-driven, sustainable environment based on competition (overcome duopoly of BBF and IDCOL). • Early market stage **E-cooking sector**: strengthening of supplier networks, elaboration of detailed market studies, building on results: developing an e-cooking RBF for scaling up a sustainable e-cooking appliance market. • Address lack of independent and **quality testing facilities** for ICS and electric PU appliances: EnDev to consider stepping in ICS testing/ certification after IDCOL and BCSIR efforts have stalled; awareness raising for CLASP LEAP quality awards. • Support to energy services companies in terms of **access to finance** to scale business.
Demand side	• Clean cooking sector: support for **consumer education** especially for e-cooking (appropriate use of appliances to maximise benefits and achieve sustainable use). • Facilitation of **access to finance** to purchase high value PU appliances (e.g. pumps, lithium batteries, …) and higher tier electrification systems for households and SME, working with financial institutions including micro-credit institutions. • Cooperation with health institutions to increase **awareness on health benefits** of clean cooking considering increased urgency due to COVID-19 (higher suspectibility for persons living in polluted air conditions).

Other	• Support and scaling of electric mobility as PU initiative can build on existing **partnerships with electric mobility sector stakeholders** (incl. GIZ, TUMI) and align with currently prepared project on climate friendly mobility in the frame of the German Climate Technology Initiative (DKTI).
	• Working with **Rohingya refugee communities** has large potential, but is politically sensitive, and strictly controlled by Government institutions. This may shift over the next phase, and opportunities for engagement might emerge.

Benin

Section 1: Key facts

Country facts	
Population	11.5 million
HDI	163 ↑ | Total (0.52)
UN Classification	LDC
Access clean cooking	8.0 % urban < 5 % rural
Access electricity	67 % urban 18 % rural

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
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio

Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• Energy is a **priority sector for the government** and receives 10% of the national budget while the economy develops at above 6%, providing confidence to investors. • With power generation as well as gas and power transport lines already consolidated, priority for the coming years is on implementation of the **Master Plan for Off-Grid Electrification** (*Plan Directeur d'Electrification Hors Réseau*) with EnDev as a major partner. • **High demand for off-grid solar technologies** (picoPV and SHS) 71% of clients of EnDev's local partner companies had no access to any kind of modern energy before. • The government intends to increase the **access to ICS** to 53% of the population by 2025; to this end, EnDev is a key partner to develop and implement the **National Action Plan for Clean Cooking** and the setting up of the **National Committee for Cooking Energy**. • **High demand for ICS** as only 17,64% of households use 1- to 2-tier ICS for cooking; EnDev's supported local partner companies cover 85% of the ICS market.
Contribution to paradigm shift	• Support to 15 selected private ICS producers to bring them to a **semi-industrial production stage** for developed, highly efficient 2-tier ICS that will eventually cover the entire national demand. • Implementation of a 'RBF *défis*' to promote the **extension of distribution networks** into rural areas and the commercialisation of higher-tier ICS (including e-cooking). • Reinforcement of the capacities of the 'Laboratoire d'Energétique et de Mécanique Appliquée' (LEMA) to become a **self-sustained ICS lab provider** of technical expertise and innovation: performance tests, models for PU and SI, use of agriculture and forestry residues as alternative fuels, etc. • Support to scaling up **picoPV and SHS business** of more than 20 private solar companies with EnDev's new 'RBF ménages' • Attract **new international solar companies** while already many of EnDev's partner companies with highest sales are subsidiaries of multinationals. • Promotion of sustainable sector development through **quality of solar products and services** to (improvement of the regulatory framework; using products certified by Global Lighting Africa, capacity building in the full value chain) and supporting the government to explore solutions for **electric waste treatment**.

Important collaborations for scaling up	**Funding and investment** • **EU funded RECASED programme** (10 million Euro) in support to ICS and solar companies; EnDev co-finances complementary market studies for the cooking sector and joint activities. • **EU** puts a focus on off-grid and ICS support in their **planning period 2021-2027**; EnDev follows up with the EU Delegation on co-financing possibilities and aims at aligning EnDev proposal (2021-2024) with the multiannual financial framework (2021-2027) of the EU for Benin. • **World Bank PASE programme** (ICS component with 5 million USD focusing on urban clean cooking) adopted EnDev's market driven ICS development approach. • New **World Bank** off and on-grid energy access programme (50 million USD for power generation/distribution and a small off-grid component) also used EnDev's RBF facility experiences. • **Millenium Challenge Account** (MCA, 300 million USD energy project with focus on generation/distribution and a smaller off-grid component; MCA helps to attract international companies to Benin; EnDev's RBF experiences were used. • EnDev **supports negotiations** of local solar and ICS companies with national sector ministries (e.g. *Ministère des Affaires Sociales et les Microfinances*) and international organisations (e.g. UN World Food Programme) with regard to investments.
	Implementation • Scaling through **close cooperation with national authorities** (Ministry of Energy, General Department for Energy/DGRE, Solar Agency ABERME) on enabeling environnement for off-grid solar (quality standards for solar products and quality certificates for solar companies; electric waste, promotion of PUE). • Support to scaling of EnDev's activities through close cooperation with **GIZ-implemented sector projects** (Pro-Agri, ProCIVA; regional project PROMERC).
	Knowledge sharing and learning • Good coordination between the international actors in the energy sector through regular **solar sector meetings**. • The currently developed **National ICS Committee** will constitute the key stakeholder platform for exchange and future ICS market development. • Knowledge sharing on mini-grids with **GIZ implemented (regional) projects** in West Africa.
Gender	• **Gender analysis** for EnDev Benin about to be completed. • EnDev Benin is actively partnering with the Ministry of Energy's **gender unit** (*Cellule Genre*) and supports the Ministry's specific **gender plan** (*Plan d'Action National pour la Politique d'Intégration du Genre dans l'Accès à l'Énergie*).

Consideration of ITAC recommendation

Collaborations with other EnDev projects*:* Interaction with all GIZ energy projects through the co-facilitation of the GIZ "Biomass" working group for Subsaharan Africa. Having provided targeted support to Senegal (solar) and Togo (ICS) in the past there is no specific collaborations today.

Collaboration with Green People's Energy (GBE) project in Benin: GBE pilots new solar approaches for SI and PU. Lessons learnt from the GBE project will be included in EnDev's in the forthcoming project proposal.

Affordability and customer financing: 90% of EnDev supported sales have a PAYGO modality with a low payment rate. Institutionalisation of the administration of EnDev's RBF's (currently run by EnDev itself) is until now not possible as no local finance institution is capable and interested in implementing a RBF or RE project. Discussions with EU include possible future collaborations with (micro) finance institutions.

Lighting Global quality verification: Since 01/04/2020, this is a prerequisite for all solar kits under EnDev Benin.

Quality verification of component-based systems: Discussions are ongoing with the government to complete the regulatory framework that will guarantee the quality and efficiency of all imported solar systems and components.

Electric waste: EnDev supports the government to develop an electric waste regulatory framework and, eventually, carry out a pilot activity. An analysis of the quantity of electric waste to be treated had been financed b EnDev.

Master Plan for Off-Grid Electrification: Such as master plan exists since end 2019 (*Plan Directeur d'Electrification Hors Réseau*) and forms the basis for EnDev's interventions in the off-grid sector.

Targeted SMEs for ICS support: EnDev is about to launch the 'RBF défis' which will target SME's ready to extend their distribution into remote areas. To this end EnDEv is exploring collaboration with the Fédération des Caisses d'Epargne et de Crédit Agricole Mutuel (FECECAM). Complementary EnDev cooperates with sector GIZ projects in Benin (Pro Agri, ProCIVA) that promote entrepreneurship in the agribusiness sector.

Qualifications of local ICS work force: EnDev develops capacities of ICS partner companies on production techniques, financial management and marketing. We train the leaders of the National Association of ICS producers on advocacy and lobbying.

Targeted SIs: EnDev supports the National Association of ICS producers in the negotiation of a contract with the UN World Food Programme to equip 200 school canteens all over the country. Parallel, the GBE project explores the installation of solar PV electrification systems in some of the schools.

Gender equity: Promotion of women in high responsibility positions is a priority for EnDev Benin. See gender section above.

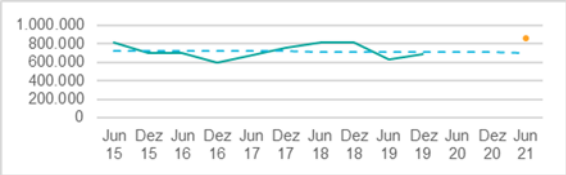
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

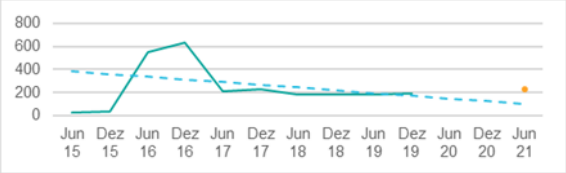
HH Access Cooking

Targets: 865,000 Achieved: 688,832



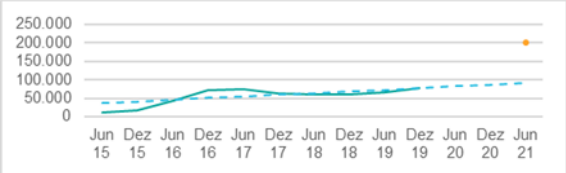
SI Access

Targets: 225 Achieved: 194



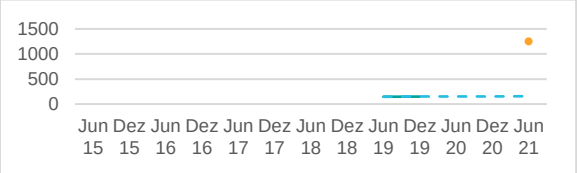
HH Access Electricity

Targets: 200,000 Achieved: 78,148



PU Access

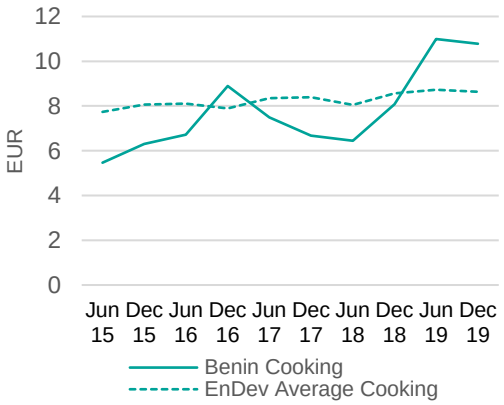
Targets: 1,250 Achieved: 149

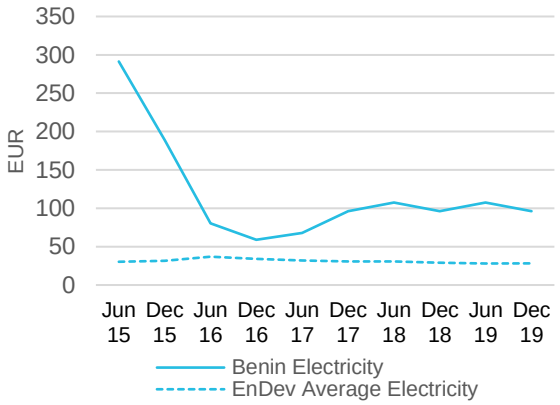


Additional info

- **HH Access cooking**: EnDev Benin is confident to reach the target despite the COVID-19 pandemic. The support to the professionalization a limited number of enterprises which are covering about 85% of the market proves to bring more resilience to the ICS market. New initiatives have also started since December 2019 to bring more accesses such as the opening of new intervention zones with the support of the local authorities, and also the RBF support scheme put in place to support last miles sales.
- **HH Access electricity**: A FCDO supported RBF ended in 10/2019 leaving a slight gap until 01/2020 when a new RBF fund was launched by EnDev. This new RBF fund will allow EnDev to increase rapidly the number of households within the existing budget, however, there might be impacts of COVID-19 on this expected development.
- **Access to stoves for PU:** From 2009 to June 2019, there was no expected PU access target. However, since July 2019, the planned outcome target is set at 1,250 SMEs. Since then a range of technologies have been identified and brought into the market by long-term partner stove enterprises. The GIZ agricultural programmes, the World Food Programme, and local authorities are collaborating to introduce these technologies to their stakeholders. Other PU and SI electricity access approaches are currently covered by the GBE country project and the respective experiences will be integrated in the next EnDev planning phase for scaling up.

Efficiency





Additional info

- **Cooking efficiency**: The cost efficiency of cooking technologies were above the EnDev benchmark between December 18 and June 19 due to the development of large infrastructures for 15 priority ICS producers. The professionalisation of these producers starts to improve cost efficiency since mid-2019. EnDev Benin is confident that the efficiency will be soon back below the benchmark.
- **Electricity efficiency**: Since July 2019, EnDev Benin is focusing on household access only, and GBE Benin is implementing solar PU and SI activities. Therefore, some PU technologies with higher costs like solar pumping were removed from the programme causing a decreasing trend of the curve since July 2019 and this is expected to continue in 2020 (provided that the COVID-19 impacts are limited).

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

The **solar off-grid market** is in an early expansion phase. The support provided by EnDev for the development of the solar off-grid market in the period 2014-2019 was decisive to introduce the use of quality certificates, attract international players and foster the professionalisation of the sector. This trend will be consolidated by further support provided by EnDev as well as by new initiatives implemented by GBE, MCA and WB. Since the electrification rate is very low in rural areas, there is room for further market development and participation of new actors, mainly for those interested in conquering rural market niches. A large potential also exist in the use of solar systems for productive applications because only some 4% of current clients use the system to generate revenues. The enabeling environment for the solar off-grid market has well developed. A formal regulation on tax exemption for solar products is in force since 01/01/2020. Although some improvements are still needed, this provides confidence to investors. The government is determined to apply certifications to guarantee the quality of products and service providers (design, installation, post-sales guarantee, maintenance, etc.). This will provide confidence to consumers and stimulate the demand.

Cooking Sector

The ICS market is still the pioneering phase, however, with good potential to enter into the expansion phase. A large proportion (85%) of the ICS sold in the national market belong to the "ANFANI" certified brand (tier-2), and 60% of these have been supplied by the 15 producers EnDev is focusing on. Producers and distributors are becoming better organised and more professional under the leadership of the national cooking association. There is clearly potential for the further development of the ICS market. Overall demand is higher than offer but the lack of consolidated distribution networks is a serious constraint to serve rural areas. Lack of higher tier ICS models adapted to PU and SI needs is also a challenge and a chance for the sector. The development of national norms for ICS is ongoing. Once completed, this will be a milestone towards the professionalisation of the ICS market. Recently, larger companies have shown their interest in the distribution and commercialisation of ICS.

Impact of COVID-19

Both markets - ICS and solar – are experiencing an important setback as a consequence of the impact of COVID-19. Sales in solar products experience reductions of about 40% and sales of ICS have decreased by about 25% for clay stoves and about 60% for metallic ones. The situation will become more critical when the global economy, from which Benin is dependent, enters in recession. In the months to come our partner companies might be forced to reduce their size, dismiss staff and even close business. It must be anticipated that the results that EnDev Benin will achieve during 2020 will be radically lower than under normal conditions. EnDev Benin reallocated budget for COVID-19 response measures; additional 2 million Euro were requested for this purpose.

Summary EnDev Market Scorecard: Benin July 2020 Solar Products

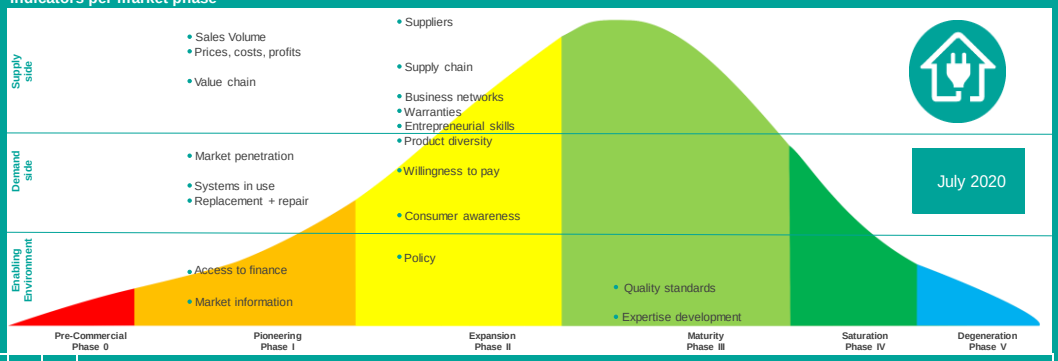
Market:

The market is characterized by the arrival of several other donors in the sector. Apart from EnDev, we have the MCA-2, the European Union.
In terms of actors, we see the arrival of foreign firms with much more resources than local players. Product sales have soared.
Households have a variety of products at their disposal and PAYGO payment systems are introduced into the market resulting in increased sales.
The players in the sector organize themselves in association. Quality standards are adopted at the national level and regulate the market.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↑	New companies are entering the market. Business activity has been shut down or slowed down. Covid-19 has disrupted business planning.
	S1V2	Business modalities	↗	↑	Distribution models of the products has not changed. PAYGO is subjected to a lot of questioning.
	S1V3	Formality	↗	↑	
	S1V4	Jobs created	↑	↓	The jolts of the pandemic strongly influenced job creation with a downward trend.
S2 Sales Volume	S2V1	Products / services sold	↑	↓	The crisis has slowed sales activity and the importation of new products
	S2V2	Inventory turnover	↑	↓	Since products are no longer sold, reciprocity is noticeable in terms of sales
S3 Prices, costs and profits	S3V1	Prices	↑	↑	Despite the increase in transportation costs, companies have maintained sales prices to retain customers.
	S3V2	Costs	↗	↘	The increase in freight costs created by the pandemic
	S3V3	Profit margin	↗	↓	Margins are reduced due to high transport costs
	S3V4	Investments	↗	↓	Only companies with contracts continue to make investments to meet their commitment.
S4 Supply chain and after-sales service	S4V1	Length	↗	↗	Import, sale and distribution are carried out by the same entity
	S4V2	Distribution channels	↑	↓	The pandemic has strongly influenced distributors' distribution channels.
	S4V3	Spatial reach	↑	↓	Pandemic limits movement to remote areas of business establishment locations.
	S4V4	Initial suppliers	↑	↑	The pandemic has not affected the variety of products and several players remain in the prospect of bringing new product that have been delayed by Covid-19.
	S4V5	After-sales service	↑	↓	Travel is also more expensive and limited.
S5 Value chain	S5V1	Value added	↗	↗	Most imported products have already undergone all the transformations. Companies are only sometimes involved in the assembly and distibution.
S6 Business networks	S6V1	Networks	→	→	The actions of the various associations are no longer visible because of the crisis.
	S6V2	Partnerships	↗	→	The expression of these partnerships are confronted with the realities created by the Covid-19.
S7 Warranties	S7V1	Warranties	↑	↑	The quality of the products required as well as the verification methods require companies to offer a functional guarantee on the products sold. Minimum functional warranty of 12 months on products and can go to 24 months and more.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	→	There are two categories to be distinguished; foreign firms and some local firms have good business skills and the second category of companies that needs capacity building.
	S8V2	Satisfaction level	↘	↘	No one knows when the crisis will end (uncertain outcome).
	S8V3	Marketing skills	↗	↗	Local players have become aware that marketing is a very important aspect but their financial flexibility is often limited.
	S8V4	Advertising	↗	↓	Local equities have declined and companies are turning to digital marketing for those who have more resources because of the crisis.
	S8V5	Production automatization	▪	▯	
	S8V6	Standardized production	▯	▯	
D1 Product diversity	D1V1	Diversity	↑	→	The market offers a variety of products and services to households depending on how they want to use them. The variety of new products is not recognized due to the difficulty related to the duration of import of orders.
D2 Market penetration	D2V1	Market penetration	↑	→	Market development is stagnant.
D3 Willingness to pay	D3V1	Willingness to pay	↑	↓	As pandemia has threatened customers' sources of income, companies are finding it difficult to make collections.
D4 Systems in use	D4V1	Usage rate	↑	↑	The pandemic has forced many people to work from home.
	D4V2	Maintenance	↑	↓	The presence of companies is no longer common on the ground.
D5 Replacement and repair	D5V1	Replacement rate	▯	▯	
	D5V2	Repair rate	↑	↓	The pandemic does not allow technicians to move easily.
D6 Consumer awareness and perception	D6V1	Awareness	↑	↓	Pandemic limits awareness-raising activities.
	D6V2	Perception	↑	↓	Proximity actions that allow consumers to distinguish products are stagnant.
E1 Policy	E1V1	National plans	↑	↑	The Government has clearly described the renewable energy targets through the Government's Programme of Action (PAG).
	E1V2	Policy	↑	↑	The renewable energy sector is well coordinated by regulatory agencies set up by the Gourvenement and the laws and regulations that govern the sector exist and can be improved.
	E1V3	Product taxes	↗	↓	Finance laws exempt certain tariffs on imported solar products but with the pandemic there are less imports and difficulties in implementing the procedure.
	E1V4	Business taxes	↑	↑	All of the companies that are partners in the programme have up-to-date documents to be able to enter the programme.
E2 Access to finance	E2V1	Subsidies	↘	↘	There are plans to support the sector.
	E2V2	Financing options suppliers	→	→	The financing market remains a real challenge for companies.
	E2V3	Financing options consumers	↑	↑	In addition to PAYGO models, some companies negotiate with microfinance institutions to facilitate the acquisition of products to their customers (micro-finance client).
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	↑	As part of the execution of our program there is certain quality requirement on this range of products namely the Lighting Global certification; in general it is the IEC standards that are required in the sector.
	E3V2	Enforcement	↑	↑	The renewable energy sector is well structured. Regulatory institutions exist. Businesses comply with regulations.
E4 Market information	E4V1	Cost of information	↑	↓	The current situation with the pandemic limits the efforts of TFPs.
	E4V2	Market facilitation organizations	↑	↑	Incentives and state provisions facilitate market access.
	E4V3	Awareness campaigns	→	→	Outreach operations are maintained by donors who bury in the area.
E5 Expertise development	E5V1	Courses	↑	↓	Several universities are involved in the training. Some donors are also supporting the sector through capacity building. Some programs have been discontinued because of the pandemic.
	E5V2	BDT	▯	▯	
	E5V3	User training	↗	↓	Most companies train users for good use as the equipment is under warranty. Donors continue to raise awareness, especially for the implementation of good practice posters among users. But with the crisis, there are less sales.

Summary EnDev Market Scorecard: Benin July 2020 Improved cookstoves

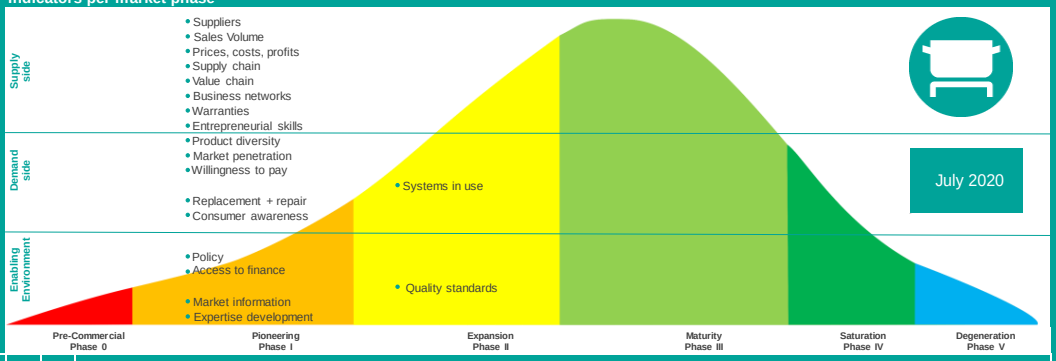
Market:

In Benin, the development of the market for improved cookstoves is at a critical juncture between the pioneering and expansion phases. According to national statistics, access to ICS reached 17% in 2019 and EnDev as the main TFP has largely contributed to this. Demand remains strong overall with an increasingly pronounced trend for cooking equipment for productive use, although low purchasing power remains the major constraint. Supply is dominated by the "ANFANI" range of ICS (85% of the global ICS supply), 60% of which is produced locally by the 15 companies supported by EnDev. This offer initiates a greater diversification with the introduction on the market of new models for PU&IS. The players are becoming better organized and more professional under the leadership of EnDev, and we note the emergence of major companies that are investing in the promotion of ICS.

Indicators per market phase

Market trends

Positive ↑
Slight positive ↗
Stagnation →
Slight negative ↘
Negative ↓
Conflicting ↔
Unknown ▽
Not measured ▯
Doesn't apply ▪



Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	→	New businesses are more cautious about COVID-19.
	S1V2	Business modalities	→	↘	The market has shrunk further and some companies (25%) have switched to part-time commercial activities.
	S1V3	Formality	↗	→	Shrinking market has slowed the trend towards formalisation of distribution companies.
	S1V4	Jobs created	→	↘	The market has shrunk further and some companies (25%) have switched to part-time commercial activities with a reduction in the number of workers.
S2 Sales Volume	S2V1	Products / services sold	↘	↓	Companies are facing a situation of slump due to the decline in the purchasing power of customers.
	S2V2	Inventory turnover	→	↘	Companies are hardly ever sourcing (raw materials) any more. They are trying to get their current stocks out of ICS.
S3 Prices, costs and profits	S3V1	Prices	→	↘	Companies are obliged to make promotional sales to sell some of their products.
	S3V2	Costs	↗	↗	Depreciation costs are still high in view of the continuing fall in sales volumes.
	S3V3	Profit margin	→	↘	
	S3V4	Investments	→	↓	Businesses are no longer making investments due to lower profit margins.
S4 Supply chain and after-sales service	S4V1	Length	↗	→	
	S4V2	Distribution channels	↗	→	
	S4V3	Spatial reach	↗	→	
	S4V4	Initial suppliers	↗	→	
	S4V5	After-sales service	↗	→	
S5 Value chain	S5V1	Value added	→	↘	Turnover declined due to lower sales and prices.
S6 Business networks	S6V1	Networks	↗	→	
	S6V2	Partnerships	↗	→	
S7 Warranties	S7V1	Warranties	→	→	
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	↗	
	S8V2	Satisfaction level	→	↘	Growing uncertainty about COVID-19
	S8V3	Marketing skills	↗	→	Companies are taking less and less risk to invest in marketing training.
	S8V4	Advertising	→	↓	
	S8V5	Production automatization	↗	→	The drop in market demand does not allow companies to continue their efforts to optimise the production process.
	S8V6	Standardized production	↑	↑	
D1 Product diversity	D1V1	Diversity	↗	↗	
D2 Market penetration	D2V1	Market penetration	↗	→	
D3 Willingness to pay	D3V1	Willingness to pay	↗	→	Reduction in consumer purchasing power
D4 Systems in use	D4V1	Usage rate	→	→	
	D4V2	Maintenance	↗	↗	
D5 Replacement and repair	D5V1	Replacement rate	↗	→	Lower revenues curb replacements.
	D5V2	Repair rate	↗	→	Declining revenue slows down repairs.
D6 Consumer awareness and perception	D6V1	Awareness	↗	→	Reduction of awareness-raising actions
	D6V2	Perception	↑	↑	
E1 Policy	E1V1	National plans	↑	↑	
	E1V2	Policy	↑	↑	
	E1V3	Product taxes	↗	↗	
	E1V4	Business taxes	↑	→	Businesses can no longer afford to pay taxes.
E2 Access to finance	E2V1	Subsidies	↘	↗	Short-term business support in response to COVID-19
	E2V2	Financing options suppliers	↗	→	Financial institutions are more reluctant
	E2V3	Financing options consumers	↗	↗	
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	→	Delay in implementation of standards due to COVID-19
	E3V2	Enforcement	↑	→	Funding for laboratory capacity building remains a challenge in the context of COVID-19.
E4 Market information	E4V1	Cost of information	→	↗	Need for a little more market support
	E4V2	Market facilitation organizations	↗	↗	
	E4V3	Awareness campaigns	↗	↗	
E5 Expertise development	E5V1	Courses	↗	→	Reduced access to donor funding
	E5V2	BDT	↑	→	Possibility of reduced face-to-face training
	E5V3	User training	↗	→	Possibility of reduced face-to-face training

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Further support to elaboration of the **National Action Plan for Clean Cooking** and the setting up of the **National Committee for Cooking Energy** as key elements for ICS sector transition. • Support to development of national **ICS standards** and to an **ICS reference laboratory.** • Scaling through integration of ICS promotion in the **national social protection agenda**. • Consolidation of the national **cookstove and solar associations** as key partner for the professionalisation of both sub-sectors. • Completion and improvement of **import tax regulations** for solar products and application of minimum standards for all imported products (e.g. Global Lighting Standard). • Integration of the **treatment of solar residues** in existing electrification regulations. • Cooperation with **financing institutions** to test approaches to improve access to finance for ICS/solar companies and customers.
Supply side	• Further support to EnDev's ICS partner companies to uplift their production to a fully **professional semi-industrialised stage**. • Identification of **higher tier ICS models** to be integrated into the product offer of companies to respond to high potential for **PU & SI needs**. • Extension of **ICS and solar distribution networks** to rural areas (solar: potential for a 'RBF last-mile') and support to engagement of **new, larger companies** in the ICS and solar distribution chains including improved after-sales services (solar: partnerships between international and local companies). • Development of a **certification programme** for solar installation and commercialisation companies. • Development of **electric waste treatment services**; potential for a 'RBF electric waste'.
Demand side	• Set-up of a first **pro-poor subsidy scheme** for ICS/solar for vulnerable groups and social institutions based on discount vouchers and flexible acquisition conditions. • **Sensitisation campaigns**, including TV and radio messages, with focus on four axes: 1) how to identify and advantages of using certified products; 2) opportunities for mini and small entrepreneurs based on productive use applications; 3) environmental and health risks of using inefficient equipment; 4) prevention measures against COVID-19 along with distribution of hand washing kits for retailers and vendors.
Other	• Promotion of **gender equity** in collaboration with the Ministry of Energy's gender unit ('*Cellule Genre*') and ENERGIA. Promotion of women in high responsibility positions as a priority.

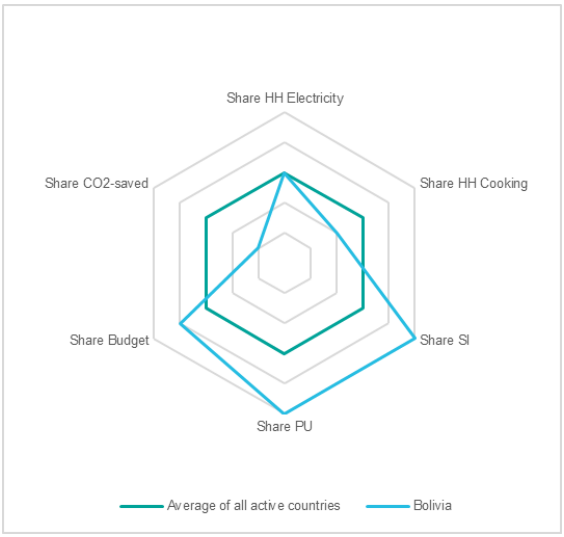
Bolivia

Section 1: Key facts

Country facts	
Population	11.4 million
HDI	114 ↑ | Total (0.71)
UN Classification	Developing Economy
Access clean cooking	> 95 % urban 53 % rural
Access electricity	100 % urban 86 % rural

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
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev has a key role in promoting **commercially driven approaches** and sustainable business models for energy access and productive use in a country where government policy is not priorizing private markets and improving the business environment. • Nevertheless, EnDev's support is closely aligned with **national government policies**, especially the objectives to achieve high electrification rates and to support the local economic development through productive use of electricity in on-grid areas. • Since 2006, **rural electrification** in Bolivia has increased from 33% to 86%, of which EnDev provided access to over 400,000 people through grid densification support and scaling the national solar market; reaching 35% of the economically active population of rural areas with modern energy since 2006; and avoiding annual GHG emissions of over 60,000 tons of CO2 equivalent (CO2eq). • Through solar PV and grid-connected water pumping systems, EnDev connected more than 2,300 hectares to **agricultural irrigation** with 23.000 additional tons of agricultural produce linked to local food markets.
Contribution to paradigm shift	• EnDev approaches are ready for further scaling up especially in the field of **higher-tier productive use of on-grid electricity** (PUE) promoting larger-scale machinery for agricultural production (e.g. water pumps), agro-processing (e.g. milk cooling) and other rural economic activities. • Further growth in grid connection and PUE possible through EnDev's work with **rural cooperatives and (international) NGOs**; potential to contribute to the provision of off-grid access to electricity to half of the still unconnected rural population (equals 7% of overall rural population - other half without access will be covered trough grid connection provided by the government). • **Professionalization** and strengthening of **local electricity distribution companies and rural cooperatives** through promotion of new technologies and approaches like smart metering, pre-paid systems, energy efficiency to improve service, reliability and sustainability of access. • Rural private sector (particularly women entrepreneurs) prepared for further market development by strengthening **business management skills**, product differentiation and facilitating opportunities to engage with the financial sector. • Contribution to further sector transition through supported **expansion of local or regional (Peruvian) companies** and start-ups to tap into the market potential for new technologies.

Important collaborations for scaling up	**Funding and investment** • Sustainable scaling supported through the **Fund for Sustainable Access to Renewable Energies (FASERTe)** set up in collaboration with the Inter-American Institute for Cooperation on Agriculture (IICA) building on experiences of EnDev in Peru. • The Fund is constructed as a basket fund (i.e. other interested parties can also contribute) and supports companies with new technologies and business approaches to support **scaling up of different technologies** (PUE, SHS, picoPV etc.) on a competitive basis. • The Basket Fund has already included a **COVID-19 response initiative** into its portfolio and puts a focus on support of female entrepreneurs. • FASERTe also connects entrepreneurs with the **financial sector** and a dialogue is ongoing with the Productive Development Bank (BDP) through resources from the **Green Climate Fund** to collaborate on applying "green funds" in the area of PUE; likewise, FASERTe will facilitate linkage to Peruvian companies interested to expand into the Bolivian market.
	Implementation • A key partner for scaling up PUE activities is **Practical Action (PA) Bolivia**, who supports as sub-contractor SMEs and productive organizations in value chains of selected regions (Yungas and Altiplano); use of scaling up potential through synergies with PA's agricultural portfolio. • EnDev's **PUE network** is further strengthened through agreements signed with the Dutch organization Agritierra, and the local NGOs Agrecol ANDES and APCOB, and leveraging resources from the Italian cooperation and North American foundations. • Dialogue has started with the Canadian NGO '**Développement International Desjardins**' (DID), to promote the strengthening of women's economic power and equal financial opportunities. • For scaling in the national solar market (SHS, picoPV, etc.), EnDev is collaborating with three **major national suppliers** (ENERGETICA, SIESA and ENERSOL) which combine diverse product choices, distribution channels and services.

	Knowledge sharing and learning • Given many larger organisations and donors have pulled out from Bolivia, EnDev plays a **central role in connecting relevant partners** like public actors (ministries), regional institutions like IICA, NGOs, international cooperations, the private sector and civil society and organising exchange of experiences in the energy access sector. • During **COVID-19** technical exchange of experiences, linking supply and demand, was intensified with distributors and rural cooperatives, and other partners through **digital media events** (series of webinars e.g. on SMART Metering, PUE- Energy & Gender); access and networking with target groups intensified. • Exchange with the **bilateral energy project** supported by the German BMZ which provides political advice for the energy sector.
Gender	• A **gender analysis** has been developed and a gender strategy mainstreamed into all four components of EnDev. Implementation had to be postponed due to civil unrest in Bolivia in 2019 and COVID-19. • **Gender has a prominent place** in all EnDev's activities in Bolivia since its inception, e.g. EnDev supports women leaders, promoting their inclusion in gender-sensitive value chains. Their capacities are developed and strengthened so that they can autonomously perform activities that were traditionally assigned to men. Telephone helplines are highlighted in electricity consumption bills and materials. Along with bilateral GIZ projects, EnDev collaborates with the GIZ Community of Practice on gender and energy.

Consideration of ITAC recommendation

Due to the social and political conflicts at the end of 2019 and the effects of the COVID-19 pandemic in 2020, possibilities to implement ITAC`s recommendations were limited. However, progress was made in the following areas:

Solar market development: Access to household appliances is being promoted to further increase the benefits of the use of energy. Pilot experiences will contribute to identify a wider range of solar technology solutions with prospects of expanding the portfolio of supplier companies.

Rehabilitation of SI: Potentials for rehabilitation of electrification of SI has been assessed and knowledge exchange with the local solar supplier ENERGETICA and 5 rural municipalities in the Cochabamba Department is ongoing. EnDev will scale-up pilot SI rehabilitation experiences to schools and educational centers in the most vulnerable and remote regions.

Gender: A coherent gender strategy had been incorporated into EnDev's work to support reduction of inequality gaps between men and women in aspects of business, financial and capacity-building development (see also above). Additional measures to support women comprise: (i) Special support for women's access to funding through agreements and/or grants with financial institutions, donors and partners; (ii) Development of financial products together with Business Development Partners (BDP) with incentives for local companies and start-ups owned or led by women; (iii) Fundraising for professionalizing female electricians through BDP´s.

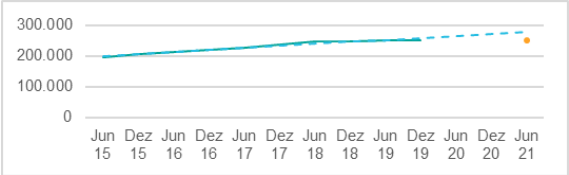
Quality of response to ITAC recommendations (on a scala from low-medium-high): **medium**

Section 3: Performance

Effectiveness

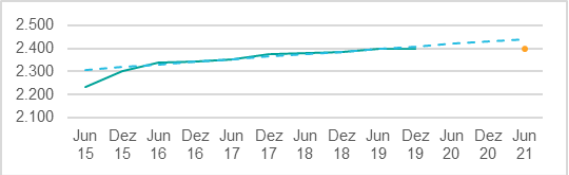
HH Access Cooking

Targets: 251,000 Achieved: 251,326



SI Access

Targets: 2,400 Achieved: 2,398

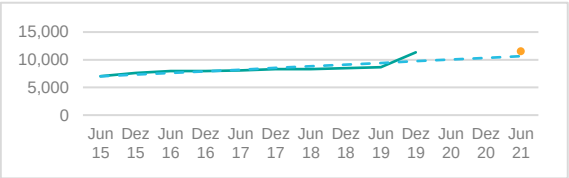


HH Access Electricity

Targets: 340,000 Achieved: 295,469

PU Access

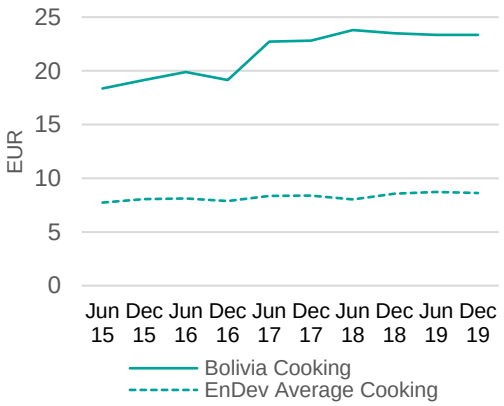
Targets: 15,000 Achieved: 11,337

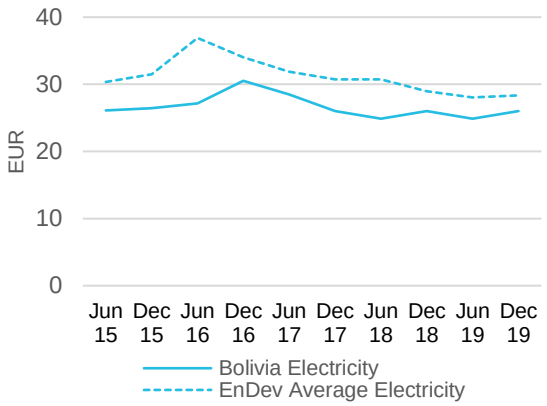


Additional info

- EnDev in Bolivia is significantly contributing to EnDev global overall **PU results** with more than 11,000 SMEs, farmers' organizations and communities having been provided with PUE technologies, voltage transformers as well as capacity building.
- Synergies between **electricity access (grid densification) and PU** access were systematically used and contribute to higher tier electrification and PUE among target groups.

Efficiency





Additional info

- After more than 10 years of promoting **improved cooking technologies** and taking the low cost-efficiency of this component into account, these **activities were outphased in 2018**; since 2019, EnDev Bolivia does not have a cooking component anymore; instead a **focus was laid on PUE and higher tier electricity access** which is primarily operationalized in cooperation with local agricultural and electricity cooperatives, utilities and women organizations.
- Good cost efficiency of **electrification activities** providing higher tier access by effectively combining electricity access for rural HH, productive use, supporting grid densification measures and efficient electricity usage and supply campaigns in cooperation with rural cooperatives.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

The analysis focuses mostly on the solar market of picoPVs, SHS and solar water pumps. **PicoPVs and SHS** are currently the best-selling and most affordable off-grid lighting alternatives, however, further support is necessary for the promotion of picoPV and SHS for the last mile. Solar water pumping has grown exponentially, showing high potential especially in isolated regions.

In the **solar sector**, EnDev supports private companies and start-ups in developing, diversifying and qualifying business modalities and distribution channels through training, providing key networks and partnerships for businesses. Given relatively small market sizes (especially the niche markets for off-grid, remote areas) it is important to support cooperation between market actors in order to realize cost reduction and increase efficiency. Reliable warranty schemes and after-sales services are necessary for further market development and are supported by EnDev. Likewise, EnDev promotes user awareness to stimulate the demand side and especially to increase willingness to pay and to diversify experiences on photovoltaic technologies among potential customers.

Regarding **on-grid and PUE**, EnDev supports local suppliers of electric material in meeting certified quality standards established in the national electricity law. EnDev has connected, organized and validated lists of PUE designers and suppliers nationwide, linking supply and demand (associations and cooperatives, women groups). An ongoing process with FASERTe aims at developing sustainable markets and supply channels for renewable energy technologies.

Implications of public unrest and COVID-19

Market development has been negatively impacted between late 2019 and mid-2020. Political and social unrest after failed October 2019 national elections slowed down the photovoltaic market. The COVID-19 pandemic stagnated or even reversed many positive trends in market development in variables such as number of businesses, business modalities, supply chain length and distribution channels, among others. Meanwhile, between 25% and 40% of jobs in the main suppliers of photovoltaic technologies have been lost so far and sales have dropped by nearly 80%. Thus, market stages for job creation, products/services sold, inventory turnover, satisfaction level and willingness to pay have already regressed. Strict and prolonged (150 days) quarantine measures have been implemented nationally and are also strongly impacting the economy. Suppliers with whom the EAMD was reviewed agreed that in a scenario without EnDev Bolivia support, it will take a minimum of 1 or even 2 years to expect some recovery.

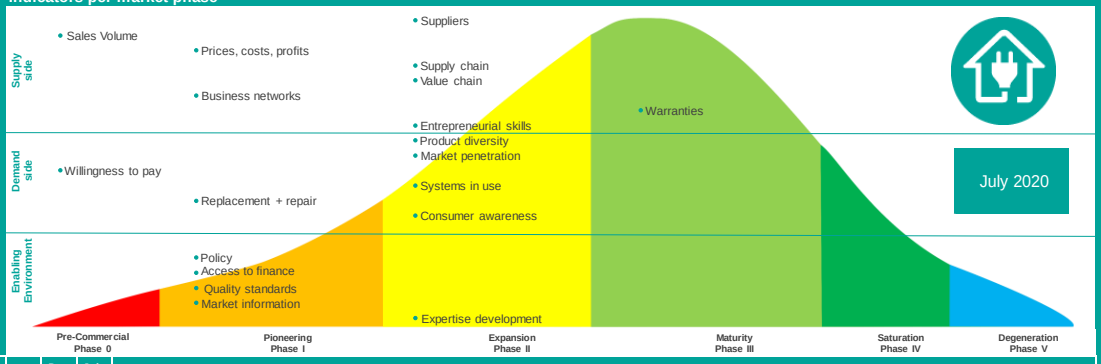
Summary EnDev Market Scorecard: Bolivia July 2020 Solar Products

Market: Pico PV. National market for these technologies is expanding, new smaller players are entering the market, and overall there are positive trends in most indicators, in spite of recent social and political unrest.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators	Variables		2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	↘	COVID reoriented many potential consumers' priorities and reduced their ability to purchase technologies. This changed the positive trend to a slightly negative one with final results yet to be seen. New businesses are still evaluating the markets.
	S1V2	Business modalities	↗	↗	↓	Business modalities consolidated after years of experiene have been seriously disrupted by the new context. Strategies and models need to be revisited and rethought.
	S1V3	Formality	→	↑	↘	Main market players still operate formally. However, State-led projects that acted as strong incentives for formalization (because of its potential for large sales) are no longer in place. The next months may show how private actors rearrange.
	S1V4	Jobs created	→	→	↘	Firms reported significant staff reduction. In order to reduce costs, firms fired between 25% and 40% of their payroll staff.
S2 Sales Volume	S2V1	Products / services sold	▽	↗	→	Firms reported very sharp sales drops ranging between 70% and 80%.
	S2V2	Inventory turnover	↗	↗	→	While previous economic slowdown reduced inventory turnover without significant deterioration, the pandemic has clearly reversed all positive trends.
S3 Prices, costs and profits	S3V1	Prices	↗	↗	→	Though prices have not yet changed, firms' efforts to regulate them according to their rural potential customers are stagnated. Focus is on surviving on a low-sales context.
	S3V2	Costs	↔	▯	▯	Private sector is not very willing to share information regarding actual/real costs of commercialized technologies. Therefore, it is difficult to asses the costs and their tendencies.
	S3V3	Profit margin	↗	▽	→	Private sector is not very willing to share information regarding their profit margins. Sensible information. However, general outlook seems quite bleak for profiting.
	S3V4	Investments	↗	→	→	While investmets slowed down but continued in 2019, the pandemic has halted investment possibiities in the first semester of 2020, as firms struggle to reduce costs and losses due to sharp sale drops.
S4 Supply chain and after-sales service	S4V1	Length	▽	→	↓	Supply and distribution chains previously developed have now a negative outlook. However, the actual extent of the impact is yet to be seen once firms can resume commercial activities in rural areas.
	S4V2	Distribution channels	▽	→	↘	If distribution channels needed local logistical subsidies in order to thrive, now businesses will have greater difficulties channeling these resources.
	S4V3	Spatial reach	▽	↗	↘	While spatial reach has reached a maturity phase, currently firms personnel and "non-esencial" products cannot travel freely across the country. Therefore, spatial reach is on standby until new developments.
	S4V4	Initial suppliers		↗	→	Though operations continue, this is done in a reduced manner. Firms want to satisfy demand, but demand has been hit by the pandemic context. Recovery is possible but will need to be assessed in the next months.
	S4V5	After-sales service	▽	↗	↘	Warranties and other after-sales services provided by formal businesses are still in place. However, it is now harder for rural customers in remote areas to access local maintenance services and for firms´s staff to travel.
S5 Value chain	S5V1	Value added	↗	→	↘	Reduced investment perspectives may have a negative outlook con value added through the indroduction of new products into the market.
S6 Business networks	S6V1	Networks	▽	↗	→	Though the support of the international cooperation continues, distribution networks in rural areas are temporarily halted due to traveling difficulty.
	S6V2	Partnerships	↑	↗	→	Cooperation agencies remain as important partners for private actors in the sector. However, small private ventures related to importing technologies face disincentives to invest and take risks while demand is stagnant.
S7 Warranties	S7V1	Warranties	▯	→	→	Warranties -both from the fatories and from national businesses- remain in place.
S8 Entrepreneurial skills	S8V1	Financial literacy	▯	→	→	Qualified personnel and business capabilities remain.
	S8V2	Satisfaction level	▯	↗	↗	The pandemic has created uncertainty on how the business may develop in the near future. Nevertheless, there is hope that the situation is only temporary and will improve in a few months.
	S8V3	Marketing skills	↗	↗	↗	Marketing skills developed in previous periods remain. Some refocus may be needed in order to adapt to increasing importance of internet for promoting the products.
	S8V4	Advertising	↗	↑	↗	Information and Communication Technologies are becoming increasingly important. In rural areas, traditional media (mainly radio) is also still strong. Challenges are related on how to convince potential customers in the current situation.
	S8V5	Production automatization	→	▪	▪	
	S8V6	Standardized production	▯	▪	▪	
D1 Product diversity	D1V1	Diversity	↑	↗	→	Diversification of Pico PVs may not go as originally envisioned by businesses, as investments are halted until the situation improves.
D2 Market penetration	D2V1	Market penetration	↗	→	→	No significant changes in market penetration so far.
D3 Willingness to pay	D3V1	Willingness to pay	↗	→	▽	Sharp drop in demand is also a reflection of a reduction of consumers' willingness to pay. As livelihoods are lost or are facing downturn, households have even less money available.
D4 Systems in use	D4V1	Usage rate	↑	↗	↗	No significant changes in usage rate so far.
	D4V2	Maintenance	↗	↗	↗	No significant changes in maintenance so far.
D5 Replacement and repair	D5V1	Replacement rate	▯	▯	▽	Travel dfficulty has added to previous ones, such as logistic and remoteness. Replacement is lower this semester.
	D5V2	Repair rate		↗	→	Travel dfficulty has added to previous ones, such as logistic and remoteness. Reparing has become considerably more difficult for now.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↑	No significant changes in user awareness so far.
	D6V2	Perception	↗	↗	↗	No perceivable changes in user perceptions so far.
E1 Policy	E1V1	National plans	▽	↗	▽	National plans regarding renewable energies and technologies have been halted. It is unknown exactly when and how they will resume.
	E1V2	Policy	▽	↗	▽	National policies regarding renewable energies and technologies are currently not a top priority. It is unknown exactly when and how they will resume.
	E1V3	Product taxes	▽	→	→	Pico PV kits are charged with relatively high tariffs and taxes. This increases the final sale prices paid by the final customer.
	E1V4	Business taxes	▽	▽	▽	A big part of Pico PV are imported informally, without warranties and of low quality. This acts against the credibility of the technologies. The large size of the informal sector can in this sense be a problem.
E2 Access to finance	E2V1	Subsidies	▽	→	→	No significant changes are visible so far.
	E2V2	Financing options suppliers	↗	→	→	No significant changes are visible so far.
	E2V3	Financing options consumers	↗	↗	→	Financial institutions may be willing to loan since some government policies for Covid releif may be aiming towards this. However, consumers are unlikely to borrow for "non-essential" purchases in the current situation.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	▽	↗	→	State-led projects and programs for implementing Pico PVs are mostly halted, thus, there is no longer a requirement to abide to these.
	E3V2	Enforcement	▯	↗	→	Enforcement, previously related to State-led projects, is not taking place in the same way now.
E4 Market information	E4V1	Cost of information	▯	↗	↗	No significant changes are visible so far.
	E4V2	Market facilitation organizations	▯	▯	▯	No significant changes are visible so far.
	E4V3	Awareness campaigns	↗	↗	▽	Government has not supported awareness campaings directed towards potential consumers. The pandemic situation makes this even less of a priority.
E5 Expertise development	E5V1	Courses	↗	↗	→	Virtual courses (webinars, etc.) have increased during the pandemic. However, rural areas with poor or no access to internet are greatly excluded from this new trend.
	E5V2	BDT	↗	↗	→	Virtual courses (webinars, etc.) have increased during the pandemic. However, BDTs need to be re-focused and re-designed to fit the current situation and constraints.
	E5V3	User training	↗	↗	→	User trainings need to be face-to-face as they are highy practical. Poor or lack of internet in rural areas makes it difficult to explore other alternatives in the pandemic context.

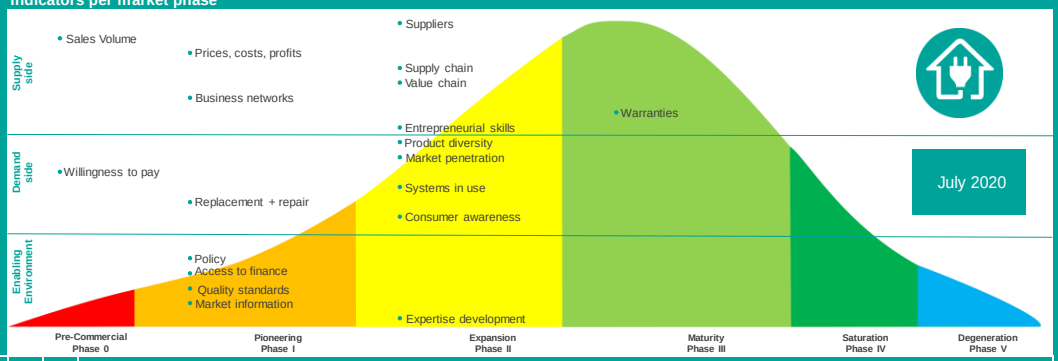
Summary EnDev Market Scorecard: Bolivia July 2020 Solar Home Systems

Market: Solar Home Systems - SHS. National market shows slight expansion. Pioneer enterprises continue dominating the market, but new smaller ventures are also becoming important actors. Although some indicators seem to have stagnated, there is high potential for further growth at national level.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↘	COVID reoriented many potential consumers' priorities and reduced their ability to purchase technologies. This changed the positive trend to a slightly negative one with final results yet to be seen. New businesses are still evaluating the markets.
	S1V2	Business modalities	↗	↓	Business modalities consolidated after years of experiene have been seriously disrupted by the new context. Strategies and models need to be revisited and rethought.
	S1V3	Formality	↑	↘	Main market players still operate formally. However, State-led projects that acted as strong incentives for formalization (because of its potential for large sales) are no longer in place. The next months may show how private actors rearrange.
	S1V4	Jobs created	→	↘	Firms reported significant staff reduction. In order to reduce costs, firms fired between 25% and 40% of their payroll staff.
S2 Sales Volume	S2V1	Products / services sold	↗	→	Firms reported very sharp sales drops ranging between 70% and 80%.
	S2V2	Inventory turnover	↗	→	While previous economic slowdown reduced inventory turnover without significant deterioration, the pandemic has clearly reversed all positive trends.
S3 Prices, costs and profits	S3V1	Prices	↗	→	Though prices have not yet changed, firms' efforts to regulate them according to their rural potential customers are stagnated. Focus is on surviving on a low-sales context.
	S3V2	Costs	▯	▯	Private sector is not very willing to share information regarding actual/real costs of commercialized technologies. Therefore, it is difficult to asses the costs and their tendencies.
	S3V3	Profit margin	▽	→	Private sector is not very willing to share information regarding their profit margins. Sensible information. However, general outlook seems quite bleak for profiting.
	S3V4	Investments	→	→	While investmets slowed down but continued in 2019, the pandemic has halted investment possibiities in the first semester of 2020, as firms strugge to reduce costs and losses due to sharp sale drops.
S4 Supply chain and after-sales service	S4V1	Length	→	↓	Supply and distribution chains previously developed have now a negative outlook. However, the actual extent of the impact is yet to be seen once firms can resume commercial activities in rural areas.
	S4V2	Distribution channels	→	↘	If distribution channels needed local logistical subsidies in order to thrive, now businesses will have greater difficulties channeling these resources.
	S4V3	Spatial reach	↗	↘	While spatial reach has reached a maturity phase, currently firms personnel and "non-esencial" products cannot travel freely across the country. Therefore, spatial reach is on standby until new developments.
	S4V4	Initial suppliers	↗	→	Though operations continue, this is done in a reduced manner. Firms want to satisfy demand, but demand has been hit by the pandemic context. Recovery is possible but will need to be assessed in the next months.
	S4V5	After-sales service	↗	↘	Warranties and other after-sales services provided by formal businesses are still in place. However, it is now harder for rural customers in remote areas to access local maintenance services and for firms´s staff to travel.
S5 Value chain	S5V1	Value added	↗	↘	Reduced investment perspectives may have a negative outlook for value added through the indroduction of new products into the market.
S6 Business networks	S6V1	Networks	↗	→	Though the support of the international cooperation continues, distribution networks in rural areas are temporarily halted due to traveling difficulty.
	S6V2	Partnerships	↗	→	Cooperation agencies remain as important partners for private actors in the sector. However, small private ventures related to importing technologies face disincentives to invest and to take risks while demand is stagnant.
S7 Warranties	S7V1	Warranties	→	→	Warranties -both from the factories and from national businesses- remain in place.
S8 Entrepreneurial skills	S8V1	Financial literacy	→	→	Qualified personnel and business capabilities remain.
	S8V2	Satisfaction level	↗	↗	The pandemic has created uncertainty on how the business may develop in the near future. Nevertheless, there is hope that the situation is only temporary and will improve in a few months.
	S8V3	Marketing skills	↗	↗	Marketing skills developed in previous periods remain. Some refocus may be needed in order to adapt to increasing importance of internet for promoting the products.
	S8V4	Advertising	↑	↗	Information and Communication Technologies are becoming increasingly important. In rural areas, traditional media (mainly radio) is also still strong. Challenges are related on how to convince potential customers in the current situation.
	S8V5	Production automatization	▪	▪	Variable does not apply to this technology market
	S8V6	Standardized production	▪	▪	Variable does not apply to this technology market
D1 Product diversity	D1V1	Diversity	↗	→	Diversification of SHS may not go as originally envisioned by businesses, as investments are halted until the situation improves.
D2 Market penetration	D2V1	Market penetration	→	→	No significant changes in market penetration so far.
D3 Willingness to pay	D3V1	Willingness to pay	→	▽	Sharp drop in demand is also a reflection of a reduction of consumers' willingness to pay. As livelihoods are lost or are facing downturn, households have even less money available.
D4 Systems in use	D4V1	Usage rate	↗	↗	No significant changes in usage rate so far.
	D4V2	Maintenance	↗	↗	No significant changes in maintenance so far.
D5 Replacement and repair	D5V1	Replacement rate	▯	▽	Travel dfficulty has added to previous ones, such as logistic and remoteness. Replacement is lower this semester.
	D5V2	Repair rate	↗	→	Travel dfficulty has added to previous ones, such as logistic and remoteness. Reparing has become considerably more difficult for now.
D6 Consumer awareness and perception	D6V1	Awareness	↑	↑	No significant changes in user awareness so far.
	D6V2	Perception	↗	↗	No perceivable changes in user perceptions so far.
E1 Policy	E1V1	National plans	↗	▽	National plans regarding renewable energies and technologies have been halted. It is unknown exactly when and how they will resume.
	E1V2	Policy	↗	▽	National policies regarding renewable energies and technologies are currently not a top priority. It is unknown exactly when and how they will resume.
	E1V3	Product taxes	→	→	SHS are charged with relatively high tariffs and taxes. Although some large solar panels enjoy less tariffs and custom fees, the rest of the equipmet does not. This increases the final sale prices paid by the final customer.
	E1V4	Business taxes	▽	▽	Firms consider business taxes to be relatively fair. However, informal ventures evade taxes and do not provide the market with quality or warrantied products.
E2 Access to finance	E2V1	Subsidies	→	→	No significant changes are visible so far.
	E2V2	Financing options suppliers	→	→	No significant changes are visible so far.
	E2V3	Financing options consumers	↗	→	Financial institutions may be willing to loan since some government policies for Covid releif may be aiming towards this. However, consumers are unlikely to borrow for "non-essential" purchases in the current situation.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	State-led projects and programs for implementing SHS are mostly halted, thus, there is no longer a requirement to abide to these.
	E3V2	Enforcement	↗	→	Enforcement, previously related to State-led projects, is not taking place in the same way now.
E4 Market information	E4V1	Cost of information	↗	↗	No significant changes are visible so far.
	E4V2	Market facilitation organizations	▯	▯	No significant changes are visible so far.
	E4V3	Awareness campaigns	↗	▽	Government has not supported awareness campaings directed towards potential consumers. The pandemic situation makes this even less of a priority.
E5 Expertise development	E5V1	Courses	↗	→	Virtual courses (webinars, etc.) have increased during the pandemic. However, rural areas with poor or no access to internet are greatly excluded from this new trend.
	E5V2	BDT	↗	→	Virtual courses (webinars, etc.) have increased during the pandemic. However, BDTs need to be re-focused and re-designed to fit the current situation and constraints.
	E5V3	User training	↗	→	User trainings need to be face-to-face as they are highy practical. Poor or lack of internet in rural areas makes it difficult to explore other alternatives in the pandemic context.

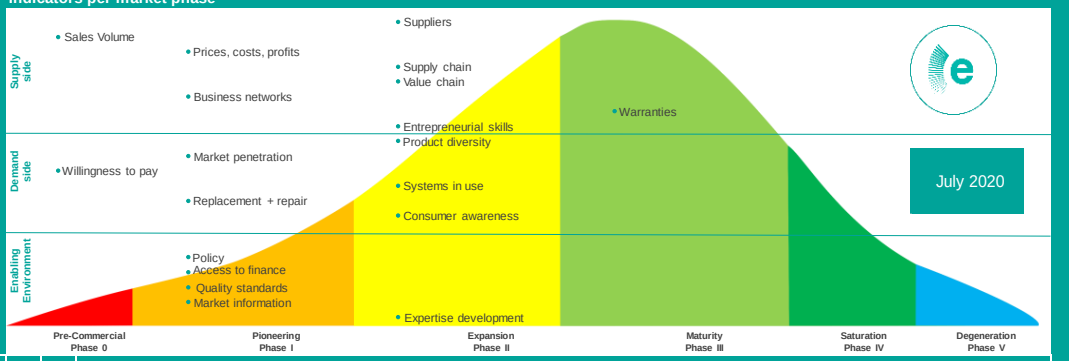
Summary EnDev Market Scorecard: Bolivia July 2020 Other: Solar Water Pumps

Market: Solar water Pumps. Medium and large marketers of SHS, PicoPV and solar pumps are mainly the same ones: the solar market is basically one in the whole country. Solar pumps, however, are relatively new in Bolivia. This market is showig greater expansion potential, as producers can associate in order to purchase pumps, making them more affordable. Farmers will probably continue demanding this technology because it enables production and income generation.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators	Variables		Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↘	COVID reoriented many potential consumers' priorities and reduced their ability to purchase technologies. This changed the positive trend to a slightly negative one with final results yet to be seen. New businesses are still evaluating the markets.
	S1V2	Business modalities	↗	↓	Business modalities consolidated after years of experiene have been seriously disrupted by the new context. Strategies and models need to be revisited and rethought.
	S1V3	Formality	↑	↘	Main market players still operate formally. However, State-led projects that acted as strong incentives for formalization (because of its potential for large sales) are no longer in place. The next months may show how private actors rearrange.
	S1V4	Jobs created	→	↘	Firms reported significant staff reduction. In order to reduce costs, firms fired between 25% and 40% of their payroll staff.
S2 Sales Volume	S2V1	Products / services sold	↗	→	Firms reported very sharp sales drops ranging between 70% and 80%.
	S2V2	Inventory turnover	↗	→	While previous economic slowdown reduced inventory turnover without significant deterioration, the pandemic has clearly reversed all positive trends.
S3 Prices, costs and profits	S3V1	Prices	↗	→	Though prices have not yet changed, firms' efforts to regulate them according to their rural potential customers are stagnated. Focus is on surviving on a low-sales context.
	S3V2	Costs	▯	▯	Private sector is not very willing to share information regarding actual/real costs of commercialized technologies. Therefore, it is difficult to asses the costs and their tendencies.
	S3V3	Profit margin	▽	→	Private sector is not very willing to share information regarding their profit margins. Sensible information. However, general outlook seems quite bleak for profiting.
	S3V4	Investments	→	→	While investmets slowed down but continued in 2019, the pandemic has halted investment possibilities in the first semester of 2020, as firms strugge to reduce costs and losses due to sharp sale drops.
S4 Supply chain and after-sales service	S4V1	Length	→	↓	Supply and distribution chains previously developed have now a negative outlook. However, the actual extent of the impact is yet to be seen once firms can resume commercial activities in rural areas.
	S4V2	Distribution channels	→	↘	If distribution channels needed local logistical subsidies in order to thrive, now businesses will have greater difficulties channeling these resources.
	S4V3	Spatial reach	↗	↘	Spatial reach was expanding, but currently firms personnel and "non-esencial" products cannot travel freely across the country. Therefore, spatial reach is on standby until new developments.
	S4V4	Initial suppliers	↗	→	Though operations continue, this is done in a reduced manner. Firms want to satisfy demand, but demand has been hit by the pandemic context. Recovery is possible but will need to be assessed in the next months.
	S4V5	After-sales service	↗	↘	Warranties and other after-sales services provided by formal businesses are still in place. However, it is now harder for rural customers in remote areas to access local maintenance services and for firms´s staff to travel.
S5 Value chain	S5V1	Value added	↗	→	Reduced investment perspectives may have a negative outlook con value added through the indroduction of new products into the market.
S6 Business networks	S6V1	Networks	↗	→	Though the support of the international cooperation continues, distribution networks in rural areas are temporarily halted due to traveling difficulty.
	S6V2	Partnerships	↗	→	Cooperation agencies remain as important partners for private actors in the sector. However, small private ventures that import technologies face disincentives to invest and take risks while demand is stagnant.
S7 Warranties	S7V1	Warranties	→	→	Warranties -both from the fatories and from national businesses- remain in place.
S8 Entrepreneurial skills	S8V1	Financial literacy	→	→	Qualified personnel and business capabilities remain.
	S8V2	Satisfaction level	↗	↗	The pandemic has created uncertainty on how the business may develop in the near future. Nevertheless, there is hope that the situation is only temporary and will improve in a few months.
	S8V3	Marketing skills	↗	↗	Marketing skills developed in previous periods remain. Some refocus may be needed in order to adapt to increasing importance of internet for promoting the products.
	S8V4	Advertising	↑	↗	Information and Communication Technologies are becoming increasingly important. In rural areas, traditional media (mainly radio) is also still strong. Challenges are related on how to convince potential customers in the current situation. Invoking the bennefits of improving production may be a way.
	S8V5	Production automatization	▪	▪	Variable does not apply to this technology market
	S8V6	Standardized production	▪	▪	Variable does not apply to this technology market
D1 Product diversity	D1V1	Diversity	↗	→	Solar pumping in itself constitutes a diversification of the solar portfolio. However, the pandemic is hindering further expansion in 2020.
D2 Market penetration	D2V1	Market penetration	↗	→	Market penetration is stagnant due to the pandemic.
D3 Willingness to pay	D3V1	Willingness to pay	▯	▽	Sharp drop in demand is also a reflection of a reduction of consumers' willingness to pay. As livelihoods are lost or are facing downturn, households have even less money available. Productive use of the technology may help maintain sales once traveling becomes easier. Trends and changes remain to be seen.
D4 Systems in use	D4V1	Usage rate	↗	↗	No significant changes in usage rate so far.
	D4V2	Maintenance	↗	↗	No significant changes in maintenance so far.
D5 Replacement and repair	D5V1	Replacement rate	▯	▽	Travel dfficulty has added to previous ones, such as logistic and remoteness. Also, solar pumps are relatively new, so it is difficult to asses replacement rate at this point.
	D5V2	Repair rate	▽	→	Travel dfficulty has added to previous ones, such as logistic and remoteness. Reparing has become considerably more difficult for now. Also, solar pumps are relatively new, so it is difficult to asses repair rates at this point.
D6 Consumer awareness and perception	D6V1	Awareness	↑	↑	No significant changes in user awareness so far.
	D6V2	Perception	↗	↗	No perceivable changes in user perceptions so far.
E1 Policy	E1V1	National plans	↗	▽	National plans regarding renewable energies and technologies have been halted. It is unknown exactly when and how they will resume.
	E1V2	Policy	↗	▽	National policies regarding renewable energies and technologies are currently not a priority. It is unknown exactly when and how they will resume.
	E1V3	Product taxes	→	→	No significant changes are visible so far.
	E1V4	Business taxes	▽	▽	No significant changes are visible so far.
E2 Access to finance	E2V1	Subsidies	→	→	No significant changes are visible so far.
	E2V2	Financing options suppliers	→	▽	Government has anounced loans for small and medium enterprises. However, conditions are not quite clear at this point.
	E2V3	Financing options consumers	↗	→	Financial institutions may be willing to loan since some government policies for Covid releif may be aiming towards this. However, consumers are unlikely to borrow for "non-essential" purchases in the current situation.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	State-led projects and programs for implementing solar pumps are mostly halted, thus, there is no longer a requirement to abide to these.
	E3V2	Enforcement	↗	→	Enforcement, previously related to State-led projects, is not taking place in the same way now.
E4 Market information	E4V1	Cost of information	↗	↗	No significant changes are visible so far.
	E4V2	Market facilitation organizations	▯	▯	No significant changes are visible so far.
	E4V3	Awareness campaigns	↗	▽	Government has not supported awareness campaings directed towards potential consumers. The pandemic situation makes this even less of a priority.
E5 Expertise development	E5V1	Courses	↗	→	Virtual courses (webinars, etc.) have increased during the pandemic. However, rural areas with poor or no access to internet are greatly excluded from this new trend.
	E5V2	BDT	↗	→	Virtual courses (webinars, etc.) have increased during the pandemic. However, BDTs need to be re-focused and re-designed to fit the current situation and constraints.
	E5V3	User training	↗	→	User trainings need to be face-to-face as they are highy practical. Poor or lack of internet in rural areas makes it difficult to explore other alternatives in the pandemic context.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Promote development of norms that improve the **business environment** for companies. • Contribute to developing **public sectoral programs** to expand PUE technologies (e.g. in cooperation with the Ministry for the Productive Development of the Country which supports the provision of equipment for PUE but without any accompanying measures on proper use and maintainance). • Linking stakeholders (consumer, supplier, banks, government etc.) to work on improved **framework conditions for access to financing**.
Supply side	• Promote incorporation of **incentives for the last mile.** • Advise to banks with regard to **adapted financial products** for modern energy solutions, e.g. support to an alliance with the Productive Development Bank (BDP) to develop green financial products at development rates. • Support to a **business coaching** program for companies and start-ups in cooperation with FASERTe. • Cooperation with the ongoing recycling projects “Markets4Recycling” and “ECOvecindarios”, implemented by the NGO Swisscontact and funded by the Swiss Development Cooperation (SDC), for the development of an **electric waste collection system in rural areas** and its possible integration in circular economy markets.
Demand side	• Promotion of PUE technologies through **thematic fairs, digital media and radio emissions** targeting individual producers and associatons/cooperatives. • **Awareness raising in households** for efficient energy use in high consumption areas. • Promoting of the market for **household appliances** to improve the use and benefits of the provided access to electricity. • Facilitating energy access to **vulnerable households** (native/indigenous/campesino people and isolated communities affected by COVID-19). • Development of **financial products to increase affordability** for households and SMEs together with the financial sector.
Other	• EnDev in Bolivia is the last active country project of EnDev in Latin America and thereby ensures the **global character** of the overall program; in addition, EnDev in Bolivia is one of the main contributors to EnDev’s global **PUE targets**.

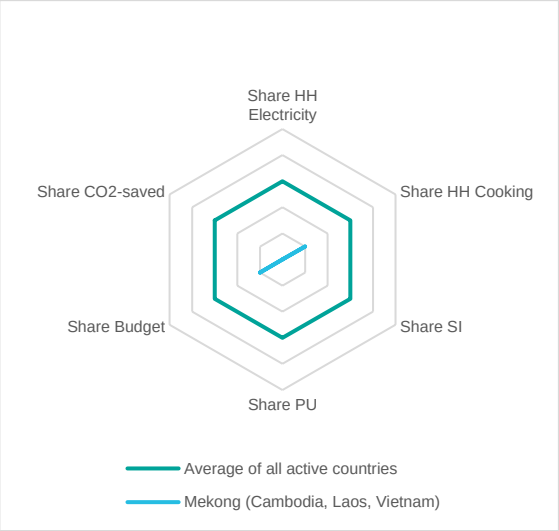
Cambodia (with activities in Laos)

Section 1: Key facts

Country facts	
Population	16.3 million
HDI	146 ↓ | Total (0.59)
UN Classification	LDC
Access clean cooking	65 % (urban) 10 % (rural)
Access electricity	100 % (urban) 89 % (rural)

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
Implementer	SNV
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• Project demonstrates market development potential of novel type of industrially produced **higher-tier (Tier 2-4) biomass cookstove**; in parallel integrates increasingly more advanced stove models in traditional ICS supply chain; and starts to explore electric cooking potential. • Project contributes to EnDev's strategic ambition for progress towards **higher-tier access in cooking;** fosters investment readiness & scaling of (semi-)industrial cookstove market actors. • High relevance with regard to already realized groundwork for developing a **local higher-tier cooking industry** and resulting scale-up potential to build on towards 2030.
Contribution to paradigm shift	• Project triggered **market entry of international stove manufacturers** and created initial market for a novel type of higher-tier (Tier 2-4) biomass stove; now supports maturing and scaling of the still nascent higher-tier ICS industry. • Focus on **rapid sector transformation**: significant momentum already created for self-propelling, exponential growth of the higher-tier ICS market through increasing professionalization of market actors (industrial producers, newly set-up local production facilities); and highly successful mass-media communication campaign triggering awareness and demand. • Established lower-tier ICS market structures are used to introduce gradually higher-tier models and **electric cooking** solutions.
Important collaborations for scaling up	• Project collaborates with UKAID's global program "Modern Energy Cooking Services" (**MECS**) for exploration of electric cooking. • Project pursues "bottom-up" market scaling approach for ICS by working at **community/grassroots level** through formal collaboration with the 'Commune Committees for Women and Children' of the Cambodia Ministry of Interior. • Building on successful Behaviour Change Communication/Household Dialogue approach in WASH sector, EnDev project collaborates with **USAID-funded Sanitation Program** to implement "smoke-free village" cookstove approach. • Alignment/complimentary activities with **Nordic Climate Fund** (NCF; invests in fuel pellet production and stove production facility of stove producer).
Gender	• A **gender analysis** has not been specifically conducted for the EnDev project, however secondary data sources exist that are relevant for the project and are taken into account for the design of the project's activities.

Consideration of ITAC recommendation

Project ambition: Main ambition of the Cambodia country component is for the time being the preparation of a higher-tier ICS market with quality products and successful and professional market actors. Innovative approaches - such as support to e-business, social media-based awareness campaigns and community based dialogue approaches - are applied to overcome initial market growth barriers. Only after this initial phase the project ambition can shift to contribute significantly to EnDev's global outcome targets.

Access to commercial finance/ Investments for market scale-up: Access to capital is a central condition for scaling of ICS markets. EnDev already catalysed private equity and donor funding outside of EnDev worth 0.5 million Euro; a new ADB 0.5 million Euro opportunity is actively pursued. Stove producers are now also at a stage of professionalisation to attract debt/equity investments for scaling. Consumer financing models are provided by the stove producers through sales on credit.

Reigniting government focus: Given a limited interest of the Ministry of Energy in cooking energy on the national level, the project is taking a deliberate "bottom-up" approach by working through the grassroots 'Commune Committees for Women and Children' network under the Ministry of Interior that understands the challenges on the village level very well and is keen to cooperate.

Cross-national exchange: Over the past years EnDev supported the exchange of cookstove models in the Mekong region. The so called RENMI intervention stove from Laos has its origins in the 3G intervention stove from Vietnam, and also the Khmer Eco derives its design from it. After an exchange of Cambodian ceramic cookstove producers with their peers in Laos organized by EnDev, the WS3 stove model from Laos is now successfully introduced to the conventional ICS market in Cambodia.

Gender: The project actively builds on women's pivotal role in energy production, distribution and utilization. Likewise, the project puts particular focus on growing women's businesses and leadership and on engagement of women in demand activation through Behavioural Change Communication (BCC) and household dialogue approaches.

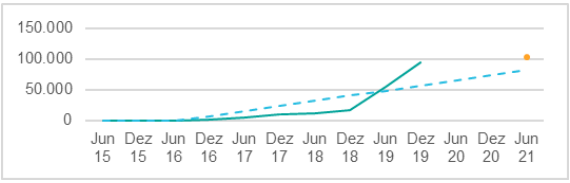
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

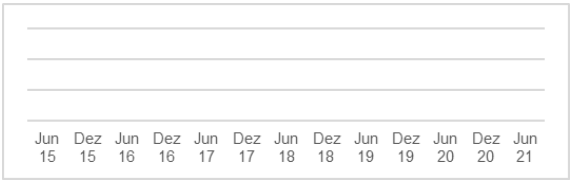
HH Access Cooking

Targets: 103,000 Achieved: 94,973



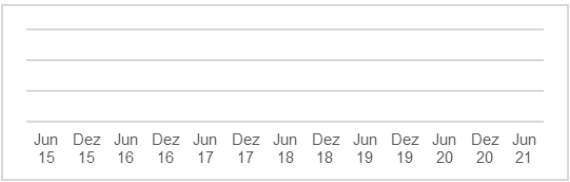
SI Access

Targets: 0.0 Achieved: 0.0



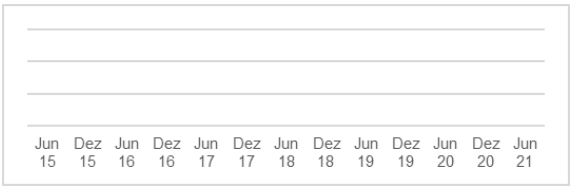
HH Access Electricity

Targets: 0.0 Achieved: 0.0



PU Access

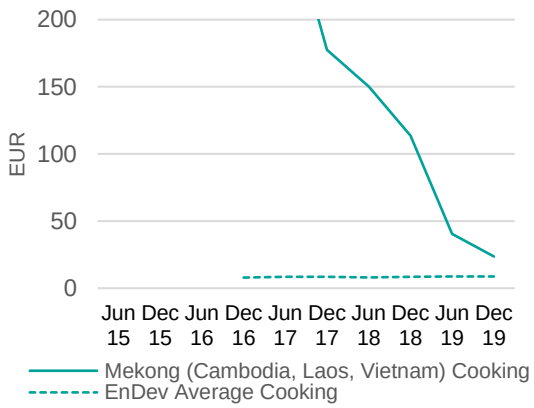
Targets: 0.0 Achieved: 0.0

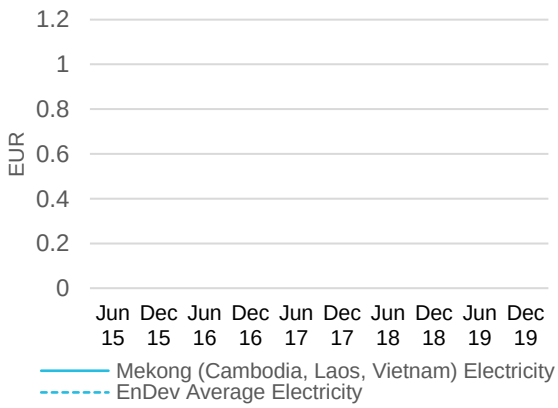


Additional info

- Sharp increase in outcome results for **HH access cooking** is mainly due to dynamic market development in Laos (graph includes results from Cambodia and Laos). Contribution of outcome results of the country component Cambodia with its focus on the higher tier cookstoves industry is still limited due to the nascent market development stage of this industry.
- It is expected that with producers and supply chains stepping from introductory phase to market readiness, **sales will pick up in 2021** (conditional to the effects of COVID-19).
- The **new stove model introduced from Laos** to Cambodia in the conventional ICS market was market-tested positively and will also contribute in the future to increases in sales, and so might future electric cooking sales.

Efficiency





Additional info

- **Cooking efficiency** of the project started improving for a first time over the course of 2018 - during the first project phase - when increasingly less RBF funds were required for the market to function, as stoves started trading at sustainable commercial prices, and larger volumes started to be traded, and RBF was ultimately phased out.
- Cost-efficiency then started improving significantly for a second time beginning of the current project phase in 2019. This is, however, mostly due to significant **outcome target increases in Laos.**
- Likely continuing this sharp **trend towards improved cost-efficiency**, the project will dive under EnDev's average access cost benchmarks per person by the end of the current phase, despite the higher-tier access provided through the project.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Cooking Sector

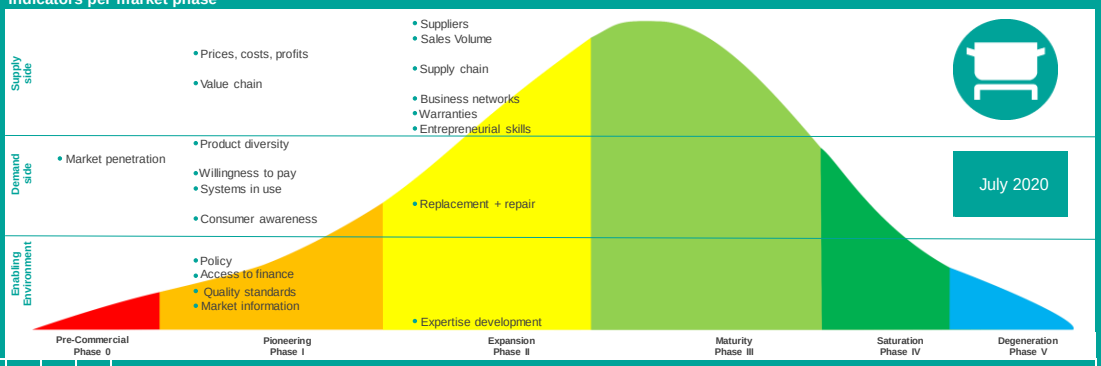
The previous EnDev project phase laid the ground of a local industry for **higher-tier biomass cookstoves** that was still inexistent before start of the project, with customer acceptance and sustainable pricing now proven for this novel technology. Likewise, commercially viable business models were established, and significant private sector investments and jobs created along the value chain for a technology that is still emerging globally. Previously imported advanced ICS technology is now produced locally, driving scale, choice, awareness and contributing to reduced costs. Maturing of the industry is still needed and needs time, but gradual progress is already visible (also cf. EAMD Scorecard 2018 vs. 2020) The young industry for high-tier stoves is still in the early stages and has continued need for being build up with pointed and targeted support to resolve market challenges to scale. Full market maturity is expected to require several years more of commitments, while building up scale steadily towards 2030.

The market assessment/scorecard exercise done among the key stakeholders in the cooking sector reveals a general positive market development, with higher tier cookstoves largely in the pioneering phase, indicating that it is still an ongoing market development process. An increase of suppliers is mainly due to new conventional ceramic cookstove producers adopting the cookstove model from EnDev Laos whereas the higher-tier industrial producers remained the same. Initiatives are under way to add clean cookstove models to the ceramic stoves industry to widen the supply base. Governmental support for the emerging sector has been limited to one-off measures like tax exemptions for an individual stove producer (ACE). Supportive policies are yet not in place or idle. By cooperating with more receptive public organizations at local level market development can be supported. **COVID-19** has posed severe constraints to the demand because of economic insecurities and impacted a still fragile market to almost standstill.

Summary EnDev Market Scorecard: Cambodia July 2020 Improved cookstoves

Market: Our market is rural and peri-urban (countrywide). The households are still using biomass (wood) as primary cooking fuel.

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	-

Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↑	↑	Growing number of producers taking part only in Tier 2 stove production.
	S1V2	Business modalities	↗	↗	↗	Owners working full time and employ others.
	S1V3	Formality	↗	→	→	Artisan stove producers run family business. Formality will be according to regulation. All metal stove producers are formally incorporated under govt registration.
	S1V4	Jobs created	↗	↑	↑	increase in number of employees (production and sale) though COVID-19 affected seriously in March-May 2020.
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↗	After COVID-19 (March-May 2020 sale was also zero), sales start to pick-up slowly in June 2020, the trend is positive.
	S2V2	Inventory turnover	↗	↑	↑	COVID-19 has delayed the production and inventory. From June 2020, the situation is improved.
S3 Prices, costs and profits	S3V1	Prices	↗	→	→	Ceramic stove price is in competition while price of big/metal product will be stagnant.
	S3V2	Costs	↗	↗	→	Though COVID-19 delayed the set-up local factory/production. Tier 3 stove cost still high compared to WTP.
	S3V3	Profit margin	↗	↗	→	all producers operate business with low margin. COVID-19 impacts negatively on producers.
	S3V4	Investments	↗	↗	↗	Producers are able to attract investment and atract donor investments. Traditional producers lack the capacity and initiative to do so.
S4 Supply chain and after-sales service	S4V1	Length	↗	→	↑	Artisan producers have other actors to play a role in value chain. Modern producers operate in a short supply chain.
	S4V2	Distribution channels	↗	↑	→	COVID-19 has certainly slowed down the distribution network building process.
	S4V3	Spatial reach	↗	↑	→	Sale is throughout the country through E-commerce and by direct face to face sales.
	S4V4	Initial suppliers	↗	↗	→	Many suppliers available locally and neighboring countries
	S4V5	After-sales service	↗	↑	↑	After-sales available for user provided by big producers. This is not applied for ceramic stoves.
S5 Value chain	S5V1	Value added	↗	↑	↗	Local sourcing is increasing local value.
S6 Business networks	S6V1	Networks	→	↗	↑	Traditional ICS associaiton is being strengthened in capacity to be able to have a more active role in sector coordination.
	S6V2	Partnerships	↗	↑	↗	
S7 Warranties	S7V1	Warranties	→	↗	→	Modern stove made by advanced technology come with a warranty. The warranty policy is well implemented.
S8 Entrepreneurial skills	S8V1	Financial literacy	→	↑	↗	Producers know the market well though not all of them have a business plan in place.
	S8V2	Satisfaction level	↗	↑	↗	COVID-19 brought severe challenges to the producers. In June and July 2020, E-commerce has given more optimistic prospect since EnDev supports Facebook campaigns.
	S8V3	Marketing skills	→	↑	↑	Marketing skills transferred by EnDev through coaching and training.
	S8V4	Advertising	↗	↑	↑	Business is willing to invest more in advertising.
	S8V5	Production automatization	→	↑	↗	Division of labors and semi-automation is happening with big producers. Artisan producers are applied some labor division in production process.
	S8V6	Standardized production	↗	↗	↑	Modern producers have products and production standards. Traditional producers have to compliance to association quality assurance.
D1 Product diversity	D1V1	Diversity	↗	↑	↑	more products introduced to market (KhmerEco and WS3)
D2 Market penetration	D2V1	Market penetration	↗	↑	↑	Optimistic in market penetration because of product diversity, new suppliers, and increase of business skills
D3 Willingness to pay	D3V1	Willingness to pay	↗	↑	↑	Affordable products are in process of market entry
D4 Systems in use	D4V1	Usage rate	↗	↑	↗	many efforts are put in place to increase usage rate such as user training, addressing user barriers, marketig, and community BCC.
	D4V2	Maintenance	↗	↗	↗	User training is part of sale process
D5 Replacement and repair	D5V1	Replacement rate	▯	↑	↑	replacement rate is high for any broken product.
	D5V2	Repair rate	↗	↑	↑	training is provided for sale agent to provide repairing service for their community
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↑	marketing and BCC are being implemented
	D6V2	Perception	↗	↑	↑	increase in referral
E1 Policy	E1V1	National plans	→	→	→	
	E1V2	Policy	→	→	→	
	E1V3	Product taxes	→	↗	→	VAT exemption is available for cookstove companies but only one was successful.
	E1V4	Business taxes	↗	↗	↑	Government of Cambodia is re-inforcing tax regime
E2 Access to finance	E2V1	Subsidies	→	→	↗	business is still fragile. Subsidy from donor for suppliers.
	E2V2	Financing options suppliers	↗	→	→	Limited or no financing options available in Cambodia.
	E2V3	Financing options consumers	↗	→	→	Financial institutions are not offering any products for renewable products. Businesses find other options for user credit like inhouse financing.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	→	→	→	national standard were drafted but yet seen any progress in adoption
	E3V2	Enforcement	→	→	→	no relevant regulation
E4 Market information	E4V1	Cost of information	→	↗	↗	e-commerce and BCC are playing role in market info
	E4V2	Market facilitation organizations	→	↗	→	There is no platform provided by public or private actors.
	E4V3	Awareness campaigns	→	↑	↑	Awareness raising is being done by donor, local government at community level is active and participated in BCC campaign.
E5 Expertise development	E5V1	Courses	↗	↑	→	Training is provided by companies and donors.
	E5V2	BDT	↗	↗	↑	Availability of business trainings and coaching is limited. Donors offered some services.
	E5V3	User training	→	↗	↑	EnDev made business understand of user training.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Potential to strengthen the cooking sector through **improved institutional embedding and mainstreaming** of clean cooking issues in health- and outreach channels of government and NGO partners. • Mainstreaming of clean cooking in the initiatives of the **National Behaviour Change Working Group**, aligning with USAID, Ministry of Natural Resources, Ministry of Forestry. • Reinforced cooperation with and strengthening of the '**Cambodian Efficient Stove Promotion Association** (CESPA) that oversees network of conventional ICS producers and retailers. • Linking **COVID-19 health resilience measures** to clean cooking/smoke exposure agenda to demonstrate that modern cooking solutions and behavior change communication in rural communities is a contribution to increase resilience.
Supply side	• The strong focus on the cookstove technology itself currently leaves a **skill gap** (i.e. in market savviness, business models, sales skills, etc.) among the private sector cookstoves actors. EnDev is well positioned to help to overcome this bottleneck to market growth. • **Sales training and coaching** currently already taking place will remain an important project activity for sector transition. • EnDev Mekong's in-depth experience in researching and developing new cookstove models (in cooperation with local partners like the Cambodian Institute of Technology and the independent Cookstove Lab) helps to accommodate a wide **variety of local preferences and cooking needs** necessary for further comprehensive market development. • Next to promotion of higher-tier ICS there is potential for increased **sales in the conventional, lower tier ICS market** as still large parts of the population (approx. 30%) continues cooking on three-stone fires (see recent ESMAP Multi-Tier Energy Access Assessment).
Demand side	• **Awareness campaigns and societal discourse** about dangers of inefficient, unhealthy biomass cooking in cooperation with e.g. the 'Commune Committees for Women and Children' should be replicated and scaled to contribute to increased demand for ICS. • High potential of increased demand through technical/financial support to stove distributors to scale **digital marketing** and growth of Facebook-based e-commerce sales models. • Needed working capital and infrastructure to **scale PAYGO and purchase-credits modalities** as successful approaches to overcome limited access to consumer finance can be facilitated by EnDev.

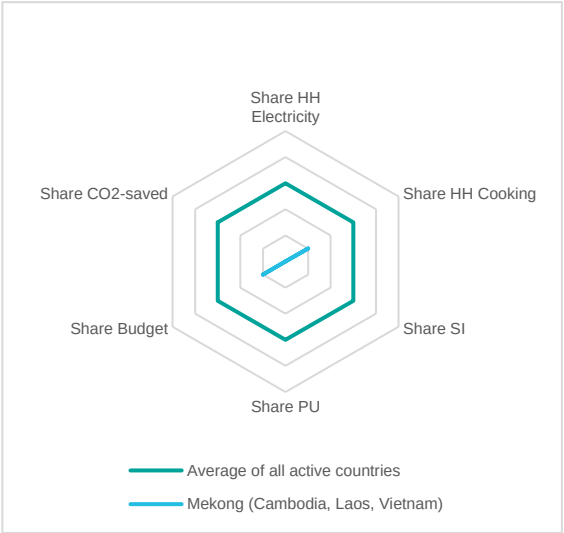
Cambodia (with activities in Laos) - Laos

Section 1: Key facts

Country facts	
Population	7.1 million
HDI	140 ↑ | Total (0.61)
UN Classification	LDC
Access clean cooking	17 % (urban) < 5 % (rural)
Access electricity	99 % (urban) 97 % (rural)

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
Implementer	SNV
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• The project is strongly in line with the political call for a **stronger push towards SDG7** by harnessing locally available cooking solutions and by capacity building of local entrepreneurs. • EnDev is an active partner for the Lao government through **policy dialogue** and supports the government's objectives to reduce indoor air pollution, forest degradation, and carbon emissions. • The project plays a crucial role in expanding the **highly successful national ICS ecosystem** to unserved populations; contributes to establishing national ICS quality standards; and introduces gradually higher tier cookstoves into the local value chain. • Vulnerable communities are targeted with **leave-no-one behind approach** in collaboration with other development projects.
Contribution to paradigm shift	• Scaling through **replication/ multiplication of successful ICS ecosystem** to new untapped areas. Constant increase in outcomes from 5,000 ICS/month to now 8,000/month, reaching significant additional share of population. • **Transformative change** in the ICS market pursued by (a) consolidating on-going initiatives in ICS supply chain, (b) setting up additional production centers (#6) in untapped provinces addressing large market potential, (c) professionalization of the sector by capacitating producers (#29), distributors (#10) and retailers (#1,400), and (d) institutionalizing the ICS quality assurance and product labelling system. • **Sustainability of market functions** (stove testing, R&D, quality assurance/labelling) ensured with Lao government's 'Renewable Energy and New Materials Institute' having taken ownership of entire process. Local structures (incl. carbon income for sector self-sustainability) well developed as basis for transformational growth.
Important collaborations for scaling up	**Funding and investment** • EnDev cooperates with **local NGO 'ARMI'** (Association for Rural Mobilisation & Improvement), leveraging resources from their community-based inclusion project and carbon revenues received from the sales of carbon credits generated by ICS. • Collaboration potential with the World Bank/ESMAP/MEM supported **Lao Clean Cookstove Project** (roll out of 50,000 energy efficient forced-draft gasifier cookstoves) still to explore
	Implementation

	• Collaboration with the Lao Ministry of Science and Technology (MoST) – **Renewable Energy and New Materials Institute** (REMI) for optimisation of local production and sustainability of market functions (quality assurance/labelling, R&D). • Collaboration with the **Lao Women Union** instrumental to scale up integration of women by supporting women entrepreneurs and women-led businesses, while also targeting women in demand activation through Behavioural Change Communication (BCC) and household dialogue approaches.
	Knowledge sharing and learning • EnDev supports actively knowledge sharing and learning through policy dialogue and participation in **stakeholder platforms**.
Gender	• A **gender analysis** has not been specifically conducted for the EnDev project, however secondary data sources exist that are relevant for the project and are taken into account for the design of the project's activities.

Consideration of ITAC recommendation

Reigniting government focus: The government's buy-in is being fostered through the strategic involvement of its Renewable Energy and New Materials Institute (REMI) to take ownership of the research and development, quality assurance, labelling, and stove testing sector functions. The Lao Women Union (LWU) – a parastatal organisation with still high government influence - is at the forefront of supporting promotional and behavioural change activities. There is also a plan to cooperate with Ministry of Energy once the World Bank funded clean cookstove project will finally commence.

Exchange of ideas between Laos and Cambodia: The project teams in both the countries are constantly in contact to share ideas, innovations and lessons. There were two exchange visits organised – one to Cambodia and the other to Laos for the project teams to share ideas and learn from each other. The visit to Laos included participants from the Cambodian ICS producer's association.

Partnership with the World Bank: As the procurement process took longer than anticipated, World Bank's Lao Clean Cookstove Project has not yet started. Once operational, EnDev will look for potential for collaboration.

Gender responsiveness: Gender mainstreaming is a central aspect of EnDev's strategy in Laos, a number of gender indicators have been made integral part of the project monitoring; gender mainstreaming activities have been imbedded in the regular production and distribution support, training and capacity building, quality assurance, market development etc.. E.g. EnDev supported the establishment and strengthening of women-led (i) production centres (14 out of the total 30 entrepreneurs), (ii) distribution system (4 out of total 10), (iii) sales and retail outlets (more than 80% female out of 1400 retailers), and inclusion of women as production workforce (45%).

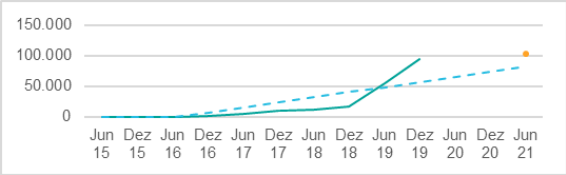
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

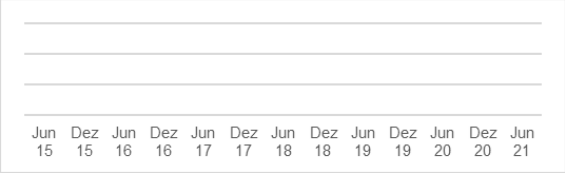
HH Access Cooking

Targets: 103,000 Achieved: 94,973



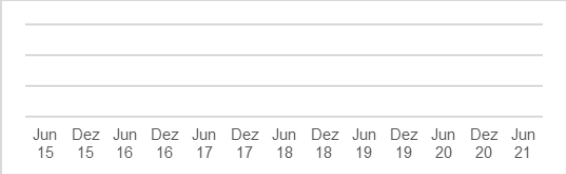
SI Access

Targets: 0.0 Achieved: 0.0



HH Access Electricity

Targets: 0.0 Achieved: 0.0



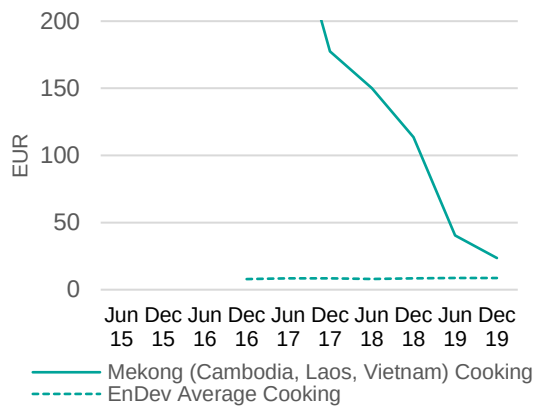
PU Access

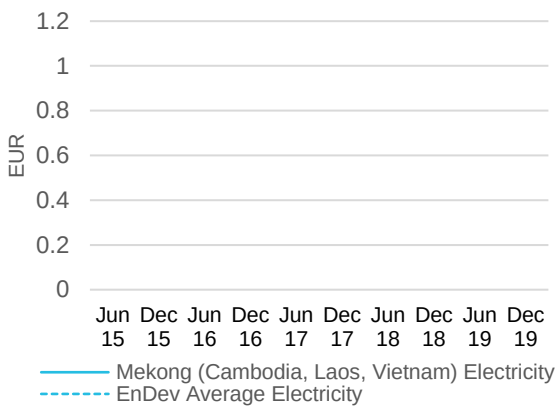
Targets: 0.0 Achieved: 0.0

Additional info

- The high and growing outcome achievement for **HH Access Cooking** is due to a very well-functioning ICS ecosystem for which supply chain actors involved in production, distribution, sales, quality assurance, research and development and after-sale service have been capacitated significantly to provide quality products and services – also for the ongoing extension of this market ecosystem into the unserved Northern provinces.
- Despite the challenging situation due to **COVID-19 pandemic**, ICS production and sales figures in Laos are maintained to a satisfactory level. Once the lockdown and restrictions were lifted in May 2020 sales picked up again.

Efficiency





Additional info

- **Cooking efficiency** is improving significantly due to the recent increased sales of ICS in Laos over the course of 2019/2020. This sharp trend towards improved cost-efficiency is expected to continue as ICS sales continue to increase constantly.
- Despite negative effects of COVID-19 on ICS supply chain, the anticipated **target will likely be exceeded**, ensuring even higher cost-efficiency.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Cooking Sector

The EAMD scorecard exercise suggests that the conventional ICS market (especially tier-2), both in terms of demand and supply side has developed quite well since the last EAMD assessment in 2018. The project combines expanding the ICS market share in the existing well-established market in the South of Laos, opening up the new market in the North, and in parallel promoting more expensive, gradually higher-tier stoves in the nascent urban market where affordability is slightly better.

Generally, the ICS market in Laos is being upscaled successfully under regular (non-RBF) EnDev funding. There is still a very high potential for local tier-2 ICS in untapped geographical areas that the market has not yet reached. The higher-tier stoves market (tier 3+) is still in an early market development stage and more market-building type of support is needed for the coming years.

Overall, quality awareness support is most important for sector development as the ICS market in Laos is dominated by 'look-alike' stoves produced by untrained producers. These sub-standard stoves are often sold for a low(er) price. Quality ICS commercialization supported by EnDev is challenged by these stoves produced without complying with quality standards.

COVID-19 is not expected to impact the ICS market in Laos negatively. Yet due to the predicted economic slump it may affect the willingness/ability of families to invest in higher-end stoves. The below assessment of the market development status was done by a group of eight members comprising representatives from ARMI, REMI/MoST, from ICS producers' community and from SNV. As there was no significant difference between pre and post COVID-19, the assessment was focused on the July 2020 status only.

The scorecard indicators related to enabling environment indicate that government involvement for ICS promotion could be still improved – despite an already good cooperation with some government partners (REMI/MoST, Lao Women Union). Also, the involvement of other development partners and donors for clean cooking is limited with the coming World Bank project being an exception.

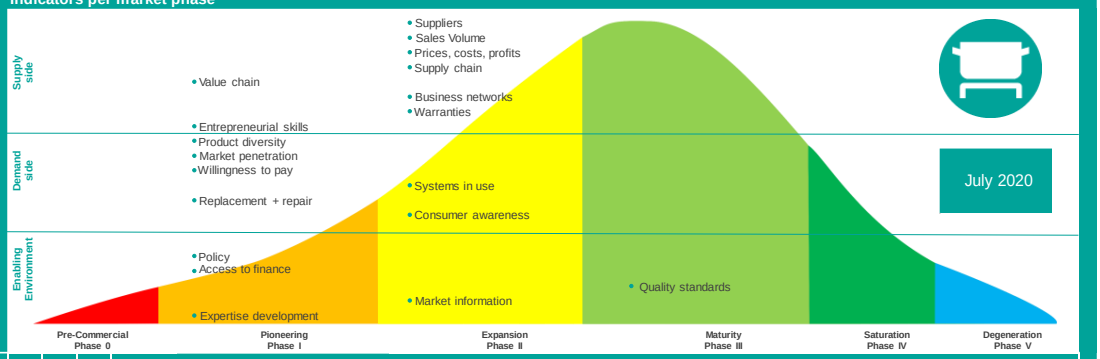
Summary EnDev Market Scorecard: Laos July 2020 Improved cookstoves

Market: With a view to balancing leave-no-one-behind and commercialization of advanced cookstoves, the project is building on existing low tier ICS ecosystem to pioneer high-tier stoves. This energy market scorcard reflects the current low-tier low-cost ICS market for the entire country. The ICS market is more matured in central and southern parts of the country than in Northern regions where the interventions has recently started.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	→	↑	↑	The effect of lockdown and restriction on movement on the business was visible but not very significant. The producers continued production though there were difficulties in distribution.
	S1V2	Business modalities	→	↗	↗	Some of the producers have now started to work full time in their production yard. The number of staff employed is also growing with the gradual increase in demand.
	S1V3	Formality	↗	→	↑	There is visible increase in formal registration of business in both production and distribution value chain. Many of the retailers are still operating informally.
	S1V4	Jobs created	↗	↑	↗	With the increase in demand of ICS, the producers have gradually grown their business with the addition of full-time and part-time work forces.
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↑	The production capacity of ICS producers working under the framework of the project has increased from an average of 7,825 stoves (both intervention and non-intervention stoves) per month in July 2019 to 11,288 in June 2020 (44% increase).
	S2V2	Inventory turnover	▯	↑	↗	The inventory turnover still remains low despite the increase in number of sales. However, there is visible increase in 2020.
S3 Prices, costs and profits	S3V1	Prices	↗	→	↗	Though there are price competitions, the affordability of people in rural areas where ICS are mostly sold is still low. Producers need to focus on low-tier low-cost ICS to sustain their markets.
	S3V2	Costs	↘	↗	↗	Cost per unit has started to decrease with the optimization of design and compulsion to match the affordability of people which is low.
	S3V3	Profit margin	↘	↗	↑	The profit margin to producers are still low, mainly because of the unhealthy market competition with sub-standard unregulated ICS in the market.
	S3V4	Investments	↗	↗	↗	Few of the producers have started investing in modernizing their production process and diversifying their products.
S4 Supply chain and after-sales service	S4V1	Length	↗	→	↑	There is distinct growth of supply chain actors - producers, distributors, retailors and quality monitors operating in the ICS sub-sector.
	S4V2	Distribution channels	↗	↑	↗	Though there is sharp rise in numbers as well as capacity of distributors, majority of them are operating in urban and peri-urban areas. The distribution channel needs to be strengthened in rural far-flung areas where the critical mass lies.
	S4V3	Spatial reach	↗	↑	↗	Most of the businesses are centered around urban and peri-urban areas. The project has supported the operationalization of production and distribution in unserved areas, especially in the northern parts of the country.
	S4V4	Initial suppliers	▯	↗	↗	The number of initial supplier has been increasing. In 2020, six new production centers and more than 500 retailers are added in the ICS supply chain in the country.
	S4V5	After-sales service	▯	↑	↗	Though the ceramic stoves being disseminated under the framework the project do not necessitate complicated after-sale-services, the retailors have started availing necessary spare parts.
S5 Value chain	S5V1	Value added	↘	↑	↗	Value addition remains still low.
S6 Business networks	S6V1	Networks	↗	↗	↑	The producers have started routine consultations and they are in the process to establish producers' association. They are now more proactive in sharing knowledge and information.
	S6V2	Partnerships	↗	↑	→	Most the businesses are operating without any partnership. With the need to diversify businesses and fulfill the growing demand of product and services, some of them are thinking for partnership.
S7 Warranties	S7V1	Warranties	↘	↗	↗	In majority of the cases, ICS are sold with warranties. The sellers assure customer of any after-sale services needed.
S8 Entrepreneurial skills	S8V1	Financial literacy	↘	↑	↗	With support from the project through training and capacity building, the producers are now aware of business (sales and marketing) skills.
	S8V2	Satisfaction level	↗	↑	↗	With the increase in sales volume as a result of enhanced awareness of people, the level of satisfaction of supply chain actors is increasing.
	S8V3	Marketing skills	↘	↑	↑	Businesses have now started to organize marketing campaigns such as road-shows by their own.
	S8V4	Advertising	↘	↑	↗	In 2019, advertisement and promotional activities were solely initiated and supported by the project. However, in 2020, the producers have started introducing their products through advertisements and other forms of promotional activities.
	S8V5	Production automatization	↗	↑	↗	Due to availability of cheap labour force, the production process is still labor-intensive though some of the producers have adopted automation and optimization initiative.
	S8V6	Standardized production	↓	↗	↑	Though the producers are made aware of the importance of standardized production process, new producers are yet to internalize the process. The older producers are producing good quality ICS.
D1 Product diversity	D1V1	Diversity	↗	↑	↗	With a view to balancing leave-no-one-behind and commercialization of advanced cookstoves, the project is building on existing low tier ICS ecosystem to pioneer high-tier stoves. There are different designs of low cost stoves being disseminated to cater the need of different segments of customers.
D2 Market penetration	D2V1	Market penetration	↓	↑	↗	Market penetration in the rural far-flung areas has increased significantly with 6 new production centers operating in northern provinces in the country. For example, a local company is distributing 4,974 ICS in one of the remote provinces in the north (Huaphanh).
D3 Willingness to pay	D3V1	Willingness to pay	↗	↑	↗	Willingness to pay has increased significantly with the raised awareness of people, however, the affordability still remains a challenge. Customers are still tempted to buy ICS of substandard quality which are cheaper than those certified by the project.
D4 Systems in use	D4V1	Usage rate	↗	↑	↑	The usage rate has been observed to be improving. Though, the users are found to be using conventional cookstoves to cook some of the indigenous meals, majority of them are using ICS.
	D4V2	Maintenance	↗	↗	↗	As the ICS being disseminated under the framework of the project do not necessitate complex and vigorous maintenance works, the users are well in position to carry out required operational and maintenance activities.
D5 Replacement and repair	D5V1	Replacement rate	↗	↑	↑	The outcomes of formal and informal discussions with the users have revealed that majority of the users are replacing their old stoves with the new one. This is mainly because of the perceived benefits of ICS.
	D5V2	Repair rate	▯	↑	→	The required repair works are minimum. Users can do the such repairs.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↑	Various awareness raising activities and behavior change communication initiatives through Lao Women Union have been instrumental in fast growth in awareness of people. However, there are still areas in rural part of the country that need a big push.
	D6V2	Perception	↗	↑	↑	Cooking demonstrations, behavioral change communication and awareness raising activities have resulted positively in changing the perceptions of people and increasing the sales volume. Most of the users visited to conduct user' satisfaction survey have expressed higher level of satisfaction.
E1 Policy	E1V1	National plans	↗	→	→	The government does not have specific target related to ICS but the national plan vaguely talks about the importance of clean cooking.
	E1V2	Policy	↗	→	→	There is no Biomass Policy. The RE policy also does not specifically set a target on ICS. The RE policy is being revised and it is expected that clean cooking will find an ample space on the new policy regime.
	E1V3	Product taxes	▯	↗	→	The supply chain actors - producers, distributors and retailers, do not receive any tax exemption. There is no provision for such incentive.
	E1V4	Business taxes	▯	↗	↗	The process of registering has started and few business have formally registered. Those formally registered have started to pay taxes.
E2 Access to finance	E2V1	Subsidies	↗	→	→	There are no consumer or supplier subsidy being provided except technical backstopping supports from project. The market is developing without subsidy.
	E2V2	Financing options suppliers	↘	→	→	The value chain organizations, specially the producers are yet to become bankable to attract financing through them. However, the product and services have been recognised by them as viable business.
	E2V3	Financing options consumers	↘	→	→	Consumers do not have access to affordable finance. All the customers pay for product and services in cash.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	→	→	The producers are bound to comply with the quality standards. ICS that pass quality control only get labeling. However, there are still look-alike stoves sold with fake quality stickers.
	E3V2	Enforcement	▯	→	→	The enforcement of norms and standards are being taken care of by a non-governmental organization supported by the project. The role of government is limited to monitor the work of the organisation conducting quality control. However, the government is fully involved in testing and R&D of ICS.
E4 Market information	E4V1	Cost of information	↗	↗	↑	With the implementation of awareness and promotion activities by the project, data and information related to ICS dissemination is available to customers and suppliers.
	E4V2	Market facilitation organizations	▯	↗	↗	Different development organizations as well as private sectors have been internalizing the importance and suitability of ICS for the rural population. They have started facilitating the market integrating ICS with other development activities.
	E4V3	Awareness campaigns	↑	↑	↗	Lao Women Union is supported by the project to get involved in disseminating awareness raising activities and activities related to behavioral change communication. They have started to integrate ICS in their routine activities.
E5 Expertise development	E5V1	Courses	▯	↑	→	The donors are supporting training and capacity building initiatives. There is no specialised study course or training available in the open market.
	E5V2	BDT	↘	↗	↑	The training and capacity building initiatives conducted by donor funded projects include some sessions on business development. However, there are no such initiatives outside of the project.
	E5V3	User training	▯	↗	↗	The suppliers and value chain actors provide training, mostly customized/tailor-made training to users on operation and maintenance of ICS.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• High potential for market development of ICS through **well-developed local structures** (independent quality assurance/ labelling) owned by the government (REMI/MoST) important to foster consumers' confidence on products and services; and carbon income for sector sustainability (ARMI). • High potential for scaling up and sustainability through active involvement of **Lao Women Union** at the provincial levels in awareness building, behavioural change communication and after-sale backstopping. • **Successful advocacy** and support measures for increasing the female voice in the private (decision-making on spending household budgets) as well as the public sphere (role of females in ownership, in producing and retailing) has resulted in a high uptake of stoves. • Planned support for setting up and strengthening of an **ICS Producers' Association** will help to advocate for conducive policies & targets, investment and level playing fields for private sector development.
Supply side	• Exploration of **market potential for higher tier ICS and electric cooking** and identification of "low hanging fruits" activities through which (international) suppliers/producers can be motivated and persuaded to pilot higher tier stoves and electric cooking incl. cooperation with the forthcoming World Bank funded project to pilot and test the market and business models. • Optimized local production (quality assurance, testing, R&D, after-sale-services) and marketing structures form a strong basis to further **penetrate unserved areas** at the same time laying the foundation for later transition to higher tier stoves. • New promising **social media** tool for promotion and sales of ICS supported by EnDev with high potential to contribute to further market development. (https://www.facebook.com/improvedcookstoves/). • The envisaged **ICS Producer Association** supported by EnDev will contribute to the professionalization and sustainability of the supply side.
Demand side	• Reinforcement of **consumer awareness** for quality ICS and established brands and quality labels to combat low quality 'look-alike' stoves produced by untrained producers; **tailor-made awareness raising initiatives** at different levels for producers, distributors, retailers, customers, and other stakeholders. • Further intensification of **ICS sensibilisation work** by the Lao Women Union and other value chain organisation with routine activities is boosting demand. • Potential to **open up of new markets and demand** in new regions of Laos by piggybacking on other public and private development initiatives.

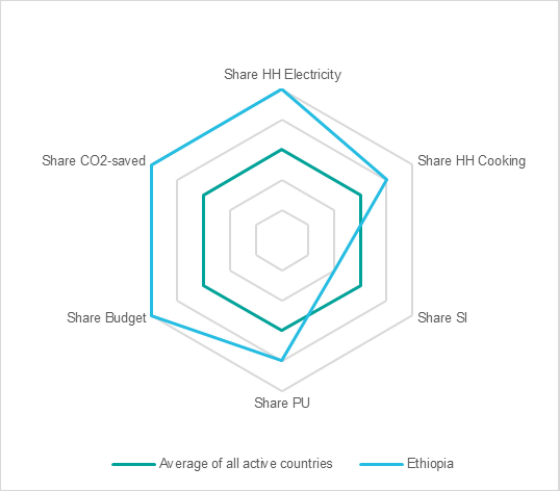
Ethiopia

Section 1: Key facts

Country facts	
Population	112,078.2 million
HDI	173 ↑ | Total (0.47)
UN Classification	LDC / LLDC
Access clean cooking	24 % urban < 5 % rural
Access electricity	92 % urban 33 % rural

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
Implementer	GIZ, SNV
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• **SDG7 high-impact country** that aims to provide 60 million people with electricity access and 80 million people with improved cooking energy in coming years. • The **National Electrification Program** (NEP2.0) aims to achieve universal access by 2025 with 65% through grid connection and 35% through off-grid solutions. • **One of EnDev's largest country interventions**, facilitated access to energy for 2.8 million people to-date and aiming for dynamic target achievement in the lead-up to 2030. • **Trusted partner and strong advisory position** in national policy-making and sub-national governance; interventions address issues central to the Ethiopian Government's development strategies for energy and climate. • **Strong expertise** in electrification of social institutions, scaling of mini-grids, professionalization of clean cooking and stand-alone off-grid solar market.

Contribution to paradigm shift	• **Re-structured project setup** to move energy sector to transformative scale through increase in enabling environment (polices, regulatory framework, strengthened sector industry associations) and finance sector work.
	• Potential for **sector transition**:
	  ○ **Mini-Grids:** Due to early pioneering work EnDev is go-to partner for government and development partners for mini-grids work in Ethiopia. Now increase in enabling environment/policy work and advisory to the government aiming to establish blueprint for replication at scale. Strong collaboration with government partners, EU. Considerable own financial contributions from the government.
	  ○ **Social Infrastructure**: Highly successful in electrifying rural off-grid public institutions (over 320 installations). Shifting focus to sustainable planning and management, involvement of line ministries to establish standardized process for scaling, leveraging local public investments/integration in public service programs. LNOB focus on very remote/poor areas.
	  ○ **Off-grid solar sector:** Financial systems development for framework conditions/market stability to attract market entry of international PAYGO actors. Support to solar association for sector governance and BDS for companies to scale operations.
	  ○ **Clean Cooking:** Current programming strategy consolidates efforts by focusing resources on best-performing/most promising players to move to semi-industrial production. Accelerating efforts to scale and sector transformation.
	  ○ **Battery recycling:** Leading role in establishing sustainable national approach for battery waste management.
	  ○ **Finance for Energy Access:** Newly created project component, cross-cutting support to all activities to create financial sector conditions for

	investments in energy scaling (working capital loans, consumer finance, mobile money) ○ **LNOB/refugees:** Increasing focus on energy for humanitarian context; introduction of market-based approaches and biomass fuel supply chains in settlements and host communities. ○ **Productive Use and higher tier:** Some experience in PUE for SMEs (mostly through cooking energy), potential to systematically support in various value chains, upcoming opportunity with new Ikea Foundation project. Increased future focus due to mini-grids work. ○ **COVID-19 Emergency Response:** Adapted emergency and recovery programming and use of 'in-the-field' presence to prevent loss of energy access market structures.
Important collaborations for scaling up	**Funding and investment** • In recent years, EnDev Ethiopia received **co-financing worth 13.4 million Euro** for its core programmatic activities from non-EnDev donors: the European Union, Irish Aid and the Korean Fund for International Health (KOFIH); these funds supported project activities across all of EnDev Ethiopia's activities, predominately off-grid solar for social institutions, mini-grids, and off-grid solar and ICS market building. • While KOFIH co-financing is coming to an end, EnDev Ethiopia is pursuing a larger volume follow-on co-financing with **Irish Aid** for predominately clean cooking activities; and **EU co-financing** predominately for mini-grids activities has been extended until end 2022. • EnDev Ethiopia together with EnDev Kenya and EnDev Uganda will execute as of beginning 2021 the new 3-years project "Sustainable Energy for Smallholder Farmers" financed by the **Ikea Foundation** with 8 million Euro focusing on PUE in agriculture value chains to improve rural livelihoods. • Possible co-financing of further rural electrification measures through **SIDA** currently on hold due to the discussions between the governments of Sweden and Germany. • The project is in conversation with several development partners for **new co-financing opportunities**, incl. WB Ci-Dev (battery recycling), and a 500 million Euro mini-grids sector investment of the WB.
	Implementation • The **Ministry of Water, Irrigation and Energy (MoWIE)** is the main political and implementation partner for EnDev Ethiopia at the federal level through which EnDev pursues its ambitions for sector transformation. • EnDev Ethiopia also closely cooperates with the **Ministries of Health, Education and Agriculture**, and as well with the Environment, Forest and Climate Change Commission (EFCCC) in the planning and coordination of interventions. • Especially in the promotion of mini-grids, Ethiopian **regional state energy agencies** are core partners of EnDev with considerable own financial contributions.

	• **Refugee activities**: collaboration with UNHCR, Ethiopian Agency for Refugees and Returnees Affairs (ARRA), GIZ ESDS; EnDev refugee activities are mostly now handled through a standalone BMZ-financed project component '**Energy Services in Displacement Settings'** that largely builds on EnDev's project structure.
	Knowledge sharing and learning • Participation in regular joint meetings and contribution of events of the **Energy Sector Development Partners Group** chaired by the State Minister of the Ministry of Water, Irrigation and Energy and currently co-chaired by the Danish Embassy and the World Bank to convey the learnings and experiences from EnDev's practical on-the-ground operations. • Participation in monthly information exchange and knowledge sharing meeting that is organized with the **World Bank Off-grid team.** • EnDev Ethiopia leads coordination of the '**Biomass Working Group'** and the '**Energy and Environment Group**'.
Gender	• A **gender analysis** was conducted in 2017 and is currently in the process of being updated. • Gender aspects are mainstreamed into all on-going implementation activities and the project uses gender analysis to inform its actions. The project is in the process of concluding an agreement with the **Ethiopian Women in Energy Network (EWiEN)** that will anchor and be actively involved in in EnDev Ethiopia's ongoing gender measures.

Consideration of ITAC recommendation

Consolidation of core activities and integration into public programmes: Key strategic ambition of EnDev. Good progress has been made with restructuring of project operations and identifying partnerships to amplify development effects.

Engagement of Government of Ethiopia for sustainability of longer-term market building efforts: The government is the main implementation partner for EnDev at federal and sub-national levels. Engagement and capacity building of the government partner is central to every activity of EnDev.

Expertise to implement focus on policy & advocacy: Organisational restructuring process is ongoing, adding policy experts to EnDev team.

Battery recycling: The project is in contact with WB Ci-Dev about potential collaboration/co-financing; country-level experiences/studies will be shared; alignment with international protocols/practices is pursued.

Financial systems development: Scope of component is currently identified by a deep-dive study and identification of initial activities. Collaboration with GIZ global program 'Financial Systems Development (FSD)' has started. Specialized staff/experienced financial firm currently being recruited.

Awareness and promotion campaigns: Extensive campaigns in cooking sector continue in current programming phase**.**

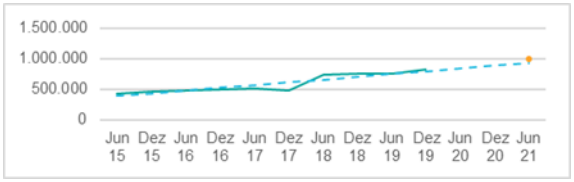
Quality of response to ITAC recommendations (on a scala from low-medium-high): **low**

Section 3: Performance

Effectiveness

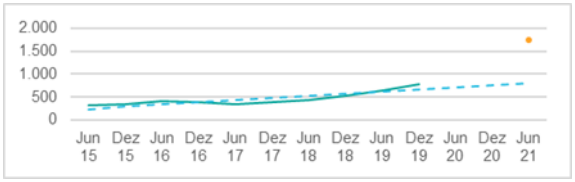
HH Access Cooking

Targets: 990,000 Achieved: 821,472



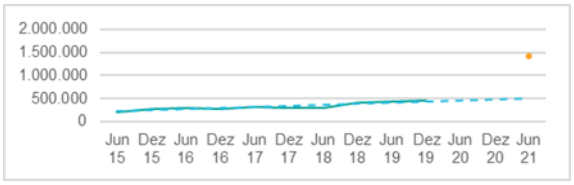
SI Access

Targets: 1,750 Achieved: 770



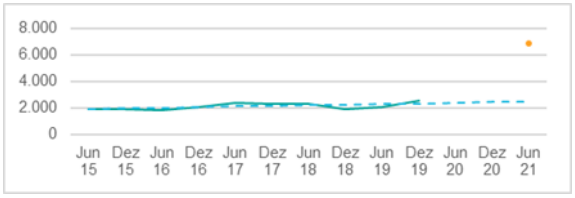
HH Access Electricity

Targets: 1,430,000 Achieved: 467,041



PU Access

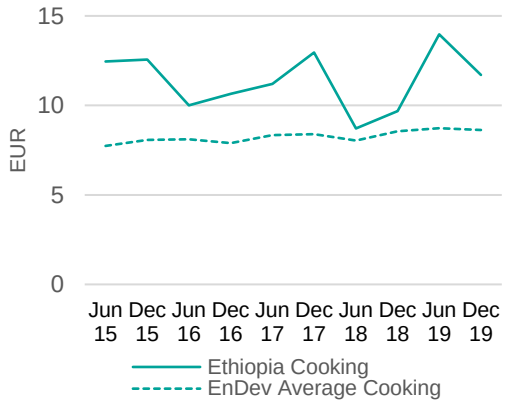
Targets: 6,850 Achieved: 2,525

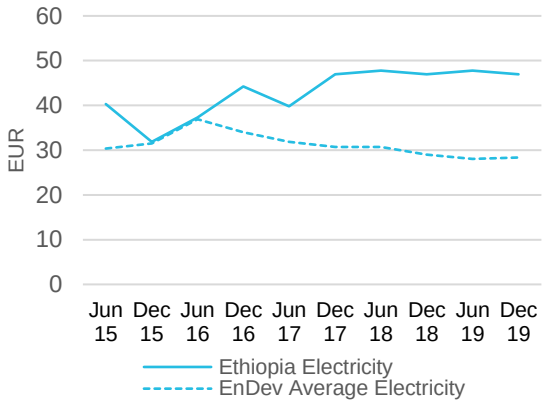


Additional info

- Targets for current programming phase until end 2022 were set based on **expected dynamic target achievement** due to programmatic changes that should lead to accelerated growth/sector scaling. Targets are ambitious, yet realistic, they are, however, contingent on sectors becoming more dynamic (scaling effects, increased public and private investments, positive development of framework conditions). As some of these factors are outside of the project's control, targets will need to be reviewed regularly and adapted as needed.
- Targets for **HH Cooking Access** will be met and exceeded ahead of time (in pre-COVID-19 scenario). Impact of COVID-19 is seeing decline in HH Cooking Access figures in recent months, but future prognosis not clear yet.
- Meeting lagging behind **HH Electricity Access** target will require at least doubling of half-yearly sales of off-grid solar. This target will likely need to be revised for next programming phase.
- Targets for **SI and PU** are ambitious but achievable. The project is looking to put a stronger focus on employment promotion – a topic that is receiving particular interest from government and development partners. Moreover, the project's Financial Systems Development component aims to address the issue of access-to-finance, which is known to be one of the key bottlenecks for the adoption of renewable energy technologies by productive users.

Efficiency





Additional info

- In line with EnDev Ethiopia's strategic re-orientation to support sector transformation through strengthened work on the enabling environment by policy and finance sector advice, as well as by strategic partnerships, the project is significantly investing in building capacities of public sector partners, solar and ICS industry associations, civil society organisations/NGOs and implementation partners to expand sector dynamics. These are **up-front investments** that will only over time result in dynamically evolving target achievements.
- Likewise, the project has made significant investments for instance in the development of the **mini-grids sector** that will only at a later reporting stage see new energy access generated through a larger number of mini-grids.
- The recurring public unrests and consequent **security concerns** and reduced mobility during the operation year in all of Ethiopia's regional states led to extra costs (e.g. extra security for regional offices/solar equipment storage; additional costs for marketing/promotion campaigns).

Section 4: Potential

Assessment of (sub-) sector and/or market development

Electricity Sector

With Africa's second largest population at over 100 million people, 80% of which reside in rural areas, electrification in Ethiopia is available for 45% of the total population (2018), with 33% of the rural population. Electricity demand grows by approximately 30% annually. The **solar market** in Ethiopia is only at the development stage, with a slow growth rate. The exemption of quality off-grid solar products from import duties and sur-taxes in Ethiopia, as well as a general decrease of global market prices for key components such as solar PV panels and batteries, has helped to lower the costs for wholesalers, retailers and, ultimately, consumers. As a consequence, more solar PV wholesalers and retailers have entered the market in recent years. However, they are still few in number and the majority of them continue to be small and lack the financial means to purchase quality products via regulated channels. This is also worsened due to a limited foreign currency in the country. The solar market is still characterised by major challenges: low quality products (and services), lack of consumer awareness about additional benefits of quality products, lack of supply and retailing chain up to grassroots levels and lack of after sales services as well as lacking access to finance for both end users and solar PV businesses. **Mini-grids** (mainly solar PV) are now being prioritised by government policies over standalone SHS due to their greater rural development potential. However, lack of a clear regulatory framework and policies around the cooperative model of (mini-grid) rural electrification in Ethiopia remains an impediment. **Solar PV demand in social institutions** is usually for powering lights and electric appliances, especially in the health and education sectors. Sustainability of the institutional solar PV systems is greatly affected by often insufficient installation and maintenance of solar PV. **Productive use of energy**, such as solar pumping and solar cooling is still at a pilot stage and there are no proven business models and technology/service packages in the market. Use of solar technology in off- grid areas is still limited to lighting in businesses for increasing productive hours in the day and also running small machines and tools such in a barber shop. The manufacturing sector is just emerging, and it is mainly the context of grid-connected industrial parks developed by the government.

Cooking Sector

ICS as well as the clean fuels market in Ethiopia is at an early stage of evolution, i.e. dominated by artisanal production and marketing where building capacities across all areas of the supply chain and generating customer demand is still required. First examples for PU of ICS have been supported by EnDev (e.g. efficient use of solid biomass fuels for commercial baking). The very low capitalisation in the sector, absence of wider retail networks for ICS, as well as the low awareness about their benefits, are some of the main factors impeding the growth of the ICS market. As the below market scorecard shows the consumer awareness level has moved to the expansion phase, however the rest of the variables remain in the pre- commercialisation and pioneering phases. Market penetration, willingness-to-pay and systems in use are at the very early stages; product diversity, replacement and consumer awareness grew to the second stage.

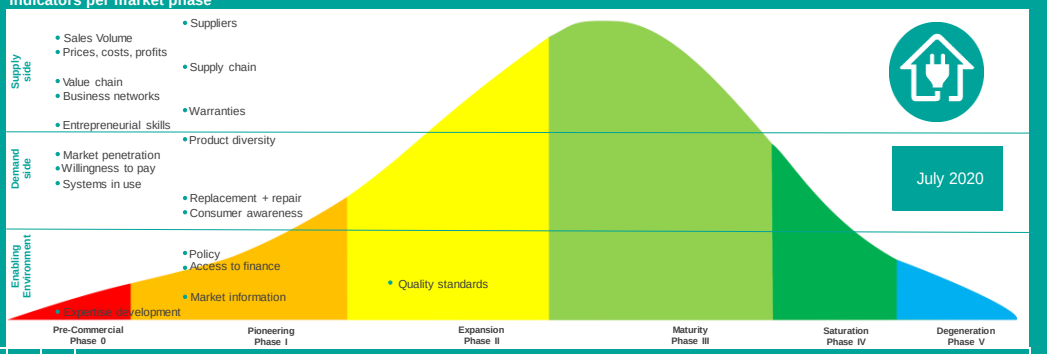
Impact of COVID-19

The COVID-19 pandemic has caused a significant negative impact on the implementation and the energy market in general. EnDev Ethiopia has developed a fast tracked COVID-19 impact response measures to provide with conditional grant and market stimulation consumer prices subsidy package of 2.3 million Euro to support its small and micro partner enterprises which constitute more than 70% of the quality products and services in the market.

Summary EnDev Market Scorecard: Ethiopia July 2020 Solar Products

Market: The main focus is the the solar PV products market located in the four regions of the country namely Amhara, Oromia, SNNPR and Tigay. The data is collected from the solar enterprises, government and EnDev energy experts. The process is consultative, and the stakeholders reached consensus on the market situation.

Indicators per market phase



Market trends

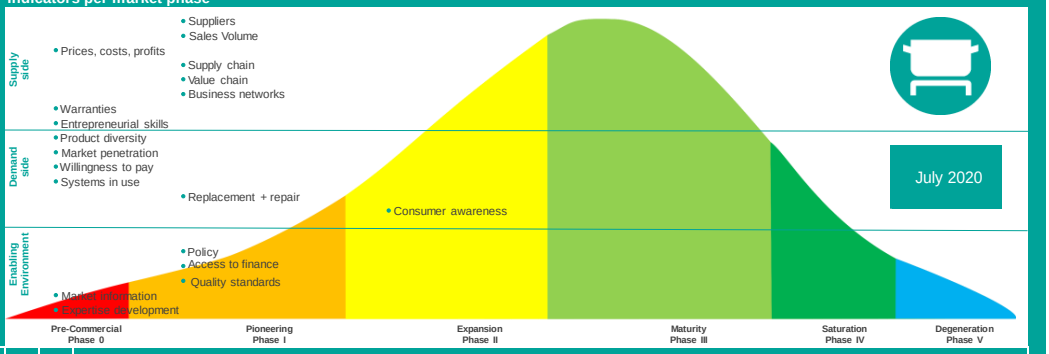
Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↑	↘	•The Ethiopia governmenthas declared an epidemic/pandemic situation due to Covid-19. •Consequently a state of emergency has been declared severly and comprehensively restricting of mobility all ove the country. •Government offices on the federal, regional, district and village level are either closed or instructed to work only on strictly limited and essential cases. This severely obstructs coordination and required on-the-ground support of the local government experts. - EnDev conducted survey shows more than 70% of the solar enterprises are on the verge shutting down their bussiness. - taking sales performance of enterprises supported by EnDev Ethiopia as an exsample, sales dropped by about 300% compared to the 2019 second semister figures. - The market performance indicators show a downward trend in all market indicators.
	S1V2	Business modalities	↑	→	
	S1V3	Formality	↑	→	
	S1V4	Jobs created	↗	↓	
S2 Sales Volume	S2V1	Products / services sold	↑	↓	
	S2V2	Inventory turnover	↑	↓	
S3 Prices, costs and profits	S3V1	Prices	↑	↓	
	S3V2	Costs	↑	↘	
	S3V3	Profit margin	↑	↘	
	S3V4	Investments	↑	→	
S4 Supply chain and after-sales service	S4V1	Length	↗	↓	
	S4V2	Distribution channels	↑	↓	
	S4V3	Spatial reach	↑	↓	
	S4V4	Initial suppliers	↗	↓	
	S4V5	After-sales service			
S5 Value chain	S5V1	Value added	↑	↓	
S6 Business networks	S6V1	Networks	↗	↓	
	S6V2	Partnerships	↑	↓	
S7 Warranties	S7V1	Warranties	↑	↘	
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	→	
	S8V2	Satisfaction level	↗	↘	
	S8V3	Marketing skills	↗	→	
	S8V4	Advertising	↑	↘	
	S8V5	Production automatization	▽	▽	
	S8V6	Standardized production	▯	▽	
D1 Product diversity	D1V1	Diversity	↑	↘	The economic downturn coupled with ristricted mobility as the consiquesnce the pandamic situation and state of emergergency stifeld demand and hence all demand side indicators are either negative are stagnant.
D2 Market penetration	D2V1	Market penetration	↑	↓	
D3 Willingness to pay	D3V1	Willingness to pay	↗	↓	
D4 Systems in use	D4V1	Usage rate	↑	↓	
	D4V2	Maintenance	↗	→	
D5 Replacement and repair	D5V1	Replacement rate	→	→	
	D5V2	Repair rate	→	→	
D6 Consumer awareness and perception	D6V1	Awareness	↑	↓	
	D6V2	Perception	↗	↘	
E1 Policy	E1V1	National plans	↑	→	The whole focus of policy dialogue is now on averting the spread and adverse impacts of the Covid- 19 pandemic Hence all enabling environment indicators are either stagnant or negative.
	E1V2	Policy	↗	→	
	E1V3	Product taxes	↗	↗	
	E1V4	Business taxes	↗	↗	
E2 Access to finance	E2V1	Subsidies	↘	↓	
	E2V2	Financing options suppliers	↗	↓	
	E2V3	Financing options consumers	↗	↓	
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	↗	
	E3V2	Enforcement	↑	↗	
E4 Market information	E4V1	Cost of information	↗	↗	
	E4V2	Market facilitation organizations	↗	→	
	E4V3	Awareness campaigns	↗	↓	
E5 Expertise development	E5V1	Courses	↗	→	
	E5V2	BDT	↗	→	
	E5V3	User training	↗	→	

Summary EnDev Market Scorecard: Ethiopia July 2020 Improved cookstoves

Market: ICS market in Ethiopia is at an early stage of evolution, dominated by artisanal production and marketing with low capitalisation and scant retail network, where building capacities across all areas of the supply chain and generating customer demand is still required. Though the consumer awareness level has improved, most other market indicators are still in the pre-commercialisation and pioneering phases. COVID-19 pandemic has caused a significant negative impact on every aspect of the market.

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	Dec 2019	July 2020
S1 Suppliers	S1V1	Businesses	↑	↘
	S1V2	Business modalities	↑	↘
	S1V3	Formality	↑	→
	S1V4	Jobs created	↗	↓
S2 Sales Volume	S2V1	Products / services sold	↑	↓
	S2V2	Inventory turnover	↗	↘
S3 Prices, costs and profits	S3V1	Prices	→	▽
	S3V2	Costs	↗	↓
	S3V3	Profit margin	↑	↓
	S3V4	Investments	↗	↓
S4 Supply chain and after-sales service	S4V1	Length	↑	→
	S4V2	Distribution channels	↗	→
	S4V3	Spatial reach	↗	↓
	S4V4	Initial suppliers	↗	→
	S4V5	After-sales service		
S5 Value chain	S5V1	Value added	↗	→
S6 Business networks	S6V1	Networks	↗	→
	S6V2	Partnerships	↗	→
S7 Warranties	S7V1	Warranties	→	
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	↘
	S8V2	Satisfaction level	↗	↘
	S8V3	Marketing skills	↗	↓
	S8V4	Advertising	↑	↓
	S8V5	Production automatization	↗	→
	S8V6	Standardized production	↑	↓
D1 Product diversity	D1V1	Diversity	↗	→
D2 Market penetration	D2V1	Market penetration	↗	↓
D3 Willingness to pay	D3V1	Willingness to pay	↗	↓
D4 Systems in use	D4V1	Usage rate	↑	↘
	D4V2	Maintenance	↑	▯
D5 Replacement and repair	D5V1	Replacement rate	↗	▽
	D5V2	Repair rate	↘	▽
D6 Consumer awareness and perception	D6V1	Awareness	↑	→
	D6V2	Perception	↑	→
E1 Policy	E1V1	National plans	↑	↘
	E1V2	Policy	↑	→
	E1V3	Product taxes	▽	▯
	E1V4	Business taxes	↗	▯
E2 Access to finance	E2V1	Subsidies	→	↓
	E2V2	Financing options suppliers	↗	↓
	E2V3	Financing options consumers	↗	→
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→
	E3V2	Enforcement	→	▯
E4 Market information	E4V1	Cost of information	↗	↗
	E4V2	Market facilitation organizations	↗	↘
	E4V3	Awareness campaigns	↗	→
E5 Expertise development	E5V1	Courses	↗	→
	E5V2	BDT	↗	→
	E5V3	User training	↗	→

Explanation

- The Ethiopia governmenthas declared an epidemic/pandemic situation due to Covid-19.
- Consequently a state of emergency has been declared severly and comprehensively restricting of mobility all ove the country.
- Government offices on the federal, regional, district and village level are either closed or instructed to work only on strictly limited and essential cases. This severely obstructs coordination and required on-the-ground support of the local government experts.
- EnDev conducted survey shows more than 75% of the improved cook stove producers are on the verge shutting down their bussiness.
- taking sales performance of enterprises supported by EnDev Ethiopia as an exsample, sales dropped by more than 800% compared to the 2019 second semister figures.
- The market performance indicators show a downward trend in all market indicators.

The economic downturn coupled with ristricted mobility as the consequence the pandamic situation and state of emergergency stifeld demand and hence all demand side indicators are either negative or stagnant.

The whole focus of policy dialogue is now on averting the spread and adverse impacts of the Covid- 19 pandemic
Hence all enabling environment indicators are either staginant or negative.

Potential for contributing to (sub-) sector transition and/or market development	
Enabling environment	• Promotion of **incentives and financing schemes** for the private Renewable Energy (RE) sector support in national programs that are jointly supported by the relevant development partners in Ethiopia. • Support to institutionalised **standards and performance requirements** to reduce infiltration of poor-quality products, services and business malpractice and to stimulate R&D and innovations in the RE sector. • Enhanced **capacity building** support measures for both public sector and private sector partners in information and knowledge management skills and infrastructure and impact sustainability. • Support development of **innovative financing models and instruments** such as PAYGO. • Development of a roadmap for **sustainability of solar systems** installed in social institutions together with institutional stakeholders. • Support to an enabling environment for the development of **solar mini-grids**. • Enhance the institutional support for a consolidated industry voice for **efficient advocacy and better networking** in the cooking and solar sectors. • Support to **sector associations** like the Ethiopian Clean Cooking Alliance (ECCA) and the regional and national solar industry associations to play the driving force for market expansion of quality products and to develop business and service networks**.**
Supply side	• Facilitation of customised **Business Development Services** for high-potential actors to drive semi-industrial level production and marketing of cooking solutions. • Fostering the capacities of retailers and installers of solar PV products to empower them to promote **safe, quality solar products**. • Facilitation of **international market linkages** and foreign direct investment to forge supply chains and networks. • Promote **innovative business models** that enhance access to the last mile including supportive RBF models. • Support to expanded energy access for essential **social institutions and facilities** including improved management capacities and commercial energy services to social institutions. • Based on experiences with micro-hydro powered mini-grids support to development of cooperative-managed solar powered **mini-grid pilots** including capacity development on management and operation. • Promotion of **productive use of energy** to enhance wealth creation and employment in productive sectors such as agriculture, and in small scale manufacturing value chains and the service sector.

Demand side	• Support to coordinated and consolidated consumer **awareness creation and information** on quality products. • Promotion of financial integration and innovative **consumer financing**/digital financial inclusion in the RE sector. • Promotion of functional and accessible **warranty, maintenance and repair services** to foster consumer confidence. • Promotion **standards and labelling** for increased energy efficiency of appliances and as well for the adoption of cleaner energy solutions.

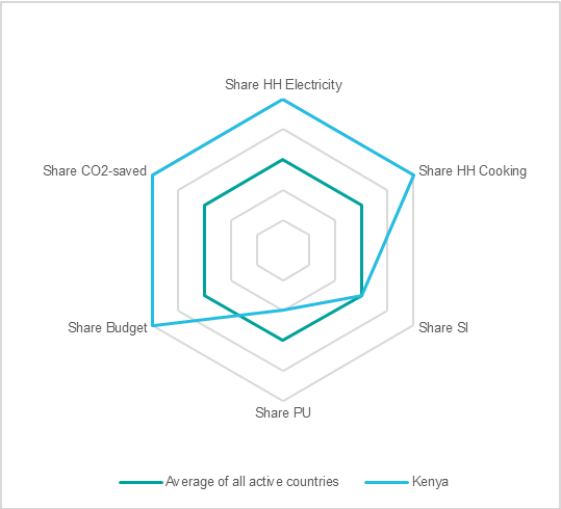
Kenya

Section 1: Key facts

Country Facts	
Population	51.4 million
HDI	147 ↓ | Total (0.58)
UN Classification	Developing economy
Access clean cooking	24 % urban < 5 % rural
Access electricity	84 % urban 72 % rural

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
Implementer	GIZ, SNV, PA
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev Kenya contributes towards the achievement of **Kenya's SEforAll action agenda** and the **Kenya National Electrification Strategy (KNES)** which aim to achieve 100% universal access to electricity and modern/clean/improved cooking by 2022. • EnDev Kenya is aligned with the **National Climate Change Action Plan (NCCAP 2018-2022)** and Nationally Determined Contribution (NDC) that prioritise promotion of improved cooking stoves (ICS) as a high potential intervention that will contribute towards the NDC targets for mitigation of greenhouse gas (GHG) emissions. • The Kenyan **Ministry of Health** prioritize ICS as a major measure to **combat health risks** associated with Indoor Air Polution from traditional cookstoves. • **High contribution of EnDev**: with 3.3 million people (0.70million households) with improved biomass stoves to date, EnDev is responsible for ≈70% of this achievement (Kenya Household Cooking Study 2019); according to 2019 National Census, 19% of the 12 million Kenyan households are lighting with solar, to which EnDev Kenya has contributed over 25%.
Contribution to paradigm shift	• EnDev Kenya focuses on stimulating market development of **Productive Use of Energy (PUE)** with emphasis on economic empowerment and improvement of livelihoods leveraging on energy nexuses with e.g. agriculture, water, trade and value addition. • Exponential growth and scaling up of the growing ICS market is expected from large scale **professionalisation of the local private sector** (local stove entrepreneurs, sellers etc.) through the EnDev GCF project "Promotion of Climate-Friendly Cooking in Kenya and Senegal". • As a complement to improved biomass cooking solutions, EnDev Kenya has ventured into promotion and market development of **higher tier cooking solutions** with focus on piloting efficient **electric cooking** (such as electric pressure cookers) and alternative cleaner fuels.
Important collaborations for scaling up	**Funding and investment** • Collaboration and complementarity with the **EnDev-GCF project** (an offspin of EnDev Kenya) as key for further transformation of the ICS sector in Kenya. • Scaling up activities for PUE activities in agricultural value chains planned in the frame of the forthcoming, new project **Sustainable Energy for Smallholder Farmers** funded by the IKEA Foundation for the period 2021-2023 covering Kenya, Uganda and Ethiopia (8 million Euro).
	Implementation • Close collaboration between EnDev and the **Kenya Off-grid Solar Programme (KOSAP)**, a government energy access programme under the Ministry of Energy and funded by the World Bank with focus on underserved counties.

Alignment with EnDev's new strategy	
	• EnDev and KOSAP **ensure complementary and scaling** with regards to geographical scope, companies supported and general technical advisory; joint sector coordination and advocacy work already started. • Close coordination with a new **SDG 7 Results Based Facility (RBF)** coordinated by RVO. • EnDev aims for partnering with the **Collaborative Labeling and Appliance Standards Program (CLASP)** in the electric cooking component.
	Knowledge sharing and learning • EnDev Kenya as participant in **knowledge platforms** e.g. GIZ Sector Networks and the EnDev Learning and Innovation Group on PUE spearheaded by SNV. • Knowledge sharing, learning and support to advocacy for a better enabling environment for renewable energy businesses in Kenya through EnDev's membership in the two **main sector associations** of the Kenyan cooking and solar sector, the Clean Cooking Association of Kenya (CCAK) and the Kenya Renewable Energy Association (KEREA). • Intensive internal knowledge sharing and learning with the EnDev Kenya **implementing partners** (GIZ, SNV, PA, E4I, HIVOS, CLASP). • Organisation of **webinars** with the energypedia plattform.
Gender	A **gender analysis and action plan** was prepared during the preparation of GCF project which guides mainstreaming of gender measures in the GCF project and the work of EnDev in Kenya. EnDev mainstreams gender measures in project implementation in line with the government gender equality constitutional requirements as well as the **new gender policy of the Ministry of Energy**.

Consideration of ITAC recommendation

Proposal revision in line with GCF project: ITAC recommended a revised EnDev Kenya proposal to explain synergies and complementarities as well as specifics of the EnDev project in relation to the EnDev-GCF project. As the final step for effectiveness of the GCF Funded Activity Agreement (FAA) is only due end of September 2020, EnDev will provide a revised proposal in the upcoming programming cycle.

Synergies with KOSAP: EnDev Kenya contributed its lessons and experiences during the set-up of the KOSAP project and some of the lessons were used to shape the KOSAP supported RBF structure. While KOSAP focusses on until now underserved counties, EnDev strengthens efforts in PUE and access to solar and ICS for SIs as well as in refugee settings, where KOSAP is not operational. The solar home system and cooking component of KOSAP being operationalized by EnDev's implementation partners SNV and by Sun Funder synergies between both projects are identified without delay.

Gender: Several key observations and areas for improvement were identified by ITAC regading gender aspects of the project mainly touching on the strategic approach and specific resources and activities for gender measures. Beyond the gender analysis and action plan (mentioned above) for its cooking component, EnDev was innovating workspaces specifically dedicated to women and contributes to improved women's lifelihoods. With regard to its private sector approach, EnDev takes care that women are having the same opportunities (e.g. as as stove producers, and as solar and ICS last-mile entrepreneurs). In the next programming round EnDev's gender strategy for Kenya will be further refined.

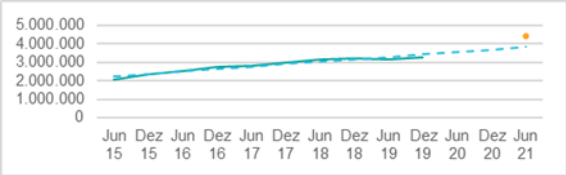
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

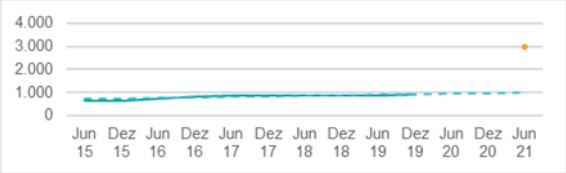
HH Access Cooking

Targets: 4,405,000 Achieved: 3,298,322



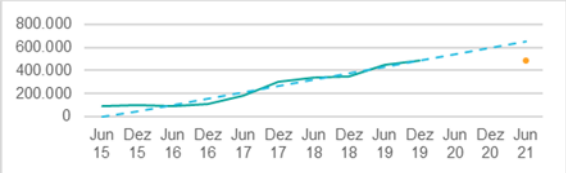
SI Access

Targets: 3,000 Achieved: 903



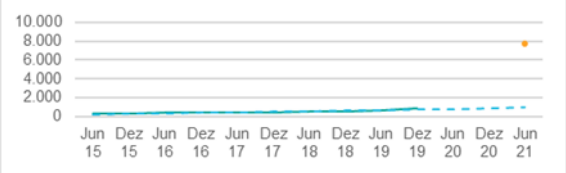
HH Access Electricity

Targets: 490,000 Achieved: 485,488



PU Access

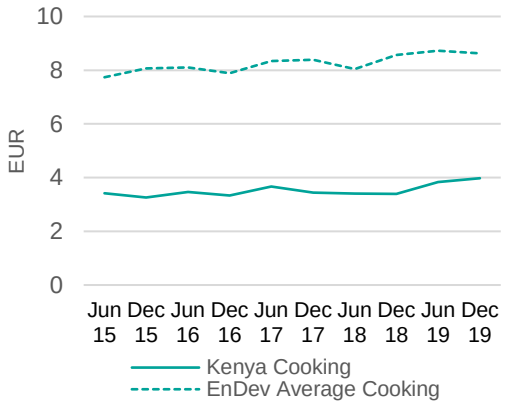
Targets: 7,750 Achieved: 905

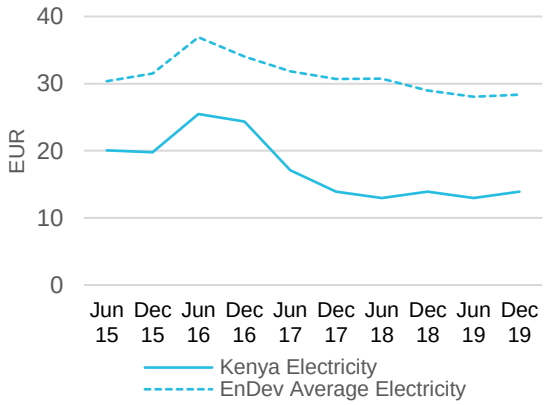


Additional info

- The results for **HH cooking and electricity** also includes the results achieved by Market-based Energy Access (MBEA) pilot project by SNV in the refugee settings which enabled sales of 7,700 small solar systems, 550 industrially produced stoves, and 2,750 locally made stoves through a market-based approach.
- Interventions for **SI and PU access** are prepared as a new focus of EnDev Kenya for the current programming period; however, starting in July 2019 and being substantially handicapped due to COVID-19 already in March 2020 practical implementation activities and thus results are still limited. Having contracted SNV as implementing partner for solar PU access promotion it can be expected that results will soon pick up once the current pandemic allows for it.

Efficiency





Additional info

- The high cost **efficiency of cooking** is attributed to consistent growth of numbers due to affordability of the stoves, promotion of variety of stoves for different market niches and the focus of the project in intervening at the last mile.
- The increasing **cost efficiency for access to electricity** was attributed to the RBF projects where solar companies received incentives for the results achieved. This motivated the companies to deliver more results which led to dropping costs. Making the solar companies take lead in the delivery of results proved to be a highly positive to increase efficiency.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity sector

On electrification, the official 2019 national census reports that 70.1% of Kenyans are electrified comprising grid (50.4%) and solar (19.3%) compared to 2009 with grid (23%) and solar (2%). The electrification in rural areas is reported to be 26.3% (grid) and 29.9% (solar). The tremendous growth of the grid is due to the government investment in last-mile connectivity whereas the growth of solar is primarily driven by the private sector with support from programs such as Lighting Africa and EnDev. The growth of **off-grid solar** has also been driven by innovative business and financing models notably PAYGO which has facilitated affordability of larger systems including DC appliances whose market is, however, still at nascent stage. Given this growth and dynamic market development, EnDev Kenya is putting now a focus on the promotion of **solar for productive use** (with focus on applications and appliances). Promotion of solar home solutions for **refugee settings** has also high potential for further market development.

Cooking sector

Cooking in Kenya is characterized by heavy reliance on **solid biomass fuel** (primarily firewood and charcoal). Official 2019 national census reports that 66.7% of Kenyans rely on solid biomass of which 84.1% reside in rural areas, 23.9% rely on LPG out of which a majority (52.9%) are living in urban areas; 17.7% rely on paraffin and 17.7% rely on charcoal as main cooking fuels. The penetration of cooking technologies correlates to fuel usage with a majority of people using solid biomass stoves which are mainly supplied from the informal sector; however, the **industrially produced stoves** are getting traction with gradual increase in penetration in urban and peri-urban areas, particularly for charcoal. A majority of people don't use electricity as primary means of cooking due to associated high costs, but the emergence of efficient **electric cooking** technologies (e.g. electric pressure or induction cookers) have the potential to change this, particularly for middle/upper class consumers electric cooking is attractive as alternative for stove stacking.

Impact of COVID-19 pandemic

The COVID-19 pandemic has significantly affected operations of businesses due to the health risks, phobia and government restrictions. Consumers are prioritizing on basic and essential goods and services for survival. The pandemic has therefore negatively impacted energy enterprises leading to drop in sales, revenue losses, downscaling and interruption of business activities, high cost of doing business, reducing/laying-off staff/job losses and raising difficulties in accessing working capital/finance.

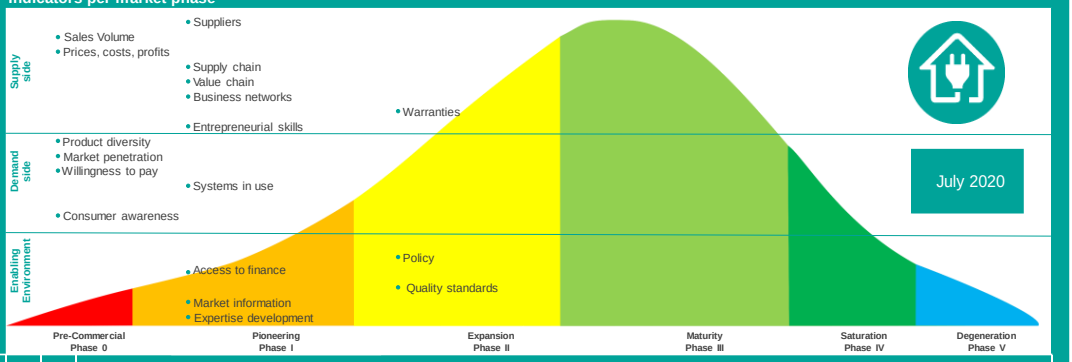
Summary EnDev Market Scorecard: Kenya July 2020 Solar Products

Market: Basic/small scale standalone solar systems appropriate for productive use in business settings and specifically for use by the small and medium-sized enterprises (SMEs), who may include but not limited to small scale traders, small holder farmers, micro enterprises.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase

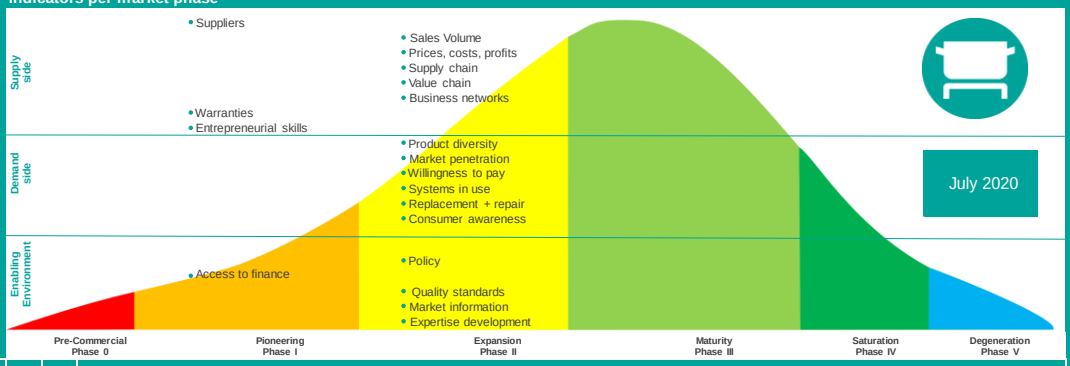


Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	Businesses continuing as much as possible and exploring alternative ways to deal with restrictions and protocols resulting from the COVID-19 situation. There are however challenges on importation of products resulting to stock-outs in some cases.
	S1V2	Business modalities	↗	↘	Companies continuing with existing models but at the same time looking at different/alternatives to overcome current challenges.
	S1V3	Formality	→	→	Some businesses closing down temporarily and permanently in some cases.
	S1V4	Jobs created	▯	↘	Companies reported operating with smaller teams in some cases and some of the comission based staff / agents put on hold.
S2 Sales Volume	S2V1	Products / services sold	↗	↘	Decline in sales reported.
	S2V2	Inventory turnover	↗	↘	Inventory turnover reduced by lower sales
S3 Prices, costs and profits	S3V1	Prices	↘	→	No changes reported so far
	S3V2	Costs	↘	▯	Companies implementing salary cuts, reduced field activitiy costs due to restrictions, but also introducing new cost categories (for instance use of online platforms and mass media advertising) will change in business approaches.
	S3V3	Profit margin	→	↘	No change in some overheads despite reduction in activities and sales and therefore reduced profit margins
	S3V4	Investments	→	↗	Delayed or postponed market development support from donors, but additional grants / funding being received in response to the COVID-19 situation.
S4 Supply chain and after-sales service	S4V1	Length	↗	→	No changes reported so far
	S4V2	Distribution channels	↗	→	Plans to expand distribution channels mainly on hold
	S4V3	Spatial reach	→	→	No changes reported so far
	S4V4	Initial suppliers	↗	→	No changes reported so far
	S4V5	After-sales service	→	↘	Reduced duting restriction movements
S5 Value chain	S5V1	Value added	↗	→	Implementation slow. Companies mainly operating with essential staff
S6 Business networks	S6V1	Networks	↗	↗	Traditional donor support on hold, delayed or postponed in some cases, but new networks supported with new COVID-19 response support / funding schemes.
	S6V2	Partnerships	→	→	Implementation on hold or going on at a very slow pace
S7 Warranties	S7V1	Warranties	↗	↘	Warranty admninistration affected by restrictions .
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	→	No change
	S8V2	Satisfaction level	↗	→	No change
	S8V3	Marketing skills	↑	→	No change
	S8V4	Advertising	↑	↗	Companies and donors investing more in adverstising to compensate reduced face to face marketing.
	S8V5	Production automatization	▪	▪	N/A
	S8V6	Standardized production	▪	▪	N/A
D1 Product diversity	D1V1	Diversity	↗	→	No change
D2 Market penetration	D2V1	Market penetration	→	→	No change
D3 Willingness to pay	D3V1	Willingness to pay	→	↗	Reduced with reported loss of jobs/ businesses and lower incomes.
D4 Systems in use	D4V1	Usage rate	↗	▯	Not measured
	D4V2	Maintenance	↑	→	No change
D5 Replacement and repair	D5V1	Replacement rate	▯	→	No change
	D5V2	Repair rate	▯	→	No change
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	Campanies creating awareness through alternative channels
	D6V2	Perception	↗	↗	Campanies creating awareness through alternative channels
E1 Policy	E1V1	National plans	↑	→	
	E1V2	Policy	↗	→	
	E1V3	Product taxes	↘	↓	Taxes fully re-introduced for solar systems
	E1V4	Business taxes	→	→	No change
E2 Access to finance	E2V1	Subsidies	↗	→	No change
	E2V2	Financing options suppliers	→	→	No change
	E2V3	Financing options consumers	↗	↗	Businesses providing more credit to the users
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	No change
	E3V2	Enforcement	→	→	No change
E4 Market information	E4V1	Cost of information	↗	→	No change
	E4V2	Market facilitation organizations	↑	→	No change
	E4V3	Awareness campaigns	↗	→	No change
E5 Expertise development	E5V1	Courses	↗	↘	Trainings put on hold due to restrictions
	E5V2	BDT	↗	→	No change
	E5V3	User training	↗	→	No change

Summary EnDev Market Scorecard: Kenya July 2020 Improved cookstoves

Market: Focus on improved biomass stoves focusing on formal and informal businesses and their respective markets

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↘	↘	So far there is no information that reveals that the companies have closed as a result of COVID-19 but it is quiet evident that business operations have significantly slowed down or almost grinding to halt due to the general unfavourable business environment brought about as a result of COVID-19.
	S1V2	Business modalities	↗	↘	The situation remains the same as at December 2019. No confirmed reports of situation retreating to pre-commercial as a result of COVID-19. Majority of the businesses are still single person or family owned, with reported lay offs for casual labor due to scaled down operations.
	S1V3	Formality	↗	↘	This situation has not changed from 2019 and it is unlikely that the exisiting formal companies will change to informal.
	S1V4	Jobs created	↗	↓	Gains made in job creation pre-COVID-19 are slowly being undone.There reported instances of job losses for both formal and informal ICS businesses as a result of significantly reduced business operations and sales due to directives put in place by the GOK to curb COVID-19.
S2 Sales Volume	S2V1	Products / services sold	→	↓	Majority of the businesses have reported reduction in sales and stoves production.
	S2V2	Inventory turnover	→	↓	Due to low sales, the inventory turnover is generally low for most of the businesses therefore resulting to dead stock and affecting stoves production/manufacturing especially for the informal sector.
S3 Prices, costs and profits	S3V1	Prices	↗	→	The pricing situation remains the same during the COVID-19 pandemic period. There is no reported increase or decrease in prices.
	S3V2	Costs	↗	↘	The cost of production has generally increased as a result of scaled down production/sales as well as increased cost of raw materials and transportation.
	S3V3	Profit margin	↑	↘	Due to increased cost of doing business and scaled-down sales turn-over/production, the profit margin has generally decreased.
	S3V4	Investments	↑	↘	Some formal businesses have reported reduction in investments opportunities and others indicating that some investment deals will either be delayed or postponed.
S4 Supply chain and after-sales service	S4V1	Length	↑	→	The situation remains as 2019, no changes reported on the supply chain other than reduced activities at the various distributions points (retailers and agents). The risks of ceasing operations for some retailers/ agents/ diferent points on the supply chain if COVID-19 situation persists is quite high.
	S4V2	Distribution channels	↑	→	The situation remains as 2019, no changes reported on the distribution channels other than reduced sales.
	S4V3	Spatial reach	↗	↘	GOK guidelines for COVID-19 response directly minimize movement and interactions which have ultimately hindered customer outreach. As a results, sales to customers have significanty reduced.
	S4V4	Initial suppliers	↑	→	The situation remains the same as 2019 except for the inconvenences posed by the COVID-19 pandemic that has stagnated the level of activities.
	S4V5	After-sales service	↑	→	The situation remains the same as 2019 except for the inconvenences posed by the COVID-19 pandemic that has stagnated the extend to which the services can be provided.
S5 Value chain	S5V1	Value added	↑	→	The situation remains the same as Dec 19
S6 Business networks	S6V1	Networks	↑	→	The situation remains the same as Dec 19
	S6V2	Partnerships	→	↘	Some partneships may be hampered because of the negative impact COVID-19 has had on business operations.
S7 Warranties	S7V1	Warranties	↑	→	The situation remains the same as Dec 19
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	→	The situation remains the same as Dec 19
	S8V2	Satisfaction level	↗	→	The situation remains the same as Dec 19
	S8V3	Marketing skills	↑	→	The situation remains the same as Dec 19
	S8V4	Advertising	↑	↘	Marketing activities have significantly reduced especialy grass-root marketing activities which have been prohibited due to restrictions on large crowds. Companies are also not spending on above the line marketing activities in public media. Social media seems to be the only channel that is still effective for advertisement.
	S8V5	Production automatization	↗	→	The situation remains the same as Dec 19
	S8V6	Standardized production	↗	→	The situation remains the same as Dec 19
D1 Product diversity	D1V1	Diversity	↑	↗	The situation remains the same and there is a positive outlook as far as product diversity is concerned.
D2 Market penetration	D2V1	Market penetration	↗	→	There has been reported drop in sales during COVID-19 which is expected to stagnate the penetration rate.
D3 Willingness to pay	D3V1	Willingness to pay	→	↓	The purchasing power of the consumers have reduced and their priorities have changed during the COVID-19 pandemic. Consumers are now focusing one essential goods and services hence this has affected their willingness to buy and pay for cookstoves
D4 Systems in use	D4V1	Usage rate	↗	→	The situation remains the same as at 2019. No major changes on usage rate anticipated during the COVID-19 pandemic
	D4V2	Maintenance	→	↘	Basic self maintenance will continue but where the services of technicians to provide maintenance is expected to reduce due to priorities of the consumers during the COVID-19 pandemic.
D5 Replacement and repair	D5V1	Replacement rate	→	↘	The replacement rate for stoves is expected to slow down due to decline in sales as a result of customers prioritied during the pandemic.
	D5V2	Repair rate	→	↘	Services requiring consumers to pay for repairs are also expected to reduce as a result of customers priorities during the pandemic.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↘	Awareness activities particularly field based activities have been significantly hampered due to government restrictions.
	D6V2	Perception	↗	→	The situation remains the same as Dec 19
E1 Policy	E1V1	National plans	→	→	The situation remains the same as Dec 19
	E1V2	Policy	↗	↑	The situation remains the same as Dec 19
	E1V3	Product taxes	↘	↘	ICS was VAT expted but VAT was reintroduced for ICS in 2020 during the reading of FY2020/21 budget. This was not a consequence of COVID-19 pandemic but rather government initiative to increase the tax collection. However, the standard VAT rate was reduced from 16% to 14% as a response of government measure to COVID-19.
	E1V4	Business taxes	↗	↗	The government reduced the income tax to 25% from 30% for corporations and for small SMEs the turn-over tax was reduced from from 3% to 1% of the turn-over.
E2 Access to finance	E2V1	Subsidies	→	→	The situation remains the same as Dec 19
	E2V2	Financing options suppliers	→	→	Financial institutions still view investments into ICS market as a risky venture, and now is affected even more by the circumstances around COVID-19. Firms/ business ability to service obligations is under stress (based on reduced activities) which affects their ability to access capital.
	E2V3	Financing options consumers	↗	→	The situation remains the same as Dec 19
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	The situation remains the same as Dec 19
	E3V2	Enforcement	▽	→	The situation remains the same as Dec 19
E4 Market information	E4V1	Cost of information	↑	→	The situation remains the same as Dec 19
	E4V2	Market facilitation organizations	↗	→	The situation remains the same as Dec 19
	E4V3	Awareness campaigns	↑	→	The situation remains the same as Dec 19
E5 Expertise development	E5V1	Courses	↑	→	The situation remains the same as Dec 19
	E5V2	BDT	↘	→	The situation remains the same as Dec 19
	E5V3	User training	↗	→	The situation remains the same as Dec 19

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Support MoE to coordinate the sector and to develop a **knowledge management and monitoring platform** to keep track on sector performance. • Support to **sector associations** in coordinating the sector, keeping track on sector performance and lobbying for government fiscal incentives (e.g. tax exemptions for solar and improved cooking solutions). • Support to **local county governments** to integrate clean cooking interventions in their development plans (complementing the GCF project). • Support development and awareness of **quality standards/ guidelines** for solar based PUE systems/solutions and alternative cooking fuels. • Advice to humanitarian agencies to address **energy needs in refugee settings.**
Supply side	• **Development of incentives** for accelerated growth of clean cooking in SI and SMEs, including in refugee settings. • Market development for **higher tier stoves** including promotion of innovations for the **mechanisation of stove production** and the production of good quality stoves in the informal sector. • Promoting emerging cleaner cooking options like **electric cooking** building on pilots already realised with CLASP. • Promoting **alternative cooking fuels** for households, SIs and SMEs. • Market development of **household clean/improved cooking and solar PUE solutions** including in refugee settings. • Capacity building for after sales services and **qualified technical support** for PUE solutions. • Market development for household solar home solutions for **basic electricity services in refugee settings**.
Demand side	• Economic empowerment and improvement of livelihoods through access to **PUE technologies and services for job creation and/or income generation**. • Awareness creation and incentives that stimulate demand for energy solutions for **Social Institutions** (particularly cooking solutions) and PUE solutions for SMEs. • **Awareness creation** on emerging clean cooking solutions, particularly electric cooking and alternative fuels. • Awareness creation and consumer education on household clean/improved cooking and solar solutions for **refugee settings.** • Promotion of **access to finance solutions** for PUE for SMEs and smallholder farmers and development of innovative finance models for higher tier cooking solutions in refugee settings through cash-based interventions.
Other	• Facilitate compliance of energy enterprises with government guidelines during the COVID-19 pandemic and mainstream **COVID-19 response measures** in the interventions and particularly on post-pandemic rebound measures.

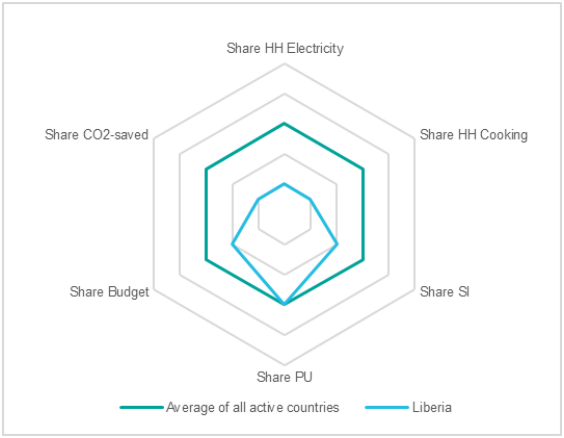
Liberia (with activities in Guinea and Sierra Leone)

Section 1: Key facts

Country facts	
Population	GIN: 12.4 million LBR: 4.8 million SLE: 7.6 million
HDI	GIN: 174 ↑ | Total (0.47) LBR: 176 ↑ | Total (0.47) SLE: 181 → | Total (0.44)
UN Classification	GIN: LDC LBR: LDC SLE: LDC
Access clean cooking	GIN: < 5 % LBR: < 5 % SLE: < 5 %
Access electricity	GIN: 44 % LBR: 26 % SLE: 26 %

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
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• Having been the **first clean energy project** in all three countries, EnDev is a key partner for sustainable energy access in three countries of the **Mano-River Union** (MRU) and has set out for cooperation to neighboring countries like Ivory Coast. • EnDev as key actor in **fostering the national and regional policy debates** on the nexus between sustainable energy access and other important development topics (deforestation, water scarcity, biodiversity degradation etc.) laying the ground for future clean energy markets. • EnDev plays an especially important role in **energizing sustainably the health sectors** and contributes to overcome health crisis like Ebola and COVID-19 (e.g. over 300 health and medical facilities equipped with solar power in 2020, with additional 400 clinics, wards or hospitals to follow, improving health care for some 3.8 million people. • EnDev to **follow up clean energy initiatives** of German bilateral projects (Health, TVET, Roads, EPP/Youth Employment, Biodiversity) when German bilateral cooperation with Guinee, Liberia and Sierra Leone will end by end 2023.
Contribution to paradigm shift	• Support to sector transition through a **holistic approach** (policy dialogue, "on-the-ground support to companies and projects, quality systems support, networking, support to international companies etc.) • Scaling through **regional networks and initiatives**, e.g. Mano River 2 conference together with World Future Council, Hivos, MRU Secretariat; Training of Parliamentarians, newly established Clean Cooking Alliance, Municipality Freetown. • Scaling through **innovative digitalization**: EnDev's ICT4Renewables initiative with maintenance and repair monitoring app, solar hotline; piloting solar curricula and e-learning, preparing digital marketplaces, tree satellite tracing, new website for Guinea. • Support to a range of **innovations with scaling potential**, e.g. e-mobility, new productive uses, large solar installations, energy saving building, improved mini-grids, repayment fund) and **higher tier access** (electricity, other fuels, pressure cookers, solar water heaters).
Important collaborations for scaling up	**Funding and investment** EnDev cooperates closely with a range of **international donors and NGOs investing in clean energy access** measures in the three countries e.g.: • **EU** plus Sida (support to renewable energies and grid expansion in **Liberia**; 40 million Euro) • **UNDP** (stove laboratory, tree planting, charcoal study and film; 7 million Euro) • **EU Guinea** (solar for schools and clinics, 0,7 million Euro)

	• **Welthungerhilfe** (WHH)-KfW (solar hospitals and laboratories, 3 million Euro) • **USAID/Power Africa**/WHH: solar project including securing training, monitoring, repair (0,5 million Euro) • **EU Sierra Leone**: planned cooperation to support clean energy in selected provinces, 10 million Euro
	Implementation • EnDev focuses on almost the entire "energy access" market in the three countries and not just on individual segments or individual players. Therefore, a **broad and diversified project structure** had been chosen for implementation through which the needs of many interlinked small markets and their specific growth can be met. • Collaboration to improve **framework and legal conditions** include Energy Regulators, the Mano River Union, Energy-, Health-, Education-, Environmental- and other Ministries, donors and NGOs. • Trainings, including parliamentarians, are focusing beyond solar and RE on cooking energy and related **nexus problems**: water, biodiversity, climate, income, investment, charcoal production, reforestation etc. • Important donors in the three countries like the WB, the EU, UN organisations, GEF and Irena and GIZ projects look regularly for cooperation with EnDev to **support their project operations**.
	Knowledge sharing and learning • Having been the first energy access project in the region and having acquired substantial field experiences the project acts as a **central catalyst**, contact, trustee, knowledge pool and partner for governments, private sector, donors, customers and NGOs. • EnDev **exchanges regularly** with the private sector, banks, EU, UNIDO, FCDO, churches, NGOs, Green Climate Fund, UN organizations, Embassies, ROGEP, USAID, ACE, Swedish Embassy, AECF, REEEP, WCS, KfW, WHH, AfdB, MCC and a range of NGOs. • EnDev **facilitates information sharing and networking** through meetings and through digital platforms (e.g. *www.renewables-liberia.info; www.renewables-salone.info ;* soon *-guinee.info*).
Gender	A **gender analysis** had not been carried out yet, however, EnDev puts a focus on including and supporting women in its operations: • (i) EnDev demands **50% women quota** in training and support women to organize Renewable Energy Organizations (WIRE, a.o.), presently finances a 3-year training to 60 women students for renewable energy, works intensively with 2 girls' groups in Freetown. • (ii) Support to **Africa WISE/AU** including conference, backing solar lamp donations to schoolgirls with NGOs, private sector and President support (Sierra Leone).

Consideration of ITAC recommendation

Cooperation with partner organisations: Regular consulting with ROGEP, UNDP, EU, WB, USAID, FCDO, Swedish Aid, WCS, UN Coordination, WHH, Future Council, MRU, KfW, NGOs, private sector organizations, financing agencies and others to collaborate, coordinate and create synergies and make projects and investments work. For these agencies EnDev is an important technical partner on the ground to supervise, improve and secure implementation of projects jointly with the private sector. Also, EnDev is often instrumental in ensuring necessary follow-up once donor projects come to an end.

Operation and Maintenance: For effective and sustainable Operations and Maintenance, a range of approaches and techniques are used and constantly improved jointly with partners; this includes (i) set up of a Maintenance and Quality Association including a maintenance fund; (ii) the refinement of technical supervision, labelling and instructions for O&M; and (iii) provision of data from EnDev's ICT4Renewables app for remote monitoring, maintenance and repair of solar systems, which proved to be essential given the high transport costs in the three countries.

Regional expansion & contacts: EnDev provides actively advise and support on regional expansion beyond national borders to a large number of companies for the different sub-sectors: transportation, storage, mini-grids, large solar, training. International companies are supported to approach Mano River countries as one integrated market (e.g. Sunlabob, Phaesum, Solar Suppliers), EnDev having a role as door opener and multi-functional catalyst.

Catalizing funding: EnDev country teams are working with national banks to support credits to RE companies (Sierra Leone) and with regional and international banking institutions (AfDB, KfW); EnDev is catalyzing additional project funding from Sweden (Liberia), Britain (FCDO), America (USAID Sierra Leone and Liberia), World Bank (Liberia) and EU (Guinee, Sierra Leone, Liberia).

Policy advocacy & cooperation: National political sensitization and cooperation on clean energy and climate change issues is improving. EnDev is wanted partner and in the right position to help to convene and too often add practical and action-oriented knowhow, equipment, manpower and experience.

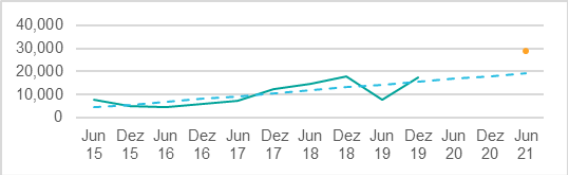
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

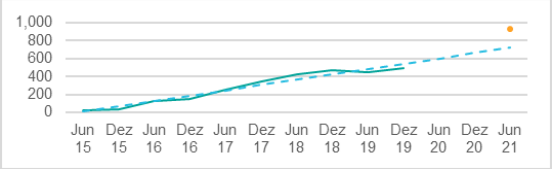
HH Access Cooking

Target: 28,700 Achieved: 17,494



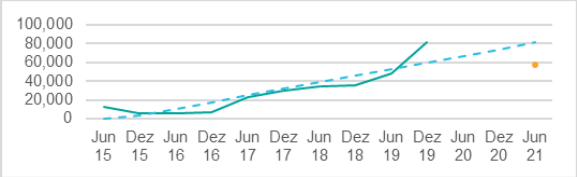
SI Access

Target: 935 Achieved: 499



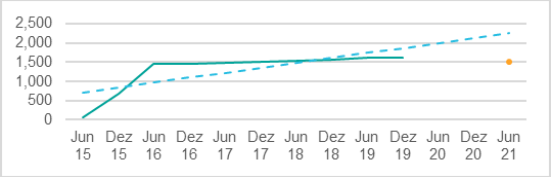
HH Access Electricity

Target: 57,000 Achieved: 81,628



PU Access

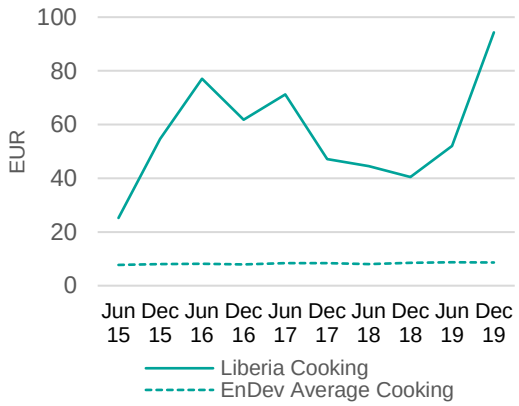
Target: 1,520 Achieved: 1,609

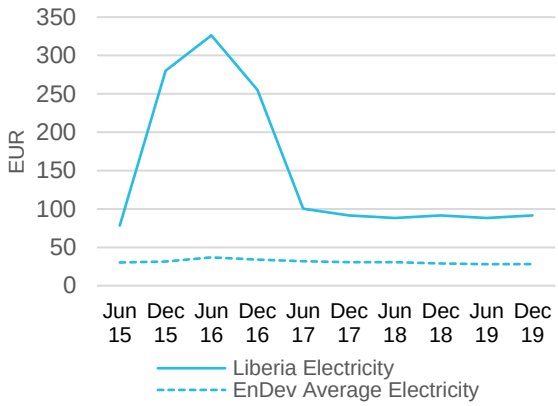


Additional info

- Due to COVID-19, **SI Access** activities have focused on health institutions, partially as well on schools. Since the beginning of 2020 the project put additional efforts on the electrification of 300 health care facilities as a quick COVID-19 response measure; these achievements are neither visible in the figures nor in the trend, yet. Implementation is still speeding up.
- **HH Access Cooking** development slowly but steadily, current sensibilization and dialogue on political level to see improved cooking as a key for environmental problems is expected to lead to higher dynamics in the ICS market in the medium-term.

Efficiency





Additional info

- Decreasing **cost-efficiency in the cooking sector** in 2019 due to a number of activities to raise awareness and contribute to the political discussion on the benefits of clean cooking in the three countries (e.g. charcoal study, deforestation video, conference with energy ministry towards clean cooking policy, support to lab for testing stoves, support to cross-border export and cooperation).
- In Sierra Leone the established "**Task force multi-institutional Peninsula Freetown**" contributed to higher costs but will explore in an exemplary way cooking energy options and ways to address related environmental challenges related to deforestation and inefficient cooking (water scarcity, degradation of biodiversity etc.).
- During starting phase of EnDev in the three countries (2014-2016) high costs for setting up structures in the **electricity sector**; meanwhile support structures and systems in place, however, still slightly higher costs in comparison with EnDev average in the electricity sector are due to (i) increasing support to sustainable electricity access through e.g. reliable maintenance and repair systems; and (ii) EnDev's ICT4Renewables activities for the three countries through which synergies, knowledge sharing, learning, sector networking and transparency are supported.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity sector

The solar markets are developing in all three countries positively but still slowly. In Guinee a focus is put on social institutions. In this country picoPV and SHS systems still often lack sufficient quality and sustainable maintenance structures. In Liberia quality of staff is much better and thus systems offered by the private sector have a better quality and reputation. Here, the market starts to take off slowly including PAYGO. Systems between 500 Watt and 5 KW but in some cases even up to 50 KW for private owners are set up. Especially in the health sector solar is increasingly turning into standard and with high quality even for large systems. There is a similar development in Sierra Leone where diversification is most visible with a strong focus on PAYGO, min-grids, productive uses, health, charging stations, larger units and a range of other application for the private and public sector. In all countries, larger solar projects in the Mega Watt range are in preparation but take longer to establish. Political discussion and donors focus is increasingly on solar for different ranges. EnDev support to private sector organizations and local NGOs contribute to the professionalisation of market actors. However, most markets still need further support on different levels, but as well show increasing signs of independence and sustainability.

Cooking sector

The market for ICS also develops slowly, and only in Sierra Leone with real dynamics so far. The political discussion on clean cooking supported by EnDev contributes to a raising understanding of key stakeholders and the societies in the countries of the complex impacts on environment and development caused by inefficient cooking. It is expected that with further sensibilisation and policy dialogue markets for ICS will be positively influenced and pick-up in the medium run.

Impact of COVID-19 pandemic

Increasing costs and low incomes are slowing down demand and markets during the COVID-19 pandemic. Support to a range of technical innovations – especially for PU – is equally slowing down during the pandemic, e.g. on e-mobility now starting in Liberia, solar water heaters, improved batteries, single cell battery metering, container solutions, transmitters for small system failures, improved food storage, other cooking techniques and sources, charging stations, new business models, energy efficient (green) building; likewise, set up women empowerment schemes are effected and cannot implemented at the pace foreseen.

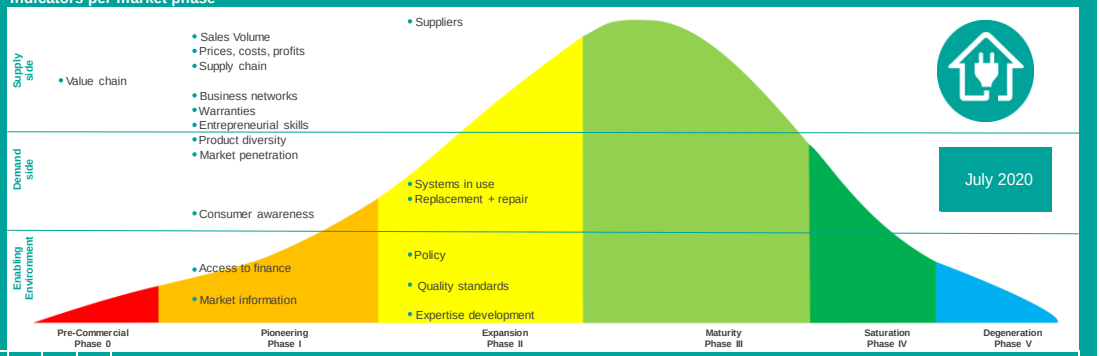
Summary EnDev Market Scorecard: Liberia July 2020 Solar Products

Market: Solar products (Pico PV, SHS, solar charging stations etc.), solar service providers (installers, mini-grid etc.)

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↑	↘	↗	Due to expected subsidy schemes
	S1V2	Business modalities	↑	↘	→	
	S1V3	Formality	↑	→	→	
	S1V4	Jobs created	↗	↗	↓	4 or 5 businesses with more employees, but mostly businesses operate with people on commissions, and currently hardly any business activity
S2 Sales Volume	S2V1	Products / services sold	↑	↗	↓	Due to lock-down and increasing economic problems activities have slowed down
	S2V2	Inventory turnover	↑	↗	↓	slow
S3 Prices, costs and profits	S3V1	Prices	↗	→	→	
	S3V2	Costs	↑	→	→	still relatively high due to low volumes
	S3V3	Profit margin	↑	→	→	small
	S3V4	Investments	↑	↗	→	Examples of investments? Most businesses are too small and have hardly any capital
S4 Supply chain and after-sales service	S4V1	Length	↑	▪	→	
	S4V2	Distribution channels	↑	→	↘	Due to Covid-19, movements between counties have been restricted.
	S4V3	Spatial reach	→	→	→	slowly improving
	S4V4	Initial suppliers	↗	→	→	
	S4V5	After-sales service	↗	↘	↘	warranties due to projects or products, probably many after-sales services rather provided if payed for
S5 Value chain	S5V1	Value added	↗	→	→	
S6 Business networks	S6V1	Networks	↗	↗	→	Liberia Energy Access Practitioner (LEAP) network, set up mainly by donors, is still weak
	S6V2	Partnerships	↑	↗	→	any examples?
S7 Warranties	S7V1	Warranties	↑	↗	→	
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	→	→	
	S8V2	Satisfaction level	↑	→	↓	Corona related
	S8V3	Marketing skills	↗	→	→	
	S8V4	Advertising	↗	→	→	Corona has slowed down activities
	S8V5	Production automatization	↗	▪	▪	
	S8V6	Standardized production	↑	↗	▪	
D1 Product diversity	D1V1	Diversity	↑	↗	→	Corona has stopped diversification processes.
D2 Market penetration	D2V1	Market penetration	↑	↗	↗	
D3 Willingness to pay	D3V1	Willingness to pay	↑	→	↓	Due to increasing financial hardships with lock-down etc.
D4 Systems in use	D4V1	Usage rate	↑	→	→	No change visible
	D4V2	Maintenance	↗	→	↑	Maintenance has improved for social institutions.
D5 Replacement and repair	D5V1	Replacement rate	↗	↗	↑	Replacement of faulty parts has increased considerably.
	D5V2	Repair rate	↗	↗	↑	A systematic monitoring and repair approach was rolled out and implemented.
D6 Consumer awareness and perception	D6V1	Awareness	↑	↗	↘	During Corona energy awareness was not priority.
	D6V2	Perception	↑	↗	→	Some consumers have bad experience with cheap material and/or unqualified installers.
E1 Policy	E1V1	National plans	↑	→	→	Regulator has a new head, former Head of renewable energy agency, allowing to expect a more comprehensive and joint national planning.
	E1V2	Policy	↑	→	→	Actual policy is erratic with a president not being very aware of the issues at stake.
	E1V3	Product taxes	↑	→	→	There is a waiver on product taxes only where application procedures are exactly met.
	E1V4	Business taxes	↗	→	→	No specific business support
E2 Access to finance	E2V1	Subsidies	↗	↗	↘	Support and subsidy schemes are being set up on an encouraging scale.
	E2V2	Financing options suppliers	↑	↑	→	Regular financing remains one of the week spots of activities
	E2V3	Financing options consumers	↑	↓	→	PAYGO introduced for few producers
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	↗	↗	Liberian Electricity Regulatory Commission (LERC) has been set up slowly starting operating. EnDev contributed to discussing and improving off-grid and on-grid electricity regulation.
	E3V2	Enforcement	↑	→	→	one week point in Liberia
E4 Market information	E4V1	Cost of information	↑	→	→	www.renewables-liberia.info, getting updates from various stakeholders, private sector can place infos for free
	E4V2	Market facilitation organizations	↑	→	→	Rural and Renewable Energy Agency (RREA) and Liberian Electricity Regulatory Commission (LERC), strongly supported by donors and projects, associations slowed down during Corona
	E4V3	Awareness campaigns	↑	↘	→	Current focus of awareness campaigns is health related.
E5 Expertise development	E5V1	Courses	↑	→	↗	Courses in country on irregular level; offer of international webinars reaching Liberian technicians could be increased but participation rate from Liberians still limited since technical skills often high.
	E5V2	BDT	↑	↗	↑	USAID program providing technical assistance to 8 companies. Stagnation due to Covid-19
	E5V3	User training	↑	→	↗	User training done with installations on different and increasing levels of intensity. EnDev always does user training.

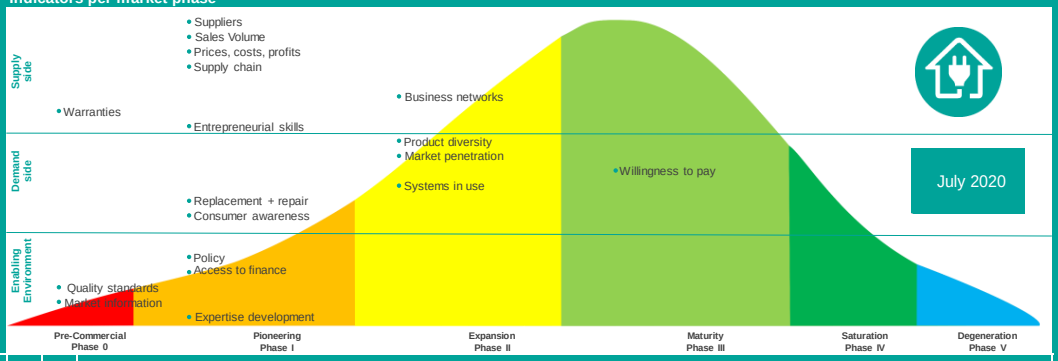
Summary EnDev Market Scorecard: Guinea July 2020 Solar Home Systems

Market: The solar home system market started on a good basis in 2019 as more and more small and medium sized companies have entered this sector and have even formed a network of professionals to create synergy. This has allowed to diversify solar services and products on the local market.
With the advent of the COVID-19 pandemic, the market experienced a strong slowdown with a drastic reduction in the activities of Small and Medium Enterprises.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	→	→	
	S1V2	Business modalities	↗	↘	COVID does not encourage the private sector at the moment
	S1V3	Formality	→	→	
	S1V4	Jobs created	↗	↘	turnover has reduced
S2 Sales Volume	S2V1	Products / services sold	↗	↘	Inquiries and planning still on
	S2V2	Inventory turnover	↗	↘	mostly very slow again
S3 Prices, costs and profits	S3V1	Prices	→	→	prices are lower than in other Mano River countries.
	S3V2	Costs	→	→	costs are high due to small market, low since borders are very open to Asian products
	S3V3	Profit margin	→	↓	very diverse
	S3V4	Investments	→	↗	investors for larger projects trying to come on board
S4 Supply chain and after-sales service	S4V1	Length	→	→	
	S4V2	Distribution channels	↓	↓	have deteriorated due to Covid
	S4V3	Spatial reach	→	↘	This is due to the isolation of much of the country because of COVID-19
	S4V4	Initial suppliers	→	→	small numbers
	S4V5	After-sales service	→	↗	very diverse according to company
S5 Value chain	S5V1	Value added		→	still limited
S6 Business networks	S6V1	Networks	↗	↗	improving by integrating Guinee into Mano River activities and increasing cooperation with French speaking neighbours
	S6V2	Partnerships	↗	→	regional and international slowly coming
S7 Warranties	S7V1	Warranties	→	↗	increasingly asked for by customers for SHS and plug-ins
S8 Entrepreneurial skills	S8V1	Financial literacy	→	→	very diverse within the members of the solar association
	S8V2	Satisfaction level	→	→	with covid small satisfaction level has taken a further blow
	S8V3	Marketing skills	↗	↗	companies getting more professional
	S8V4	Advertising	↗	↗	Platform for advertisement being built
	S8V5	Production automatization		▽	only standardized installation and monitoring
	S8V6	Standardized production		▽	only standardized installation and monitoring
D1 Product diversity	D1V1	Diversity	↑	↗	More products are offered on the market
D2 Market penetration	D2V1	Market penetration	↑	↗	Products gain increasingly respect for their quality in the market
D3 Willingness to pay	D3V1	Willingness to pay	→	→	Lack of purchasing power, in particular during COVID-19
D4 Systems in use	D4V1	Usage rate	↗	→	no change
	D4V2	Maintenance	↑	↗	maintenance is improving
D5 Replacement and repair	D5V1	Replacement rate	↑	↗	replacement is improving
	D5V2	Repair rate	↗	↗	more repairs since attention is increasing here
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	some additional awarenes measures
	D6V2	Perception	↗	↗	
E1 Policy	E1V1	National plans	→	→	little political movements due to election, Covid, political twist
	E1V2	Policy	↗	→	policy is not beeing implemented
	E1V3	Product taxes	↗	→	no change
	E1V4	Business taxes	→	→	no change
E2 Access to finance	E2V1	Subsidies	↗	↗	there are some donors willing to spend money in the sector and subsidized systems
	E2V2	Financing options suppliers	↗	↗	there are few additional financing options
	E2V3	Financing options consumers	→	→	none
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	→	→	discussion only in the private sector, not yet on public level
	E3V2	Enforcement	→	→	no enforcement in the sector
E4 Market information	E4V1	Cost of information	→	↑	there is a website being built
	E4V2	Market facilitation organizations	↑	↗	some organisational efforts in the private sector, association
	E4V3	Awareness campaigns	↗	↗	some public awareness being organised
E5 Expertise development	E5V1	Courses	↗	↗	few training courses being organized
	E5V2	BDT	↗	↗	
	E5V3	User training	↑	↗	user training is regular part of installation

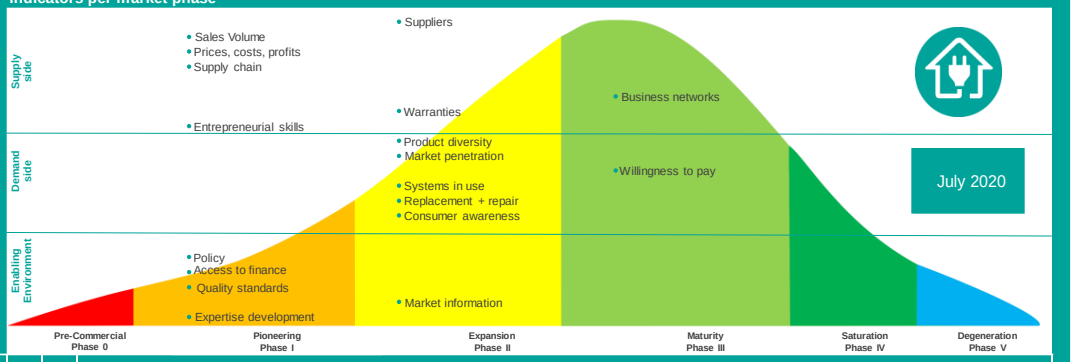
Summary EnDev Market Scorecard: Sierra Leone July 2020 Solar Home Systems

Market: The solar home system market started on a good basis in 2019 as more and more small and medium sized companies have entered this sector and have even formed a network of professionals to create synergy. This has allowed to diversify solar services and products on the local market.
With the advent of the COVID-19 pandemic, the market experienced a strong slowdown with a drastic reduction in the activities of Small and Medium Enterprises.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase

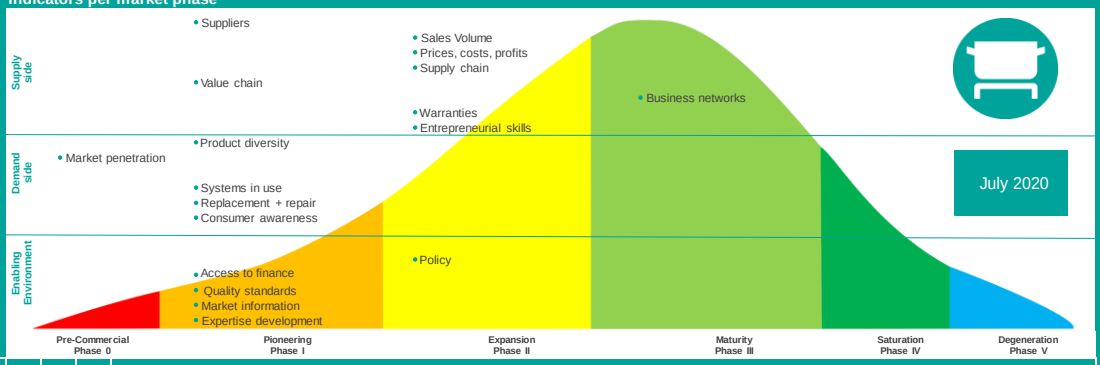


Indicators	Variables		Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	→	The impact of COVID-19 on the companies was relatively small so far even though the reduction of turnover has brought some to their limits; some companies however have rather expanded their business.
	S1V2	Business modalities	↘	↘	
	S1V3	Formality	→	→	In cooperation with the Ministry of Energy a number of additional rules could be established in particular in the mini-grid sector.
	S1V4	Jobs created	↗	↗	The market is growing due to a number of companies expanding.
S2 Sales Volume	S2V1	Products / services sold	↗	→	Some companies lost business and sales, for others business is growing during the Covid-19 pandemic.
	S2V2	Inventory turnover	↗	→	slow turnover
S3 Prices, costs and profits	S3V1	Prices	→	→	prices are partially increasing since import became more expensive
	S3V2	Costs	→	→	the costs are increasing as well due to shortage of materials, equipment
	S3V3	Profit margin	→	→	the profit margin is monstly low
	S3V4	Investments	↗	↘	Few companies are expanding and investing
S4 Supply chain and after-sales service	S4V1	Length	→	→	increasingly complex
	S4V2	Distribution channels	↓	↗	diverse developments, partial improvement
	S4V3	Spatial reach	↘	↗	This is due to the isolation of much of the country because of COVID-19
	S4V4	Initial suppliers	↗	↗	establishing firmly on the market
	S4V5	After-sales service	→	↗	improving visibly
S5 Value chain	S5V1	Value added	↑	↗	improving due to different applications and loads
S6 Business networks	S6V1	Networks	↗	↑	Companies and technicians are better networked between each other.
	S6V2	Partnerships	↗	↗	Partnerships getting more stable with less subsidies being granted.
S7 Warranties	S7V1	Warranties	↗	↗	Warranties become professional standard being requested by customers.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	↗	some financing options being offered
	S8V2	Satisfaction level	↗	↗	unknown
	S8V3	Marketing skills	↗	↗	unknown, not very elaborated
	S8V4	Advertising	↗	↗	few companies do very professional advertising
	S8V5	Production automatization		▽	not applicable
	S8V6	Standardized production		▽	some marketing and operating strategies are being increasingly professionalized
D1 Product diversity	D1V1	Diversity	↗	↑	Range of available products visibly increasing
D2 Market penetration	D2V1	Market penetration	↗	↑	Solar becomes a standard product on some markets.
D3 Willingness to pay	D3V1	Willingness to pay	↗	↑	professional payment schemes established for some vendors
D4 Systems in use	D4V1	Usage rate	↗	↑	the range of available loads and their useful application is increasing
	D4V2	Maintenance	↑	↑	maintenance is increasingly discussed, professionalized and service offered
D5 Replacement and repair	D5V1	Replacement rate	↗	↑	Worn parts are increasingly replaced
	D5V2	Repair rate	↗	↑	Repairs are demanded by more stakeholders
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	Consciousness on relevance of solar is increasing.
	D6V2	Perception	↗	↗	some installations are seen increasingly as show cases
E1 Policy	E1V1	National plans	↑	↗	Discussion to forward the agenda is ongoing with government and donors.
	E1V2	Policy	↑	↗	there is a positive attitude towards renewables in the key ministries
	E1V3	Product taxes	↑	↑	for the key products there is only a low tax range; REASL organizes tax waivers
	E1V4	Business taxes	→	→	nothing has changed here
E2 Access to finance	E2V1	Subsidies	↑	↗	the amount of subsidies is relatively low
	E2V2	Financing options suppliers	↑	↗	fananing is still an issue, but some offers on the market
	E2V3	Financing options consumers	→	→	none
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	↗	dicussion on improved rules is ongoing
	E3V2	Enforcement	→	→	close to none
E4 Market information	E4V1	Cost of information	↑	↗	information can be found on websites, seminars, associations
	E4V2	Market facilitation organizations	↑	↗	the organizations give some but insufficient support to private sector
	E4V3	Awareness campaigns	→	↗	solar campaigns were largely slowed down during COVID-19
E5 Expertise development	E5V1	Courses	↑	↑	training has slowed down during COVID-19
	E5V2	BDT	↑	↗	
	E5V3	User training	↑	↑	Is standard for installations in the vicinity of EnDev

Summary EnDev Market Scorecard: Liberia, Sierra, Guinea July 2020 Improved cookstoves

Market: Locally produced ICS (mainly "Red Fire Pots", few institutional stoves), few imported ICS

Indicators per market phase



Market trends

Positive ↑
Slight positive ↗
Stagnation →
Slight negative ↘
Negative ↓
Conflicting ↔
Unknown ▽
Not measured ▯
Doesn't apply ▪

Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	↗	number of business increasing on low scale
	S1V2	Business modalities	↗	↗	↗	Some businesses are full time and professional, some at early stages.
	S1V3	Formality	↗	↗	↗	
	S1V4	Jobs created	↗	↓	↘	Very few businesses with several people working there, mostly not formally employed but getting paid from what they produce.
S2 Sales Volume	S2V1	Products / services sold	↗	↓	↗	Due to lock-down and increasing economic problems, reduced business activities, few new initiatives, services and products sold
	S2V2	Inventory turnover	↗	↓	↗	few business still advancing even during COVID-19 pandemic in SL
S3 Prices, costs and profits	S3V1	Prices	↗	→	→	
	S3V2	Costs	↗	→	↘	scrap metal getting rare, costs rising
	S3V3	Profit margin	↗	→	→	
	S3V4	Investments	↗	→	↗	two factories and workshops completed and brought into operation
S4 Supply chain and after-sales service	S4V1	Length	↗	→	↗	positive for some companies only
	S4V2	Distribution channels	↗	↘	↗	Due to Covid-19, movements between counties have been restricted but additional transport facilities made available.
	S4V3	Spatial reach	→	→	↗	one company expanding well in SL
	S4V4	Initial suppliers	↗	→	→	
	S4V5	After-sales service	↗	↘	↗	warranties due to projects or products, probably many after-sales services rather provided if payed for
S5 Value chain	S5V1	Value added	↗	→	↗	
S6 Business networks	S6V1	Networks	↗	→	↑	regional cooperation between 4 countries, cookstove alliance created
	S6V2	Partnerships	↗	→	↑	
S7 Warranties	S7V1	Warranties	→	→	↗	
S8 Entrepreneurial skills	S8V1	Financial literacy	→	→	↗	agreement with bank
	S8V2	Satisfaction level	↗	↓	→	
	S8V3	Marketing skills	↗	→	↗	broader marketing net
	S8V4	Advertising	↗	→	↑	new adds, new marketing manager
	S8V5	Production automatization	↗	→	→	preparation for partial production of parts in China
	S8V6	Standardized production	↗	→	→	modernized factory and production site
D1 Product diversity	D1V1	Diversity	↗	→	→	
D2 Market penetration	D2V1	Market penetration	↗	↗	↗	
D3 Willingness to pay	D3V1	Willingness to pay	↗	→	↓	Due to increasing financial hardships with lock-down etc.
D4 Systems in use	D4V1	Usage rate	↗	↗	→	
	D4V2	Maintenance	↗	→	→	
D5 Replacement and repair	D5V1	Replacement rate	↗	→	→	
	D5V2	Repair rate	↗	→	→	
D6 Consumer awareness and perception	D6V1	Awareness	↗	↘	↘	
	D6V2	Perception	↗	→	→	
E1 Policy	E1V1	National plans	↗	→	↗	Cooking energy in Rural Energy Strategy and Master Plans
	E1V2	Policy	↗	→	↗	some strong policy moves on regional and national levels
	E1V3	Product taxes	↑	→	→	
	E1V4	Business taxes	↗	→	→	
E2 Access to finance	E2V1	Subsidies	↗	→	→	
	E2V2	Financing options suppliers	↗	→	↗	bank pays transport loan
	E2V3	Financing options consumers	→	→	→	
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	↗	Test Lab being prepared, Standard office involved
	E3V2	Enforcement	↗	→	→	
E4 Market information	E4V1	Cost of information	↗	→	→	www.renewables-liberia.info, getting updates from various stakeholders is difficult
	E4V2	Market facilitation organizations	↗	→	→	
	E4V3	Awareness campaigns	↑	↗	↗	
E5 Expertise development	E5V1	Courses	↗	→	→	no regular courses in country
	E5V2	BDT	↗	↘		
	E5V3	User training	↗	→	→	

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Strengthening political support to EnDev's clean cooking agenda through **continued policy dialogue** and development of a more profound understanding of the nexus between deforestation, water shortage, employment, food shortage and health with clean cooking. • **Cooperation with regional organizations** like the Mano River Union, ECREE and ECOWAS to harmonize standards and procedures for investments, imports and technical norms as well as for subsidy schemes in the clean energy market. • Continued support to the **sector associations** in the three countries (Renewable Energy Associations; Maintenance Association, Clean Cooking Alliance and Peninsula Working Group in Sierra Leone) to increase their political influence.
Supply side	• Support to **international investor and supplier companies** to become increasingly active, confident and interested in the Mano River markets. • Strengthening **product quality systems** to make products offered by companies on Mano River markets increasingly trustworthy, viable and trusted by customers. • Support to develop **quality services** and maintenance for social institutions and in the increasing market of high quality and larger solar products and mini-grids installed and managed by local companies. • Support to development and marketing of **improved cooking devices**, including larger, higher-tier coal, wood, pellets, electrical solar and gas stoves. • **Harmonizing capacity development** in the three countries through cooperation with key training institutions, TVET projects and international suppliers developing e-learning tools and contents and introducing increasingly a binding setting of quality standards for manpower, installations, trainings and materials.
Demand side	• Further **awareness building** of society and customers for relevance and economic advantages of sustainable energy and the positive impact of ICS on health, water supply and environment. • High potential to support technical solutions for **mini-grid development** which are now regarded by Governments and many customers as a respected alternative and viable option with large range of applications. • Support availability of specific equipment requested by customers to use **renewable loads** for comfort and income source. • Potential for **enlarged regional markets** through further support to regional cooperation e.g. with Ivory Coast (cooperation with Green People's Energy project), Senegal, Benin (both with EnDev projects), Gambia, other.

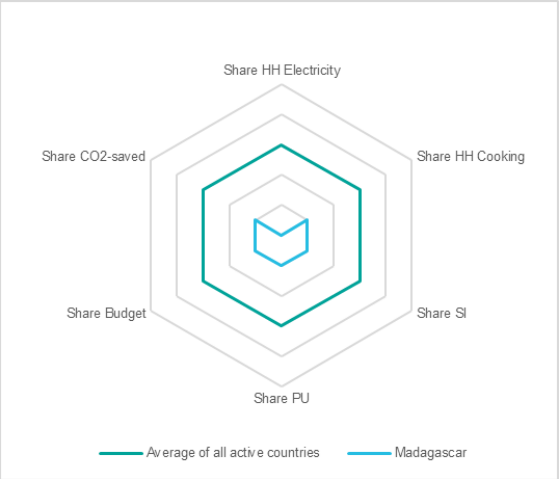
Madagascar

Section 1: Key facts

Country facts	
Population	26.9 million ↑
HDI	162 ↑ | Total (0.52)
UN Classification	LDC
Access clean cooking	< 5 % urban < 5 % rural
Access electricity	26 % urban & rural

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
Implementer	ADES,
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev/ADES interventions in line with the **national energy and climate policies** (*La nouvelle Politique de l'Energie 2015-2030/NDCs;* target of 70% access to energy-efficient cookstoves until 2030). • Inefficient usage of charcoal (urban and peri-urban areas) and wood (rural areas) endangers severely **health and environment** (deforestation). • Due to high population growth, affordability constraints and artisanal production **clean cooking access remains a major challenge.** • Especially high relevance of EnDev in the **development of a semi-industrial sector** of ICS (focus: ICS for wood and charcoal; solar cockers as complement) which is still at a nascent stage. • High relevance of the **commercial approach** of ADES through which ICS production capacities are developed; other projects focus on capacity building (GIZ) or specific fuels like ethanol (World Bank's Carbon Initiative for Development).
Contribution to paradigm shift	• ADES as the most **prominent actor** in the semi-industrial ICS sector in Madagascar has the potential to contribute substantially to further growth of the sector. • ADES has reached a **high market penetration** (2-4% of households) through product and target group differentiation and market channel development; total ICS sales developed in nearly a decade from zero to more than 250.000. • ADES contributes to further exponential **growth and market development** by expanding (i) its local ICS production capacities (installation of a second kiln), (ii) its distribution channels (introduction of mobile promotion and sales centres to reach last-mile costumers) as well as (iii) its network of (mostly female) resellers. • New scaling up approaches include the development of **innovative pricing and financing models** to reach the bottom of the income pyramid in order to expand the market more rapidly and to leave no one behind. • Higher tier ICS access is promoted through the testing and development of **new, innovative stoves** which enable households e.g. to use one stove for both fuels wood and charcoal • Piloting of new, **holistic ICS solutions for school kitchens** with potential for up-scaling.

Important collaborations for scaling up	**Funding and investment** ADES finances (apart from EnDev's contributions) large parts of its subsidized ICS sales through the **carbon financing** mechanism (GCF; roughly 1 million €/year); negotiations with international carbon finance certificate broker organisations (myclimate and a second organisation) are in process for the new carbon finance period 2022 – 2028 through which a long-term perspective will be ensured.
	Implementation To promote ICS sales ADES cooperates with a large range of national and international institutions and organisations. New partnerships have been established in the northern and north-eastern regions with **nature conservation organisations**, namely: • Lemur Conservation Foundation (1500 ICS per year) • Givaudan Foundation (7 vanilla and clove villages from 2021 onwards) • Duke Lemur (500 ICS per year) • Zoo Zürich and Wildlife Conservation Society (500 ICS for 2019) • Near Mahajanga ADES works with Eden Reforestation one of the largest reforestation projects in the world (solar cookers and ICS). In cooperation with these organizations **new financing models** were developed, for example ICS for work in protected areas (beneficiaries living in or close to protected areas contribute to afforestation work and receive for this work an ICS).
	Knowledge sharing and learning ADES intensifies the cooperation with **Solar Cooking International** and has been nominated as a global advisor for similar projects worldwide (https://www.solarcookers.org/).
Gender	Female empowerment is an **important element within the ADES strategy**. Nearly 70% of the management of the ICS sales centres is done by women and over 50% of the resellers are women. Further gender-specific impacts and possible measures are being assessed in a gender analysis which had, however, to be postponed due to COVID-19.

Consideration of ITAC recommendation

Cooperation with World Bank: A meeting with the World Bank took place in order to discuss how best to promote clean cooking in the country and identify areas of collaboration. The World Banks will focus its support on the promotion of ethanol as fuel for clean cooking, which is not considered by ADES to be a strategically right choice to support clean cooking in Madagascar. However, exchange is expected with regard to the professionalisation of the artisanal production of ICS.

Policy advocacy: A meeting with the Ministry of Energy of Madagascar took place. The Ministry emphasised the importance of high-quality ICS products and highlighted the role of ADES in promoting such products. However, work on setting quality standards for the ICS sector initiated in the past could not be followed up due to other priorities of the ministry at that time. Further exchange is planned but on hold for the time being due to COVID-19.

Affordability and Scale/collaboration with MFIs and other entities: Affordability of ICS is a huge barrier for many households in Madagascar. ADES is currently exploring different price models and approaches similar to cash-for-work ("work gets you a stove") to leave no one behind. Active collaboration with MFIs has not been perused yet. First talks were initiated in 2019 with the local organisation Tsinjo Aina. They initiate savings groups that can help each other out with interest-free loans in emergencies.

Develop gender capacities and a gender mainstreaming strategy and action plan: A gender analysis was planned but postponed due to COVID-19. The gender analysis will be used to formulate gender specific goals and strategies for the work of ADES in Madagascar.

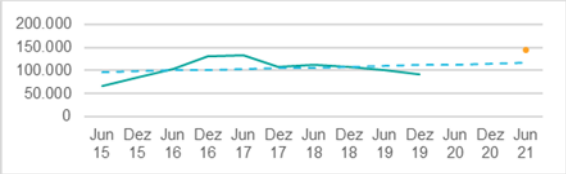
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

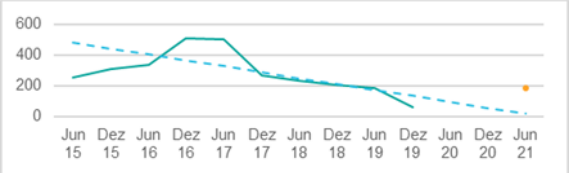
HH Access Cooking

Targets: 145,000 Achieved: 91,471



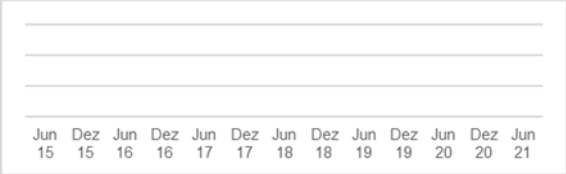
SI Access

Targets: 185 Achieved: 61



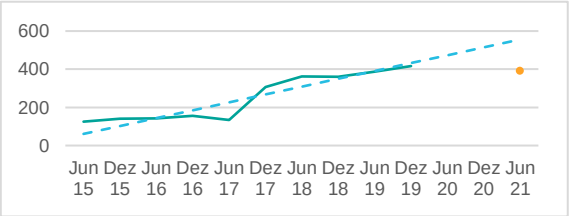
HH Access Electricity

Targets: 0.0 Achieved: 0.0



PU Access

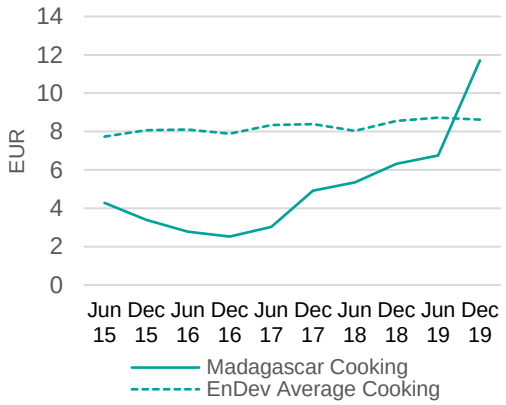
Targets: 390 Achieved: 417

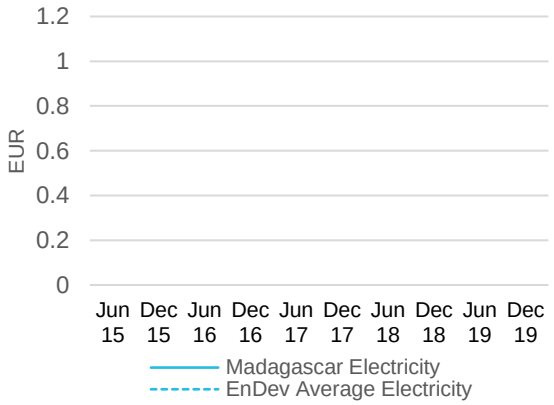


Additional info

- In 2019, progress towards target achievements for **households and social institutions** slowed down slightly. The reason for this decrease was the introduction of a VAT of 20 % on ADES ICS products by the government, which had to be added to the sales prices. As a result, sales stagnated for some months (especially in the first half of 2019), while in the second half of 2019 they slowly recovered.
- In 2020 progress in **ICS sales** was remarkable until April but started to stagnate as a result of COVID-19 and the associated restrictions. Nevertheless, sales figures (as of July) in 2020 are still above the results of 2019 (Sales 20/07/2019: 19,077 vs. sales 20/07/2020: 23,443).
- **SI Access** figures are expected to raise soon as new “customized institutional cooking” solutions are under final testing; among others such solutions will be soon installed in selected schools.

Efficiency





Additional info

- The introduction of a VAT of 20 % on ADES ICS products by the government in 2019 led to a lower **cooking efficiency**. However, given increasing sales in 2020 (despite COVID-19) and given ADES' recently enlarged production capacities and professionalised marketing and distribution systems it can be expected that efficiency soon will return to its previous, high levels.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Cooking Sector

Across Africa, Madagascar has the largest clean cooking deficit with less than one percent using clean fuels (see: SEforAll, 2019: Taking Pulse Madagascar 2019). 99 % of the population uses firewood and charcoal for cooking, while only 1 % of these households are using improved wood or charcoal stoves. As a consequence, Madagascar has one of the lowest ICS adoption rates globally. This low adoption rate can be traced back to a lack of customer awareness and consumer affordability challenges. The cookstove market in Madagascar is dominated by small-scale producers producing mostly artisanal cookstoves which are neither capable to produce semi-industrial cookstoves nor have the resources to invest in costumer awareness. The semi-industrial cookstoves production is still at a nascent stage and highly dependent on programmes of international organizations and NGOs such as ADES. ADES started its intervention in 2002, at a time where hardly any market channels for semi-industrial ICS existed. Today, ADES sells more than 45,000 cookstoves per year Estimations indicate a total need of 400.000 ICS per year. ADES's products are well known in the country. Among the Malagasy population, stoves are generally referred to as "Oli-c", regardless their fuel type, which normally forms the origin of the stove name produced by ADES. This is an indicator that branding (branded product) has taken place or is currently taking place.

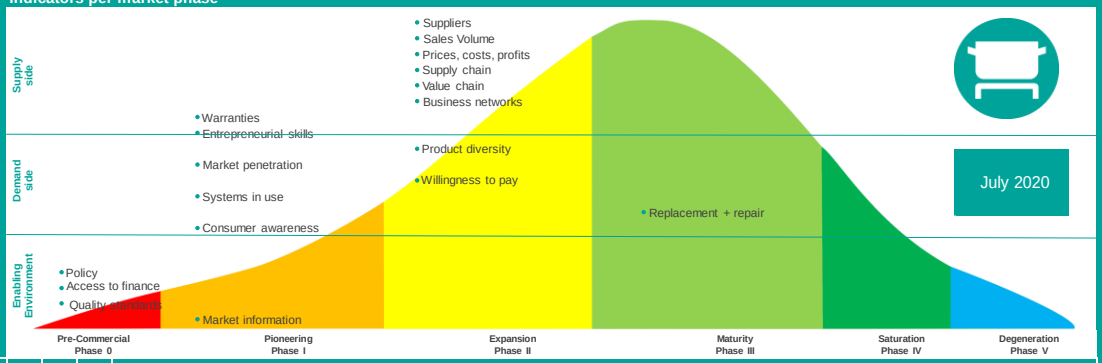
Summary EnDev Market Scorecard: Madagascar July 2020 Improved cookstoves

Market: ICS products in urban, periurban and rural areas. Partners are resellers and SMEs which sell 62% of the products. ADES has 8 stationary centres and one mobile centre.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	↗	Since April sales have slowed, since July most of the ADES centres are only partially open. Diego Suarez is since 01.07. an official new centre "mini-Antenne" since it is managed by one person and will deal only with resellers.
	S1V2	Business modalities	↗	↗	→	National passenger transport is generally subject to authorisation. The transport of goods that are not essential to life (premiere necessite) is subject to authorisation.The ports are closed but international goods transport by ship appears to be possible. Taxi brooms only run regionally. National passenger transport with Taxi-Brousse are set. Transports without a permit are only permitted for goods of the highest necessity
	S1V3	Formality	↗	↗	↗	Sales 13/07/2018 : 23286 | Sales 13/07/2019 : 18328 | Sales 13/07/2020 : 22431
	S1V4	Jobs created	↑	↑	↗	ADES retains all their staff. Senior staff members and managers work from home. Salespoints are closed in cities with restriction, production continues to date, at the moment we are all still working.
S2 Sales Volume	S2V1	Products / services sold	↗	↗	→	
	S2V2	Inventory turnover	→	↗	→	
S3 Prices, costs and profits	S3V1	Prices	→	↑	→	
	S3V2	Costs	→	→	→	
	S3V3	Profit margin	→	↗	→	
	S3V4	Investments	↗	↗	→	
S4 Supply chain and after-sales service	S4V1	Length		↑	→	As a result of COVID-19, the sales and awareness-raising missions of many centres had to be stopped early as the closure of the roads was announced.
	S4V2	Distribution channels	↗	↗	→	We are still distributing, but with huge admin. difficulties, every transport needs a special permission
	S4V3	Spatial reach	↗	↗	→	
	S4V4	Initial suppliers	↗	↗	→	The two new mobile centres are almost finished (Solar pannels montage still missing). Due to COVID-19 two month delay with finishing the work on the cars.
	S4V5	After-sales service	↑	↑	↗	Customers and resellers still visit our centres
S5 Value chain	S5V1	Value added	↑	↑	↑	ADES Stoves have become a trademark in Madagascar. People aks for specific models, like OLI-c
S6 Business networks	S6V1	Networks	↗	↗	↗	Expedition to new territoriy in the north east (set up of new distribution center through reseller) had to be stalled due to COVID-19.
	S6V2	Partnerships	→	↑	↑	We keep in touch with partners and take orders which we can after COVID-19 deliver.
S7 Warranties	S7V1	Warranties	↑	↗	↗	
S8 Entrepreneurial skills	S8V1	Financial literacy	↓	↗	↗	Internal courses are happening regionally only
	S8V2	Satisfaction level	→	↗	↗	
	S8V3	Marketing skills	↔	→	↗	
	S8V4	Advertising	▽	↗	→	
	S8V5	Production automatization	→	↗	↑	The new kiln is working, a couple of minor process are not finished yet due to COVIC-19. The new stove model OLI Turbo, a product that can burn both wood and charcoal, is currently in the test phase and is being further developed. The boiler will be replaced by an integrated clay version to save transport costs. About 20% less clay is used for production.
	S8V6	Standardized production	↗	↗	↗	
D1 Product diversity	D1V1	Diversity	↑	↑	↑	
D2 Market penetration	D2V1	Market penetration	→	↘	→	approx 2 - 4%. The number is decreasing year by year because the number of new households (1/7 of the population growth) is higher than the rate of increase in production.
D3 Willingness to pay	D3V1	Willingness to pay	↑	→	→	
D4 Systems in use	D4V1	Usage rate	↗	↑	↑	Usage rate approx 80% (Gold Standard report)
	D4V2	Maintenance	↗	↗	↗	
D5 Replacement and repair	D5V1	Replacement rate	↑	↑	↑	
	D5V2	Repair rate	↑	↑	↑	
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	↗	
	D6V2	Perception	→	→	→	
E1 Policy	E1V1	National plans	↔	↔	↔	
	E1V2	Policy	↗	→	→	
	E1V3	Product taxes	→	↓	↓	
	E1V4	Business taxes		→	→	
E2 Access to finance	E2V1	Subsidies	↑	↗	↑	
	E2V2	Financing options suppliers	↔	↔	↔	
	E2V3	Financing options consumers	→	→	→	
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	→	
	E3V2	Enforcement	▯	→	→	
E4 Market information	E4V1	Cost of information	→	→	→	
	E4V2	Market facilitation organizations	→	→	→	
	E4V3	Awareness campaigns	↘	→	→	
E5 Expertise development	E5V1	Courses	→	↗	↗	
	E5V2	BDT	▽	▽	▽	
	E5V3	User training	▽	▽	▽	

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• ADES continues to support the Government of Madagascar in developing and enforcing **national standards for improved cookstoves** to ensure that high quality products are sold and used. • ADES's **test laboratories** to control the quality of cookstoves can be used as example for future national testing facilities.
Supply side	• Planned continuous **increase in production figures** in the coming years from 50 000 units per year in 2020 to 70 000 units per year in 2025. • Future scaling through focus on **improving marketing and increasing sales** of quality products as well as **optimizing ddistribution** (partnerships with additional transport companies; new warehouse for storage and swift distribution in Antananarivo in operation since 2019). • Improved **response to specific needs** of the demand side based on outcomes of an ongoing market potential study to scale up sales, e.g. via innovative RBFs. • High potential to contribute to sector transition by **expanding the market area to remote locations** through mobile promotion, sales centres and mini-salespoints, extension of the network of resellers (currently 100) and resellers. • Intensification of **inhouse professional training** for young people to share knowledge on management, technology and marketing will contribute to market development. • Potential to **combine gender objectives with scaling sales**: RBF experience with women ICS sellers (incentive when ICS is sold by women; simple RBF mechanism without involving a bank, directly managed by ADES).
Demand side	• High demand and market potential for **new ICS products adapted to customer needs**, through which ADES enlarges its product range, e.g.: (i) a new prototype OLI-MIX i.e. an ICS for wood and charcoal with lighter weight is currently being tested; (ii) solar-powered water heaters and a new large ICS stove which are developed for social institutions like schools in combination with solar cookers. • Further demand stimulation and market development through **support and training of customers** including efficient **after sales services** (e.g. through mobile sales centres, after sales visits, sensibilisation and raising the environmental awareness). • Overcoming the affordability challenge by introducing **new pricing models** as key measure to develop further markets, for example: flexible pricing (urban - rural or north vs. south). • **Specific COVID-19 relief actions**, instalment payments, voucher systems for poorer households, cash-for-work alike approaches, RBF for special ICS markets targeting the poorest or sellers.

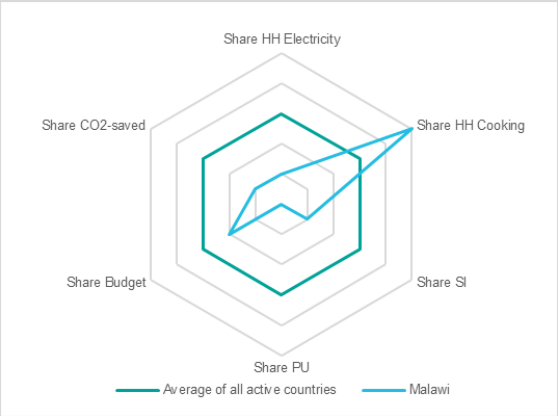
Malawi

Section 1: Key facts

Country facts	
Population	18.2 million
HDI	172 ↑ | Total (0.49)
UN Classification	LDC / LLDC
Access clean cooking	9 % urban < 5 % rural
Access electricity	55 % urban 10 % rural

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
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• The government of Malawi is aiming for 100% of the population having at least tier-1 electricity access by 2030 in its national **SEforAll action agenda**, but a large proportion of up to 70% need to be served through off-grid solutions. • **Clean and efficient cooking** in Malawi is **highly relevant** as 98% of all 3.9 million households still use solid fuels for cooking, leading to continuous depletion of forests and natural resources. • EnDev Malawi is amongst others coordinating the **National Cookstoves Steering Committee (NCSC)**, a unique multi-stakeholder platform led by the Department of Energy Affairs, and responsible to monitor progress towards achieving the **national ICS targets** (2 million improved cookstoves (ICS) by 2020; 5 million by 2030). • With a strong **focus on poor rural households** and the principle of "leave-no-one-behind" (LNOB) EnDev is contributing by **energizing lives** and the **climate** in one of the poorest sub-Saharan countries (51.5% of population live under the national poverty line, of those 59.5% in rural areas). • EnDev is implementing a **private business-driven approach** to support the sustainable growth of ICS markets in an environment with high dependency on ODA and carbon finance.
Contribution to paradigm shift	• Scaling and further market development through **targeted support to solar companies**, e.g. through marketing campaigns supporting almost all off-grid solar companies selling **Lighting Africa certified quality products** (picoPV and SHS). • ICS market transition and expansion is supported through **standard-setting, professionalization and commercialization** at all levels of the supply chain to reach the government's 2 million ICS target by 2020 (EnDev will contribute at least 38%) and the SEforAll target of 5 million ICS by 2030. • Distribution of stoves to the 10% poorest as part of a **social cash transfer scheme** through a RBF approach contributed strongly to overall ICS market development with regard to product availability and awareness in rural areas, while market potential for higher-tier technologies is still limited due to limited financial capacities of rural households. • Initiating and scaling of an emerging PUE market by setting up a **Productive Use of Renewable Energy (PURE) incubator** in support of a climate-friendly transformation of Malawi's underdeveloped, primarily agro-based economy. • Innovative clean energy solutions under development by EnDev show a high transformational potential for the **women-dominated fish processing sector**, relevant for the whole sub-region.

Important collaborations for scaling up	**Funding and investment** • Co-financing agreement with the **Embassy of Iceland** (715,000 Euro) for an energy program targeting the Mangochi District: enable access to 20,000 solar picoPV systems, 60,000 ICS, and 12 social institutions and deployment of efficient fish processing stoves among other PUE technologies until 06/2021. • MoU for joint scaling efforts with **Southern Africa Energy Program/SAEP**(USAID financed, USD 5 million), supporting solar companies operating in the off-grid PAYGO market for picoPV, particularly with regard to funding constraints. • Close cooperation with USAID- and UKAID-funded **Modern Cooking for Healthy Forests (MCHF) Project** (17 million Euro) including exchange and joint events. • Informal collaboration with the **World Bank** programme in support of the solar off-grid PAYGO market (USD 20 million).
	Implementation • Scaling of PUE approaches in the agro-processing sector in cooperation with the GIZ program **Green Innovation Centres for the Agriculture and Food Sector (GIAE)** in Malawi through joint implementation of the PURE incubator (GIAE: preparation of market studies; support of business contacts and PPPs). • Through its **local implementing partner** Maeve, EnDev has MoUs for its umbrella and individual fee-based marketing campaigns with **14 off-grid solar companies** to scale up sales. • With its local partners in the ICS component (United Purpose and Maeve) EnDev is directly cooperating with **50 stove production groups** and is responsible for at least 38% of the achievement of the 2 million ICS by 2020 goal of the GoM. • Fish processing technologies piloted with research facilities to scale up with other implementing actors (including **GIZ Aquaculture Value Chain Project**, USAID-funded **REFRESH Program**, FAO etc.)
	Knowledge sharing and learning • EnDev has a central role with regard to knowledge and information sharing in the ICS sector through the **multi-stakeholder National Cookstoves Steering Committee**, which is coordinated by EnDev (including the monitoring of the national ICS targets). • **Solar stakeholder meetings** are regularly conducted by EnDev to facilitate exchange between companies including technical input sessions.

Gender	• **Gender analysis** is in preparation; the ICS component already successfully addresses **women as users, producers and resellers** and will further intensify these efforts, e.g. female producers are encouraged to take on financial responsibility through financial literacy training. • The solar energy and PUE components are geared to the needs of women customers and aims at **targeting women-led enterprises**. • Over 80% of the **targeted fish processors** along the over 700 km of lakeshores are female.

Consideration of ITAC recommendation

Solar component

- **Focus on Quality:** Cooperation with the Malawi Bureau of Standards has so far only happened in regard to ICS. Solar issues still need to be taken up.
- **Use of experience:** EnDev and Maeve's experiences in the solar sector has led to an MoU with USAID's SAEP.
- **Support of Industry Bodies:** regular meetings with the Renewable Energy Industry Association of Malawi (REIAMA) to supports their activities. A formal cooperation is planned.
- **Strengthening the solar hotline:** This is also a proposed COVID-19 response measure, as it was not in the focus before.
- **1-Stop-Solar-Shops:** Have been piloted, but not yet proven as an effective tool for the time being.

Productive Use of Renewable Energy Component

- **Formal connection to financing partners:** Learnings and formal connections for financing partners have not been generated yet, due to a delayed start of the PURE incubator.
- **Sharing of learnings:** Learnings during the R&D for the fuel-efficient fish processing stove have been widely shared through multipliers (mainly GIZ's Aquaculture Value Chain Project) and fishing sector fora.
- **Focus on project sustainability:** The focus on sustainability is immanent to the project (e.g. through the planned institutionalization of the learnings of the PURE incubator at REIAMA).

Cooking Component

- **Sustainability of cooking sector through a strong NCSC:** NCSC's goal of 2-million ICS by 2020 will be achieved (mid 2020 at 1.95 million, EnDev has contributed to about 38% of the goal). VAT waiver for ICS to mitigate the risk that VAT becomes a barrier in scaling stove commercialization is in place through the lobbying of the NCSC.
- **ICS for SI:** replacement schemes have not yet been addressed, but will be a focus in the coming months also as a COVID-19 response.

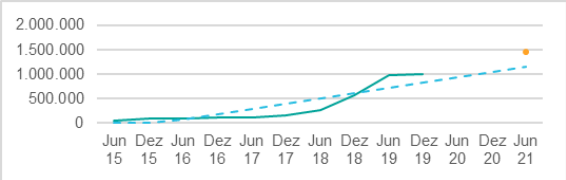
Quality of response to ITAC recommendations (on a scala from low-medium-high): **medium**

Section 3: Performance

Effectiveness

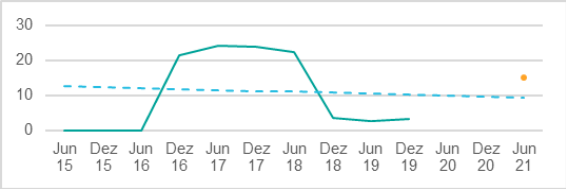
HH Access Cooking

Targets: 1,450,000 Achieved: 1,001,489



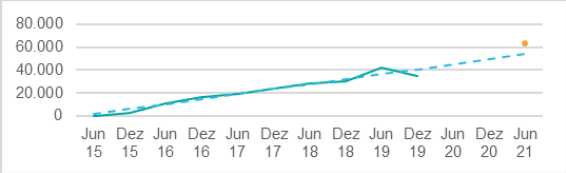
SI Access

Targets: 15 Achieved: 3



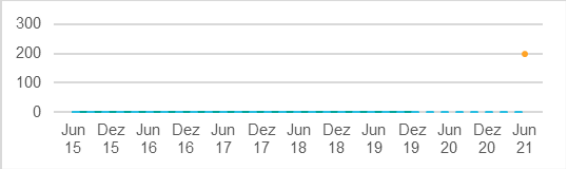
HH Access Electricity

Targets: 63,000 Achieved: 34,994



PU Access

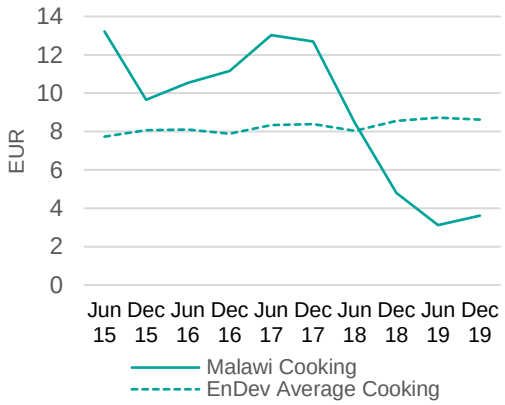
Targets: 200 Achieved: 0.0

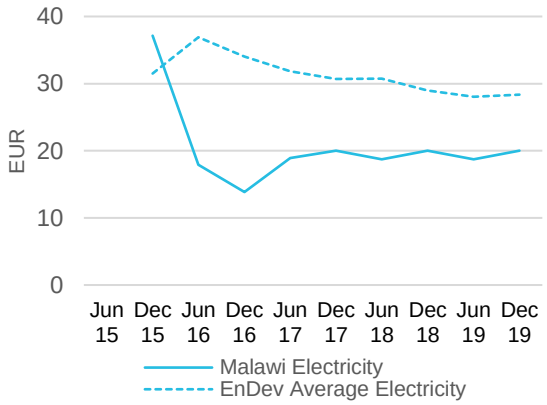


Additional info

- **HH access cooking and electricity:** A slight stagnation towards the end of 2019 is due to minor implementation gaps caused by necessary coordination during contract extensions with implementing partners; with the current co-financing from Iceland in the Mangochi District as well as with planned COVID-19 mitigation measures (solar equipment for health posts and guardian shelters etc.) figures will raise up again.
- **SI access:** In 2018 a total of 487 fuel-efficient institutional cookstoves have been installed in 150 schools together with GIZ's Nutrition and Access to Primary Education (NAPE) project, which supports school feeding at primary schools in Malawi. In 2019 another 36 stoves were built in 10 schools from own resources. EnDev is currently mobilizing other partners for its SI interventions with regard to institutional cooking. As a COVID-19 measure EnDev will support the construction of stoves in guardian shelters of hospitals and health posts.
- **PU access**: The PU component is a new component in Malawi, so no results yet by 12/2019. Pilots for fish processing stoves which started early 2020 look promising for scaling-up, other PU pilots have not yet started due to COVID-19 induced delays.

Efficiency





Additional info

- **Cooking efficiency**: Through EnDev support (e.g. social cash transfer RBF promoting ICS on a large-scale including knowledge transfer, professionalization etc.) and carbon finance (making large bulk sales and exponential growth possible) ICS production capacities and markets have developed and became increasingly efficient.
- **Electricity efficiency**: EnDev included more local solar companies in its support rooster; the 14 companies supported nowadays represent almost all professional solar companies in Malawi who sell Lighting Global-certified products. EnDev provided a holistic capacity development programme for these companies, thus enabling them to become more efficient.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

The solar market for **picoPV and SHS** is still in an early stage with sales of ~80,000 units p.a. ($2.3 million 2016-2018, GOGLA). EnDev's support activities like marketing campaigns for certified solar products, awareness raising measures etc. were instrumental to lift the market out of its initial, very low stage. EnDev's interventions paved the way for other donors (e.g. USAID and World Bank) to engage in the off-grid solar power market, which among other activities provide incentives for companies to expand their PAYGO business. In conjunction with EnDev's portfolio, this has the potential to unfold exponential market growth. However, markets for higher tier solar installations (e.g. PV panel installations on SI) still suffer from limited professionalization of companies and insufficient quality of installations. While recent years has seen some decrease in product price, the barriers for investment in off-grid solar remain high due to low purchasing power. Access to user-friendly payment terms are therefore key. Currently, EnDev is in discussions with PULA insurance to support the companies in regard to risks resulting from default rates for PAYGO systems. With the solar market becoming more established, the area of electric waste management will be an increasingly important focus area. Although showing high potential, the **PU sector** is still young and requires a high degree of complementary market education and support in order to grow. Several initiatives/ventures have left the R&D phase and have reached proof-of-concept with their technology or business model, but most approaches are donor-driven and not yet economically sustainable. PicoPV for certain PU (e.g. solar lighting for small bicycle taxis) shows market potential. The potential for **micro-hydro power** – possibly in combination with **solar mini-grids** – will be further explored in areas with perennial water streams as an option to respond to higher tier electricity needs of PU solutions. In addition, off-grid energy solutions for social institutions are currently piloted through the co-funding by the Icelandic Embassy.

Cooking Sector

The ICS market in Malawi is in early transition from pioneer to expansion phase. EnDev has been instrumental in shaping market development promoting especially least-cost, fully locally produced, efficient firewood cookstoves. Since 2013, 688,041 households have gained access to modern cooking energy through EnDev support. Market development for the tier 2 Chitetezo Mbaula firewood stove promoted by EnDev is well advanced for the urban population, but has not yet been weaned from donor support, particularly for transport costs in rural areas. Higher quality household stoves are not considered marketable in rural areas, if at all in urban areas, which the USAID- and UKAID-funded Modern Cooking for Healthy Forests (MCHF) project is already targeting. The entry of new actors into the cleaner cooking sector in Malawi such as the MCHF, working on charcoal and more advanced cooking solutions, show the success of EnDev work towards the expansion phase. However, ICS markets are yet not sufficiently developed and still need further efforts to enter into an expansion phase with an independent value chain, and to decouple a viable commercial market from carbon financed bulk-sales and NGO-financed ICS distributions.

Impacts of COVID-19

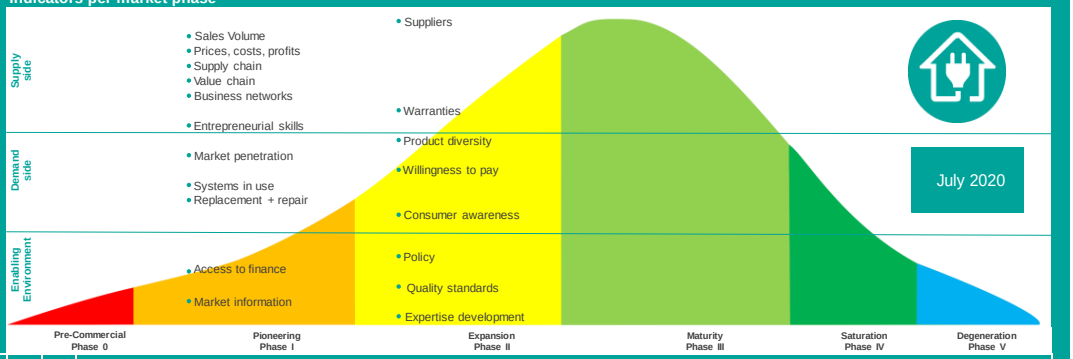
Import, distribution and marketing challenges under COVID-19 restrictions have severely affected the markets for energy and clean cooking access. Many import-dependent solar companies have only very

low stock-levels. The government restrictions have significantly slowed down marketing initiatives and the presence of companies in districts, culminating in decreased sales, aggravated by loss of purchasing power and shift of priorities by customers due to the economic impacts of the pandemic. As seen in the scorecards below, many market development indicators worsened, pushing achievements back into the pioneering phase. Without a COVID-19 relief fund, many companies (especially SMEs and retailers) may not be able to continue operations

Summary EnDev Market Scorecard: Malawi July 2020 Solar Products

Market: Solar PicoPV Market in Malawi

Indicators per market phase



Market trends

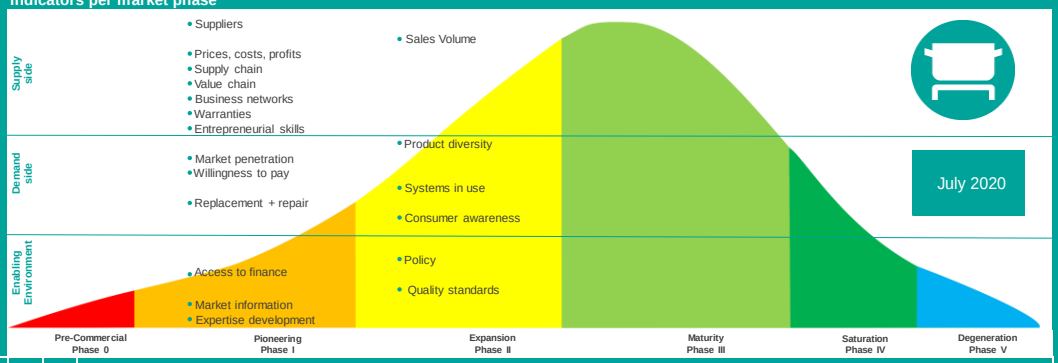
Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	→	Still relatively few businesses in the market.
	S1V2	Business modalities	→	→	Businesses are noted to have their own specific distribution channels, target groups. Some companies are noted to only stock in formal structures, others informal and others both informal structure, and others prefer to work with organised structures or directly only rely on direct sales options. There is some level of differentiation among businesses.
	S1V3	Formality	↗	→	Sensitization of business formalisation is established by the energy regulatory authority - which forced businesses owner to have their businesses further licensed or further force sanctions.
	S1V4	Jobs created	↗	↘	Jobs increase with as result of result based financing opportunities by USAID which aimed at improving distribution chains, have in a way allowed agent recruitment and consequently increased number of jobs. Evidenced visibility of retailing.
S2 Sales Volume	S2V1	Products / services sold	↘	↘	Companies and Maeve continue to sell solar products with limited targeting options and reduced audience as a precautionary measures. Stocking delays due to import challenges, companies not selling in some periods.
	S2V2	Inventory turnover	↑	→	Attributed to low stock levels, and also customers diverting funds to procure other essential items other than solar.
S3 Prices, costs and profits	S3V1	Prices	↗	→	Result based financing option due to other donor-funder projects
	S3V2	Costs	→	↘	There has been some decrease in costs but largely due to donor subsidy/RBF
	S3V3	Profit margin	↑	↗	Companies make some profit
	S3V4	Investments	↑	↘	Due to COVID-19, and consequent low sales companies invest at a low level.
S4 Supply chain and after-sales service	S4V1	Length	↑	→	No changes on the length of the supply chain and after sales service
	S4V2	Distribution channels	↗	→	No changes on the distribution channel since december 2019.
	S4V3	Spatial reach	↗	→	Most of district has been reached by the companies. Sustainability still in question.
	S4V4	Initial suppliers	↗	→	Very few companies service products and this has not changed since December 2019
	S4V5	After-sales service	→	→	Very few companies start to look into after sale services - attributed to other the USAID KickStarter Project
S5 Value chain	S5V1	Value added	↗	→	Very few companies do value addition such as rebranding their products i.e. 3 of the 14 partner companies.
S6 Business networks	S6V1	Networks	→	→	Networks have been formed mostly initiated by donors. No further changes seen since December 2019.
	S6V2	Partnerships	→	↗	In light of COVID-19 some companies that taken up more partnerships to push in more sales. E.g. an endev partner collaborating with the civil service commission for PAYGO technology adoption.
S7 Warranties	S7V1	Warranties	↑	→	Since last year 2019 no changes have been made. Companies under donor funded projects, stiill work to honour warranties and also to build trust amongst the customers.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	↘	There's been a gap due to COVID-19 as trainings that could have helped did not happen
	S8V2	Satisfaction level	→	↘	COVID-19 affected satisfaction. Low levels of sales.
	S8V3	Marketing skills	→	↗	More companies are now seen to put out more adverts in the social media
	S8V4	Advertising	→	↗	Example: Zuwa energy targetting civil servants
	S8V5	Production automatization	→	→	In Malawi there are currently two solar companies that produce there own products: Team Planet and Vitalite.
	S8V6	Standardized production	→	→	1 Company- Team Planet currently produces its own products.
D1 Product diversity	D1V1	Diversity	↑	→	Positive trend in December, stagnation in July due to COVID-19. Products in Malawi show diversity ranging from lighting only, charging and lighting, and Solar Home Systems.
D2 Market penetration	D2V1	Market penetration	↑	↗	The Intergrated household survey of 2018 shows that atleast 6% of the population have access to off-grid solution mostly solar.
D3 Willingness to pay	D3V1	Willingness to pay	↑	↗	Growing demand as clients hear about products more, and generally there is a greater proliferation of products. Both December and July.
D4 Systems in use	D4V1	Usage rate	↗	→	Specific with PAYG companies they have noted higher usage rate owing to the low default rates of 2 to 10% confirmed by two companies.
	D4V2	Maintenance	↗	↗	Applies to both December and July. Consumers are somewhat aware on how to keep their products as companies make this information available.
D5 Replacement and repair	D5V1	Replacement rate	→	→	USAID Kick Starter Project requirement for companies to hold a warranty increase replacement rate
	D5V2	Repair rate	→	→	Companies do not have the capacity, and there's less needs for companies to do this as suppliers do a replacements process- true for both December and July.
D6 Consumer awareness and perception	D6V1	Awareness	→	↗	More companies with better marketing abilities and more products available-true for both December and July.
	D6V2	Perception	↑	↑	Interest of solar amongst households increases for areas where awareness campaign have taken place, as household have experienced the products.
E1 Policy	E1V1	National plans	→	→	Renewable Energy Strategy was drafted which indicated that by 2020 there should be universal access to energy for at least 50%, Energy policy, SE4All Action Agenda
	E1V2	Policy	→	→	Renewable Energy Strategy was drafted which indicated that by 2020 there should be universal access to energy for at least 50%, Energy policy, SE4All Action Agenda
	E1V3	Product taxes	→	→	VAT removed from solar products
	E1V4	Business taxes	→	↗	Recent political events have increased faith in the government, which may reduce any inclination towards tax evasion.
E2 Access to finance	E2V1	Subsidies	→	→	Small percentage of existing companies are involved in the USAID RBF programs.
	E2V2	Financing options suppliers	↓	↓	Financing options now available through e.g. USAID- engaged some banks as financers- more since 2019, FINCOOP, negative in July due to the increased risk of investment.
	E2V3	Financing options consumers	↑	→	PAYGO more widely used by companies. This could be a more continuing upward trend.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	→	↑	The regulations regarding solar products are available in the Renewable Energy Strategy, Kickstarter Program- need to double check if MBS has formally adopted anything- need to look into
	E3V2	Enforcement	→	→	No enforcement measures by policymakers
E4 Market information	E4V1	Cost of information	↓	↓	Donors facillitate market information, GIZ, EnDev, USAID; flow of market information has been hampered by COVID-19 regulations, positive trend in December
	E4V2	Market facilitation organizations	↓	→	No major changes on this since December. There is still a mix of private marketing agencies and NGOs that support marketing.
	E4V3	Awareness campaigns	→	→	E.g. USAID implementation with the government, the WB program and also EnDev due to the collaboration with USAID in the SHS Kick Starter Project. No changes made since last year. Limited field activities due to COVID-19. Other player such as USAID reduced activity after COVID-19. EnDev still the main player for awareness.
E5 Expertise development	E5V1	Courses	↑	↘	E.g. University (Mzuzu University, Malawi University of Science and Technology), Technical Vocational (TVET) centres intergrate solar into their curriculum/courses. Due to the COVID-19 outbreak, suspension of courses and currently not clear when schools reopen.
	E5V2	BDT	↑	→	Increase in trend in December, there is more willingness from companies to do BDT. Stagnation in July, positive trend in Decemebr.
	E5V3	User training	↗	→	Slight increase in December, stagnation in July. Companies support user trainings by making information on how to use systems more available when marketing.

Summary EnDev Market Scorecard: Malawi July 2020 Improved cookstoves

Market: The entire cookstove market in Malawi

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	-

Indicators	Variables		Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↑	→	Chitetezo Mbaula businesses are many in the market but for other technologies there are few.
	S1V2	Business modalities	↗	↗	Most stove producers have other occupations; however, increasingly some are becoming professional stove producers. Suppliers of other Technologies do not solely supply stoves.
	S1V3	Formality	↗	↗	Suppliers of other technologies are registered companies but most groups producing the Chitetezo Mbaula are not registerd
	S1V4	Jobs created	↘	↘	For Chitetezo Mbaula, most of the jobes created are only part-time but in most groups are in excess of 20 people employed. Other Technologies have not created a lot of jobs.
S2 Sales Volume	S2V1	Products / services sold	↘	↘	High sales helped by ODA for Chitetezo Mbaula. For other technologies, sales have been low due to high market prices.
	S2V2	Inventory turnover	↔	↗	The market is starting to pick up again after inactivity due to COVID-19 which means higher turnover.
S3 Prices, costs and profits	S3V1	Prices	↓	↓	Most stove traders and customers both complain that WTP is low at set price. Compounded by less disposable income due to COVID-19.
	S3V2	Costs	↗	→	For most stove production groups (SPGs), plans for higher efficiency mechanisms such as bigger firing kilns/warehouses are on hold. For other othertechnologies, import costs are quite high.
	S3V3	Profit margin	↘	↓	Reduced WTP means that profit margins are decreasing
	S3V4	Investments	↗	→	Very small investment that is donor riven to keep production afloat
S4 Supply chain and after-sales service	S4V1	Length	↔	↔	For Chitetezo Mbaula, there are several entities driving the supply chain. For other technology, it is usually one entity that imports and sells to final to user.
	S4V2	Distribution channels	↑	↑	Implementing Parterns are working to strenghten these channels
	S4V3	Spatial reach	↔	↔	Spatial reach increased due to ODA but without it would shrink
	S4V4	Initial suppliers	↗	→	Same suppliers, no new entrants. Imports constrained by boarder closure.
	S4V5	After-sales service	↗	↗	Possibility of replacing broken stoves and resuing them in social institutions
S5 Value chain	S5V1	Value added	↘	↓	WTP is low
S6 Business networks	S6V1	Networks	↑	↑	Due to donor funded interventions
	S6V2	Partnerships	→	→	
S7 Warranties	S7V1	Warranties	↗	↑	Considering replacing broken stoves as a COVID-19 response measure
S8 Entrepreneurial skills	S8V1	Financial literacy	↔	↔	Differences observed between Chitetezo Mbaula Suppliers and other Technolgies with the later having better business skills than the former.
	S8V2	Satisfaction level	↗	→	
	S8V3	Marketing skills	→	↘	
	S8V4	Advertising	↗	↑	For other technologies, they advertise individually and through National Cookstoves Steering Committee. Chitetezo Mbaula groups rely on partners.
	S8V5	Production automatization	→	→	
	S8V6	Standardized production	↑	↑	Manual available. Specific equipment recommended for production.
D1 Product diversity	D1V1	Diversity	↑	↓	Overall, service diversity has been negatively impacted by COVID-19 due to lack of national transporting and international imports for stoves • Firewood: Service delivery affected due transport and warehousing deficits for mobile stoves. Distribution from productions sites to outlets has decreased. • Alternative Biomass fuels and stoves: mostly pre-commercial phase with stove parts that are usually imported have slowed down and the market is not entirely taking off • LPG and LPG stoves: a slight decrease then increase then decrease again in imports due to Covid-19 and closing of borders
D2 Market penetration	D2V1	Market penetration	↗		• Firewood & Firewood stoves: The attempt is to rope in the private sector to pick up the transport link and warehousing in order to get the product to outlets and increase demand. The distribution is the key to production and demand staying up. • Alternative Biomass fuels and stoves: availability, affordability and transporting alternative fuels to the end-user is not entirely viable. • LPG and LPG stoves: enabling environment and awareness raising to household users is very much needed. Business/industrial users are not too much of the problem. But the closure of the hospitality and tourism industry due to COVID-19 has negatively impact sales for both industrial and household sales.
D3 Willingness to pay	D3V1	Willingness to pay	↑	↔	• Firewood & Firewood stoves: price of Chitetezo Mbaula was increased in Dec 2019 to make it more profitable, but the project measures failed and were aggravated by COVID-19. Rural users' willingness to pay becomes non-existent since people have no money. Urban users are willing to pay the set price of stoves as they buy firewood anyway and make cash-expenditures for all expenses. Demand is still vibrant. • Alternative Biomass fuels and stoves: urban users' willingness to pay has dcreased due to pricing of alternatives • LPG and LPG stoves: willingness to pay has increased because LPG has 17% of savings due to VAT removal and so the end-user prices have dropped and world prices have dropped in total by 25%. This has a larger impact on industrial users than household users, however
D4 Systems in use	D4V1	Usage rate	↑	→	No change to due to COVID-19 has been observed amongst existing users. Within stove stacking, a stove technology bought is going to be used within its place in the preference hierarchy for what it is designed to do, e.g.: for daily meals, users are going to use a Chitetezo Mbaula. Only when they have larger gathering meals such as at funerals, will they then resort to a three-stone fire.
	D4V2	Maintenance	↑	→	Before users purchase a technology, they may not have any maintenance knowledge. But when they buy, their acceptance, usage and maintenance is in the expansion phase as they are made aware.
D5 Replacement and repair	D5V1	Replacement rate	↘	↓	Replacement rates for all ICS are towards zero because of accute money shortages due to COVID-19.
	D5V2	Repair rate	▯	▯	Chitetezo Mbaula cannot be repaired. For alternative stoves, we do not know. For LPG, users can call for repairs.
D6 Consumer awareness and perception	D6V1	Awareness	↑	↔	For urban areas, LPG awareness is going up due to adverstising and social media. In rural areas, no awareness and outreach is happening for ICS due to COVID-19.
	D6V2	Perception	↑	→	The market is currently underserved. However, the same remains that those who adopt ICS are able to compare with previous technologies, they know how to identify a good stove from a bad stove and they also perceive the technology positively. This applies to both free distribution stoves and commercially bought stoves across the different technologies.
E1 Policy	E1V1	National plans	↑	→	Government of Malawi indicated plans to further distribute improved cookstoves until 2030 of up to 5 million. Need to check reference of such. No further ammendments have been made since 2019. National Cookstove Strategy in place.
	E1V2	Policy	↑	→	Energy policy, Sistainable Energy for All Action Agenda, National Cookstoves Strategy/Roadmap are in place and indicate the same.
	E1V3	Product taxes	↑	→	VAT exception on cookstoves communicated last year by the Malawi Revenue Authority. No further changes have been communicated.
	E1V4	Business taxes	↗	→	Most traders for the Chitetezo Mbaula cookstoves are informal and consequently very little taxes are paid to the government. No changes effected since December 2019.
E2 Access to finance	E2V1	Subsidies	→	→	ICS specifically Chitetezo Mbaula donors subsidize distribution of the technology. This hasn't changed since December 2019.
	E2V2	Financing options suppliers	↗	↗	Even though there have been talks with financing institutions in supporting ICS distribution, there hasn't been any progress on this, pilots done. No changes on this since December 2019.
	E2V3	Financing options consumers	↗	→	Sensitization of financial institutions is done. Example include inclusion of FINCOOP (a Microfinance institution) within technical working groups of the National Cookstove Steering Committee.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	Improved cookstove standards have been developed and are in place. No changes made since December 2019.
	E3V2	Enforcement	▽	→	Enforcement unorganised and no changes to this have been affected. Noted to have stoves in the market that have not been tested and are still being distributed.
E4 Market information	E4V1	Cost of information	→	→	Donors provide market information and make them public through social media, websites eg. Initiatives such as MphamvuNow publicise.
	E4V2	Market facilitation organizations	↗	→	Mostly donor-funded market faciliation organisation are in place. With very few private marketing agency supporting marketing of stoves to corporate clients.
	E4V3	Awareness campaigns	↑	→	Donors support the government in creating awareness for improved cookstoves, mostly through NCSC players. This involves campaign creation and leveraging forums.
E5 Expertise development	E5V1	Courses	↗	→	Few universities that teach renewable energy cover topics on improved cookstoves and energy sources related courses into there curriculum e.g. Mzuzu University, Lilongwe University of Natural Resources. Status of this remains the same as before.
	E5V2	BDT	↗	→	Development Labs occusionally offer business training to energy entrepreneurs which at times include stove producers. Also in the cookstoves sector business ethics/trainings sometimes provided to stove producers the case of Chitetezo Mbaula.
	E5V3	User training	↗	↑	Mostly donor programs provide user trainings of cookstoves and also few enterprises also do the same of there ICS technology.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Support to industry-led advocacy efforts by supporting the **Renewable Energy Industry Association of Malawi (REIAMA)** and facilitating exchange between solar companies. • Use EnDev's position in the ICS market and in the NCSC to **leverage for an ambitious goal** beyond the 2 million ICS target for 2020 and for the required market transition to fully commercially driven markets. • Support to improved **alignment between PU and electrification efforts** and laying the cornerstone for a PU market including the attraction of private investors and entrepreneurs. • Engagement of Malawi Bureau of Standards (MBS) towards introduction and enforcement of **Lighting Global standards** in Malawi to reduce negative perceptions generated by uncertified products.
Supply side	• Support to **solar companies to professionalize** marketing and last-mile distribution, product servicing, electric waste management and promotion of certified Lighting Global products (including addressing challenges caused by the COVID-19 pandemic). • Development of a **result-based financing scheme for ICS** promotion that takes social, regional and sustainability aspects into account to further commercialize the market at the bottom of the pyramid and lift it out of the COVID-19 induced downturn. • Development of the **PURE incubator** in cooperation with HIVOS and REIAMA as essential instrument to kick-start the PU sector and to support SMEs and start-ups in developing sustainable, commercially viable PU solutions ready for market entry (including match making to leverage private investments). • Further development and promotion of efficient Chitofu **fish processing stoves** and exploration of potential in regard to solar cooling. • Exploration of the potential for the roll-out of **integrated energy solutions for social institutions**, which are currently piloted through the co-funding by the Icelandic Embassy.
Demand side	• Support through **customer surveys, awareness campaigns and the solar hotline** to monitoring and enforce warranty fulfilment of solar companies to ensure sustained trust in certified picoPV and SHS. • Support to **increased affordability** of solar and ICS products through specific payment solutions in the rural areas and work at policy level Increased **demand of potential PU customers** (being in most cases micro agro-business /SMEs) through targeted cooperation with GIZ programmes and other development projects who work on capacity development and Business Development Services. • Leverage market demand for **institutional cooking solutions** (e.g. ICS in health centres or schools) by strategic partnerships with other donor initiatives and commercial applications (PU) where possible.

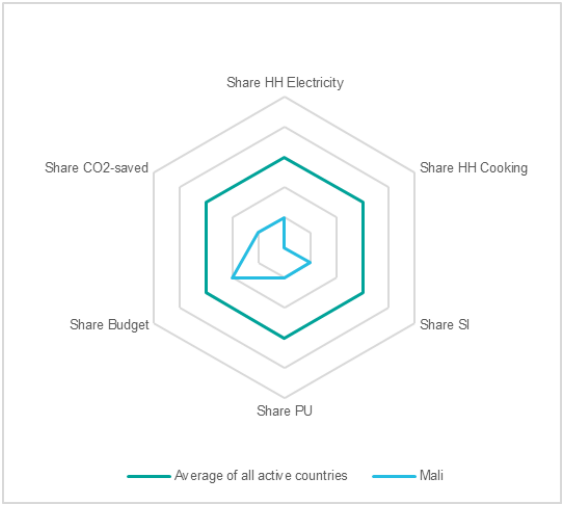
Mali

Section 1: Key facts

Country facts	
Population	19.1 million
HDI	184 ↑ | Total (0.43)
UN Classification	LDC / LLDC
Access clean cooking	< 5 % urban & rural
Access electricity	86 % urban 25 % rural

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
Implementer	GIZ, SNV, NIS
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• Over the last years, EnDev Mali shifted its focus from isolated local level impacts to the translation of field-experience in a **national vision** to achieve energy access goals in 2030 while also contributing to national decentralisation objectives. • EnDev contributes to **stabilizing the country** touched in many parts (especially North and Centre of the country) by insecurity by supporting off-grid access to electricity and clean cooking in remote, rural areas and vulnerable settings. • EnDev's income generating PU activities based on solar off-grid and clean cooking technologies contribute to **resilience of households and public services** in areas at high risk and in close cooperation with communes which ensure co-funding through budgets for electrification. • EnDev is a key actor in **improving national health care** by supporting electrification of off-grid clinics in remote, rural areas. • With its new ICS component (since 2019) EnDev contributes to **reduced use of firewood and deforestation** while by promoting the use of solar energy is fully in line with **national climate objectives** (NDC).
Contribution to paradigm shift	• The nationwide piloted **picoPV/SHS** sub-sector now starts to expand in a larger solar market; • Solar companies are supported to **professionalize their businesses** and to improve still often low quality of products and services e.g. through improved market and product information (investment opportunities and guidance), labelling and quality equipment. • To further upscale clean energy access and boost market development towards SDG's/SEforAll goals EnDev supports since the 2nd half of 2019 the sustainable **electrification programme of rural clinics** which includes sustainable repair/recycling activities, a quality campaign and also clean cooking measures. • Through an **integrated approach** launched 2017 in a southern pilot region (Baroueli) business models for a range of solar and ICS technologies (including mini-grids) are developed to increase effectiveness and visibility, attracting additional (private) funding. • Approaches and models developed in the southern pilot region serve as **example for other regions** and are especially used for scaling in selected villages in the instable northern regions. • EnDev is supporting a **quality label** for efficient cookstoves as the necessary basis to boost supply and demand and to reach scale, especially in regional cities.

Important collaborations for scaling up	**Funding and investment** • EnDev's integrated approach in the Baroueli region attracted a **French mini-grid and nano-grid company**, seeking to invest in higher tier energy access in eight villages supported by EnDev with additional financing coming from Sweden, Switzerland and possibly Germany. • The planned **World Bank global COVID Response programme** might include the electrification of clinics, for which EnDev is well positioned to deliver technical assistance. • Endev Mali is **exploring financing options** with a range of organizations (e.g. with the French AfD for supporting clean cooking; with AfD, World Bank and BAD on the mini-grid sector; with REACT, develoPPP and the EU on private sector development). • **Norway** is financing through MINUSMA solar street light development in the northern part of Mali; EnDev's implementing partner NIS (Nordic International Support Foundation) is executing the work. • The World Bank financed **Regional Off-Grid Electrification Project for West Africa** (ROGEP) identified Mali as one of the target countries and is expected to contribute to exponential growth of the Malian solar off-grid market once it is launched.
	Implementation • For scaling activities EnDev collaborates especially with the **Department of Energy** responsible for the energy-sector on national level as well as with national energy agencies and especially **local communes** and a large range of **NGO**'s like GERES, Plan international. • Scaling electrification in the health sector is coordinated with the national **Ministry of Health and UNICEF** and others. • Improving the labelling cookstoves takes place with an inclusive approach and in collaboration with **ICS manufacturers** and the **Mali Alliance for Clean Cooking (MACC)**. • For specific technologies and approaches EnDev collaborates closely with **other GIZ projects** (e.g. with GIZ implemented global project Powering Agriculture on solar cooling and O&M/repair schemes for solar off-grid systems).
	Knowledge sharing and learning • Close collaboration with **private companies and NGO's** to develop and share know-how on new technologies and approaches (e.g. piloting a prepaid metering system that is being scaled at mini-grids and allows for remote monitoring; alternative cooking fuels research; ICS and picoPV PAYGO for productive use; electric waste recycling). • Exchange through the EnDev-led **Regulatory Committee** as a national stakeholder platform for ICS labelling bringing together government bodies and the private sector. • Monthly meetings of international organizations supporting the energy sector in Mali (***Groupe PTF***).

Gender	A detailed **analysis of the gender context** took place in line with recommendations in the project proposition. Besides actions identified in the project proposition, GIZ Mali asked EnDev to deliver input for gender strategies in the energy sector on national level.

Consideration of ITAC recommendation

Strategic orientation: EnDev Mali has changed its strategic orientation and is now fully applying a market-based approach.

PicoPV approach: A picoPV RBF is set up and EnDev's approach is additional (focus on market know-how and on last mile support) and regularly evaluated.

Economic viability of mini-grids: Co-investing in a village-grid can be necessary 1) for mini-and flex grids that are otherwise not cost-effective, and 2) to stimulate grid-connexions which are hardly executed without village grid.

Remote monitoring: Remote monitoring is not yet evident in Mali; however, first pilots at mini-grid sites take place, also by EnDev. In the meantime, technical support by EnDev trained technicians at proximity e.g. of electrified rural clinics is of key importance.

Electric waste: Regular publications inform about EnDev's electric waste initiative. It is recommended that recycling standards will also become more explicit in the Lighting Global certification.

Activities in conflict-prone north of Mali: The initial idea and ambition has been to develop mini-grids in this region, yet budget restrictions have prevented EnDev until now to realize this approach. At present, the approach in northern Mali includes lighting of public places or markets and facilitation of households and productive use through energy-kiosks.

Approach for new clean cooking component: An inclusive approach is chosen and institutions as well as companies actively participate in the process to define and operationalize a quality label for ICS. The Mali Alliance for Clean Cooking, has been selected to support this process and is assisted by EnDev.

Gender: Female involvement is considered crucial by EnDev as representation of women in the electricity sector is still poor (as it is in the cooking sector with regard to men!). Women have especially in productive use of energy activities an important role: about 80% of the actual productive use facilitated through lease-purchase is operated by women (especially use of solar fridges).

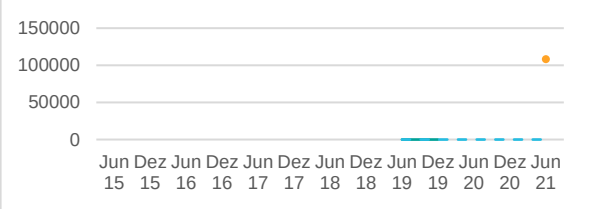
Quality of response to ITAC recommendations (on a scala from low-medium-high): **medium**

Section 3: Performance

Effectiveness

HH Access Cooking

Targets: 108,000 Achieved: 0.0

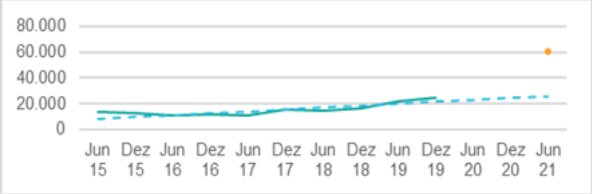


SI Access

Targets: 500 Achieved: 184

HH Access Electricity

Targets: 60,800 Achieved: 24,552



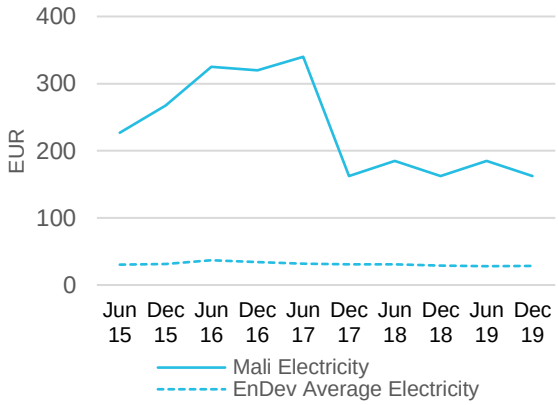
PU Access

Targets: 460 Achieved: 64

Additional info

- **HH Access Cooking**: The ICS component of EnDev Mali is a new component that has only started end of 2019 to be implemented by SNV. Initial work on national ICS quality and labelling as well as a baseline study were necessary to lay the ground for sound future development of the ICS market in Mali.
- **HH Electricity Access** figures are raising in 2020 faster than planned as the picoPV market on household level is expanding and first results from the north of the country are expected in the second half of 2020.
- **SI Access:** EnDev's support to electrify rural clinics is crucial and only started in the second half of 2019. Since then nearly 500 out of 738 identified clinics have been connected by off-grid solar. Additionally, EnDev is strengthening the sustainability of the installation through the training of local technicians and by forging multiple partnerships with organisations interested to addressing the energy needs of health facilities. Promising discussions with the WFP have been initiated on the promotion of ICS for school kitchens.
- **PU Access:** Productive use of electricity is a new focus area of EnDev Mali only since June 2019. A number of picoPV/SHS interventions, which triggered PU, where previously not counted as PU Access, but will contribute in the future to achieving target figures. Opportunities for cotton oil processing are explored by SNV.

Efficiency



Additional info

- **Cooking efficiency:** Results of the new cooking component will only be available in the second half of 2020.
- **Electricity efficiency:** In Mali additional security costs have to be considered especially in the red areas where GIZ intervenes (e.g. electrification of health centres, and NIS electrification activities in the vulnerable settings in North Mali). EnDev Mali observes in 2020 a persistent trend of improved cost efficiency which started in June 2019. This is related to the cost efficiency of the integrated approach for electrification in the Baroueli region, resulting from several partnerships with international organizations, private sector and local governmental agencies to develop the solar market with a range of different off-grid technologies.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

The electrification rate in rural areas of Mali is low (about 18-20%). **Mini-grid development** is an important off-grid electrification option; however, cost effectiveness remains an issue for the sustainability (and expansion) of mini-grids. EnDev is in discussions with the Department or Energy (DNE/Direction National de l'Energie) with regard to PV feed-in tariffs for mini-grids. Attractive feed-in tariffs for mini-grids would allow for more private investments. While the **picoPV market** development is reaching expansion phase the market share for larger **SHS systems** for multiple lights and/or televisions is still limited but expected to grow rapidly. The new PAYGO scheme for SHS is expected to increase the demand drastically. Additionally, EnDev Mali cooperates with EnDev Benin to verify whether solar companies from this country are interested in getting into the Malian market. Solar panels are generally available at local markets, yet quality SHS including batteries, cabling etc. are still not easily available in rural areas; even less in vulnerable settings. EnDev's support to the electrification of rural clinics confirms these quality problems underlining the importance of quality assurance systems. Based on the analysis of EnDev at 500 rural clinics (which had been formerly equipped in the frame of a government programme), average costs for the repair of the solar systems and installation of additional capacity are estimated nearly similar to complete new installations. The importance of an **enabling environment** was recently demonstrated when a temporarily absence of tax exemption on renewables (9 months) resulted almost in a shut-down of two picoPV companies.

Cooking Sector

The market for **clean cookstoves** is dominated by low 1- to 2-tier stoves. In the past, many awareness activities had been carried out resulting in widely known benefits of ICS. However, quality assurance and ICS labelling remain key challenges. As a consequence, some stoves of minor quality are unjustly considered as ICS which creates also problems for an analysis of the status of the ICS market. R&D on **alternative fuels** such as bio-ethanol and briquettes including the development of business models is being supported by EnDev in cooperation with local companies, the national agency for biofuel (ANADEB) and a number of NGOs. Pilots will provide insight of future market potential.

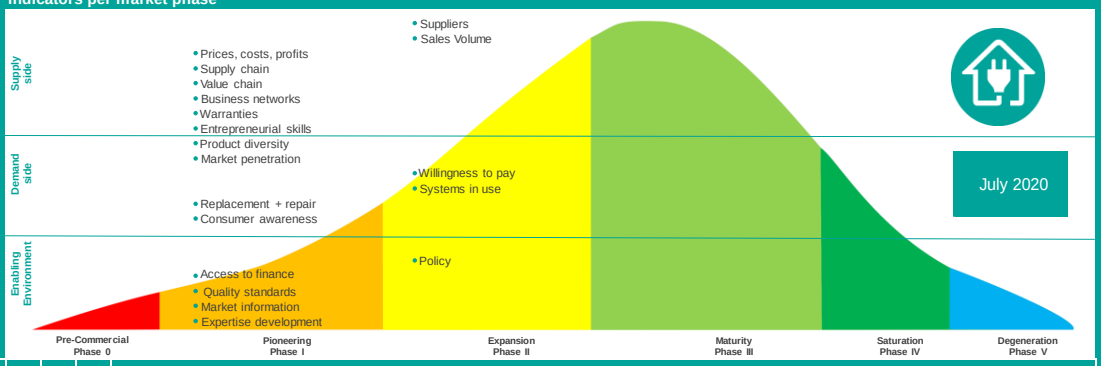
Impact of COVID-19

COVID-19 does only have a minor impact on the market for ICS and picoPV as the country is regularly affect by crisis. Generally, the COVID-19 crisis impacts more on international private investments, logistics and chains of command which might also impact the progress of electrification through mini/nano-grids.

Summary EnDev Market Scorecard: Mali July 2020 Solar Products

Market: Pico PV market starts to get more dynamic with more companies, brands and choice in products with pay&go. RBF worldbank helps to launch new brands in market. Rural networks, company skills, client awareness, repair&recycling for increased sustainability still to be improved.

Indicators per market phase



Market trends

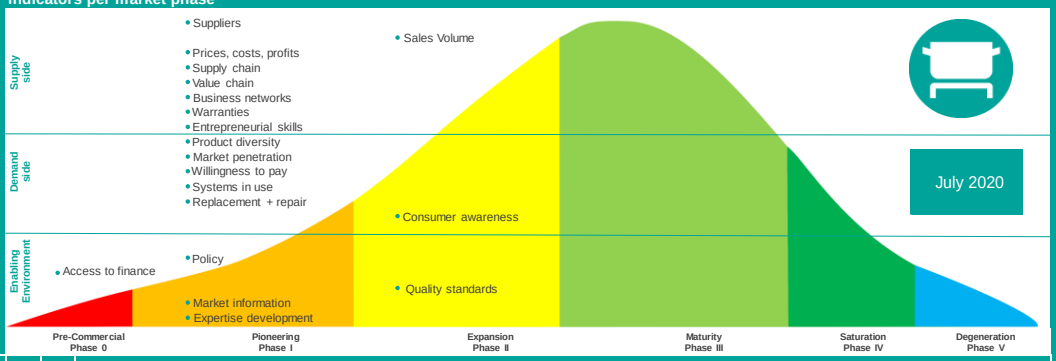
Positive ↑
Slight positive ↗
Stagnation →
Slight negative ↘
Negative ↓
Conflicting ↔
Unknown ▽
Not measured ▯
Doesn't apply ▪

Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	→	→	Uncertainty about renewal of tax exemption until March (lots of funds lost in storage at customs) and security issues, combined with COVID-19 (international investments required yet lacking advancement). Two enterprises are more social of kind and might get into trouble as result of this.
	S1V2	Business modalities	↗	↗	↗	
	S1V3	Formality	↗	→	→	
	S1V4	Jobs created	↗	↑	↗	Though COVID-19 creates oppertunities for pico PV (easy to install) - combined with the actual state of the country, few companies put staff on technical leave. Others (more comermcial ones) are doing okay.
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↗	the companies intervening in the north experience reduction in sales -difficult to work on the field due to security. In the south still ok though.
	S2V2	Inventory turnover	↗	↗	↗	One having trouble cathing up with market. Two doing good. Two doing ok. Demand still exceeds stock.
S3 Prices, costs and profits	S3V1	Prices	↗	↗	↗	Two companies have more comermcial prices and at least one company uses WB RBF to subsidise product for end-user (and probably will stop after batch is finished).
	S3V2	Costs	↗	↗	↘	penetrating rural areas got more expensive - public transport less feasible and fieldtrips take more time in smaller groups
	S3V3	Profit margin	↗	↗	→	exact margins per product known for few companies only
	S3V4	Investments	↗	→	→	no newcomers/new investors seen at present - this is one of the critaria that will be affected by COVID-19/security issues
S4 Supply chain and after-sales service	S4V1	Length	↗	→	→	one only seeking to work with independant distribution network (anot working at present). All others do everything themselves
	S4V2	Distribution channels	↗	→	→	getting stronger yet still weak in rural areas/north of the coutry
	S4V3	Spatial reach	↗	↗	→	insecurity increases and affects mobility/spatial reach
	S4V4	Initial suppliers	▽	↗	↗	
	S4V5	After-sales service	→	↑	↑	accentuated by EnDev and getting better (beyond guarantee) for most companies
S5 Value chain	S5V1	Value added	▽	↗	↗	
S6 Business networks	S6V1	Networks	↗	→	→	EnDev is only one trying to stimulate this yet no networks are being established beyond the direct proximity of the project. Newcomers seek networks for easy market entry while old ones seek to protect theirs. We need more newcomers/growth for this
	S6V2	Partnerships	→	↑	↗	first two high level partnership manufacturer/distributor - rest still to come
S7 Warranties	S7V1	Warranties	↗	↑	↑	Lighting global is obliged to do so. Positive trend noted as service after guarantee is developing and traditional SHS (with good quality, so max 20% of full market?) also starts to offer some guarantees.
S8 Entrepreneurial skills	S8V1	Financial literacy	→	↗	↗	very low yet EnDev offers a lot of input and trains staff on request to develop this (two companies replied to offer and have improved skills/sales - mostly by correcting promotional activities in the field)
	S8V2	Satisfaction level	→	↑	↑	for those with finacnial capacity to act; positive. For others; difficult as they have difficulty stepping up to the market
	S8V3	Marketing skills	→	↑	↑	one company really gets the trick, another tries and the rest does apply good skilld in the field (EnDev learns that) yet no real marketing abilities (EnDev can advice but does not facilitate this)
	S8V4	Advertising	→	↗	↗	
	S8V5	Production automatization	→	↗	↗	
	S8V6	Standardized production	▯	▯	▯	pico PV imported; not produced at place
D1 Product diversity	D1V1	Diversity	↗	↑	↑	more and different offers being introduced and specific needs being reflected upon
D2 Market penetration	D2V1	Market penetration	↗	↑	↑	SHS is definitely higher (reaching users that would not have had SHS for TV) yet pico PV is just over 5%, yet TV offer creates new market in rural areas 10%. In the north of the country <5%. Allover positive trend towards expansion phase
D3 Willingness to pay	D3V1	Willingness to pay	↗	↗	→	insecurity rising since elections in march, discussion around cashcrops like coton result in intention to plant less coton and reduced willingness. In middle/norht of the country interventions start to get more humanitairian (farmers not being able to work on field for 2nd year in row)
D4 Systems in use	D4V1	Usage rate	↗	↑	↑	
	D4V2	Maintenance	→	→	→	some people know too well and move around and/or disappearing with pay&go systems, potentially getting companies in trouble
D5 Replacement and repair	D5V1	Replacement rate	↗	↗	↗	people generally do seek to replace systems, depends finacial capacities and (increased) acces to products
	D5V2	Repair rate	→	↗	↗	EnDev intervenes to imrpove this and slighty going forward - at least companies are conscient that repair beyond guarantee is necessary (for the environment and) dor clients to trust them
D6 Consumer awareness and perception	D6V1	Awareness	→	↑	↑	not or positively affected by crisis, pico Pv well placed in urgency interventions
	D6V2	Perception	↗	↑	↑	not or positively affected by crisis, pico Pv well placed in urgency interventions
E1 Policy	E1V1	National plans	→	→	↘	general plans do exist yet strategies to reach those plan got blocked over the last couple of years and as there is no functional government since march 2020….
	E1V2	Policy	↗	→	→	general plans do exist yet strategies to reach those plan got blocked, there is no functional government at present yet policy pico Pv not negatively affected either - just stagnating….
	E1V3	Product taxes	→	↓	→	tax exemption discussed anf renewed, can only get better with control of quality before application of exemption (reason stagnation as trend)
	E1V4	Business taxes	→	→	→	not badly arranged and new comapnies are exempted for determined numer of time (depending structure)
E2 Access to finance	E2V1	Subsidies	↗	→	→	international donor programs expected to reduce though ilmportant climate programs do get announced, this is not linked to the specific sector (yet)
	E2V2	Financing options suppliers	↗	↗	↗	not yet affected really though local banks are not in an easy situation
	E2V3	Financing options consumers	↗	↗	↗	improved over the years. Micro credits and banks do offer facilities (attrativeness to be improved yet at elast they exist). Not affected though expected to get used even less…
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	↗	↗	lighting global exists yet otherwise all can be imported, sold and used
	E3V2	Enforcement	→	↘	↘	few LG certified products did not pass tests at EnDev - there is labeling going on yet physical tests are lacking completely
E4 Market information	E4V1	Cost of information	▯	→	→	definitely donor funded at the moment and probably even concentrated at EnDev
	E4V2	Market facilitation organizations	→	→	→	planned yet not executed. Easy to start a companyt in Mali yet not easy to enter the specific market
	E4V3	Awareness campaigns	→	↘	↘	very little is done in communication about quality if not by EnDev and few other NGO's/companies. Governement has had other preoccupations last couple of years
E5 Expertise development	E5V1	Courses	→	↗	↗	more trainign programs coming navailable yet also from unspecialised organisations… slightly positive at best
	E5V2	BDT	▽	→	→	EnDev offers this yet others unknown
	E5V3	User training	▯	↑	↑	all companies contacted by EnDev understand the need to train users and have been explained how to do so - they also participated in field trips and continue this themselves. Yet still considered pioneering, general conscience still to be developed.

Summary EnDev Market Scorecard: Mali July 2020 Improved cookstoves

Market: The market described in this scorecard is related to household ICS (tier 1 and 2) in urban and peri-urban areas in the southern and western part of Mali (the EnDev intervention zone for this component)

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	Positive trend mainly regarding to retailers than to producers/suppliers
	S1V2	Business modalities	↗	↗	
	S1V3	Formality	↗	↗	
	S1V4	Jobs created	↗	↗	
S2 Sales Volume	S2V1	Products / services sold	↗	↗	
	S2V2	Inventory turnover	↑	↗	
S3 Prices, costs and profits	S3V1	Prices	↗	↗	No subsidies, but mostly prices are adapted to the market by lowering the quality
	S3V2	Costs	→	→	Limited economies of scale
	S3V3	Profit margin	→	→	Increase of margins basically through lower quality. For some stoves VERs
	S3V4	Investments	↗	↗	Investment in liner production, in R&D for pallet/briquet production and bio-ethanol cooking
S4 Supply chain and after-sales service	S4V1	Length	↗	↗	
	S4V2	Distribution channels	↗	↗	
	S4V3	Spatial reach	↗	↗	
	S4V4	Initial suppliers	↗	↗	rcycled iron is mostly used and supply is not well structured
	S4V5	After-sales service	↗	↗	
S5 Value chain	S5V1	Value added	↗	↗	
S6 Business networks	S6V1	Networks	↗	↗	
	S6V2	Partnerships	↗	↗	
S7 Warranties	S7V1	Warranties	→	→	
S8 Entrepreneurial skills	S8V1	Financial literacy	→	→	
	S8V2	Satisfaction level	↗	↗	
	S8V3	Marketing skills	↗	↗	
	S8V4	Advertising	↗	↗	
	S8V5	Production automatization	↗	↗	
	S8V6	Standardized production	↗	↗	
D1 Product diversity	D1V1	Diversity	↗	↗	
D2 Market penetration	D2V1	Market penetration	↗	↗	For certain stoves (SEWA/WASSA = ceramic liner stoves), demand exceeds supply capacity (only available in Bamako)
D3 Willingness to pay	D3V1	Willingness to pay	↗	↗	
D4 Systems in use	D4V1	Usage rate	↗	↗	
	D4V2	Maintenance	↗	↗	
D5 Replacement and repair	D5V1	Replacement rate	↗	↗	
	D5V2	Repair rate	↗	↗	
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	Awareness on the principle of ICS exist, but little awareness on the quality
	D6V2	Perception	↗	↗	
E1 Policy	E1V1	National plans	→	→	National targets are in place, but no clear strategy how to meet them
	E1V2	Policy	↗	↗	
	E1V3	Product taxes	→	→	Not importrant for the moment, no import
	E1V4	Business taxes	→	→	
E2 Access to finance	E2V1	Subsidies		▽	ICS have been highly subsidized in the past (2010-2015), but this is now countereffective
	E2V2	Financing options suppliers	→	→	
	E2V3	Financing options consumers	→	→	
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	↑	Part of the EnDev programme
	E3V2	Enforcement	↗	↗	
E4 Market information	E4V1	Cost of information	↗	↗	
	E4V2	Market facilitation organizations		▽	
	E4V3	Awareness campaigns	↗	↗	
E5 Expertise development	E5V1	Courses	→	→	
	E5V2	BDT	↗	↗	
	E5V3	User training	↗	↗	

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Continued support to a demand oriented **(integrated) approach** for sustainable electrification in selected regions to increase synergies and improve strategies at national as well as on local level. • Further support to the **Regulatory Committee** with regard to a quality assurance system for ICS market development (development of a ICS labelling system based on the new ISO standard). • Assisting the **Mali Alliance for Clean Cooking** in becoming an inclusive platform for sector actors.
Supply side	• Boost incentives for sustainable **repair and recycling systems** for solar technologies. • Continued support to **identify potential for (private) investments** in solar systems to serve rural areas, e.g. through provision of market information. • **Extension of the ICS component** to the vulnerable regions in the north. • Support to increased local **ICS testing capacities** especially with regard to health issues. • Introduction of RBF incentives to increase availability of quality **higher tier cookstoves** in regional towns. • Use of synergies of **solar technologies and ICS** and creation of (PAYGO) incentive systems for “package solutions” (including PU & higher tier ICS). • Support to testing and piloting **alternative cooking fuels** (bio-ethanol, briquets) for households and for PU (e.g. in bakeries, restaurants etc.). • Support to a **biodigester programme** and creating synergy with the ICS and the picoPV components (as of 2021).
Demand side	• Support to **awareness creation** on simple low-cost cooking solutions in rural areas and vulnerable settings (e.g. rocket stoves). • Improving **know-how on costs, benefits, availability** of quality solar equipment reaching last mile. • Up-scaling demand in **vulnerable settings in the north of Mali** using experiences from southern regions (Baroueli) including introduction of higher tier solutions, mini-grids etc. • Up-scaling of **health clinic interventions** in partnership with the World Bank COVID-19-Response programme and others.

Mozambique

Section 1: Key facts

Country facts	
Population	29.5 million
HDI	180 ↑ | Total (0.45)
UN Classification	LDC
Access clean cooking	12 % urban < 5 % rural
Access electricity	72 % urban 8 % rural

Project facts	
Project Period	10.2009 - 06.2021
Budget	EUR 27,509,000
Core funding incl. RBF	EUR 18,576,000
Earmarked	EUR 8,933,000
Average annual turnover	EUR 1,503,032
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio

Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• Having been the main energy access project in Mozambique and working already since 2009 in the country EnDev is a **central actor and contact** for the government and other national and international actors. • The Government of Mozambique has the objective to achieve universal access to energy by 2030. In rural areas about 50% of the population shall be connected to the grid, while the rest is targeted with decentralized solutions leaving a large **potential for climate-friendly, renewable energy solutions**. • EnDev contributes directly to achieving these objectives by strengthening **market development and private sector actors** (focus on solar PV and improved cooking). • EnDev Mozambique's strategic orientation is fully in line with both EnDev's and the Government's ambitions targeting mostly the impact area **Energising Lives and Energising Climate** – while activities in the field of productive use of energy are implemented by the sister program Green People´s Energy (GBE) supported by the German BMZ.
Contribution to paradigm shift	• Piloting EnDev´s first locally anchored **basket fund** for support of energy access projects in Africa (next to the one in Bolivia, Peru and Central America) EnDev Mozambique is preparing the ground for future exponential growth and market development. • Support to **picoPV/SHS market transition** and to cover large, remaining market for these technologies in neglected rural areas. • **Professionalisation of business practices and manufacturing processes** plays a pivotal role working with the private sector focussing on viable and new business models, targeted capacity building and training and establishing local manufacturing sites that follow high production and assemble standards. • The project pilots first steps to a **higher tier ICS market** development with higher lifespan and quality of ICS. • Further transition of markets is supported through active contribution to discussions on policy and regulatory level in the frame of the **Energy Sector Technical Working Group** bringing together members of the donor community and invited government representatives.

Important collaborations for scaling up	**Funding and investment** • **EU co-financing for COVID-19 mitigation measures** (5 Million Euro, in preparation). • **Norwegian Aid**: funding of COVID-19 mitigation measures (6 Million Euro). • **BMZ special fund** for mitigating the impact of tropical cyclones 2019 (3 Million Euro). • Respective international funding will partly be channeled through the the basket fund "**Fund for Sustainable Access to Renewable Energy (FASER**)", established by EnDev in cooperation with the local **Foundation for Community Development** (FDC); the fund is open for funding from other projects, implementers and donors, EnDev ensures high quality of monitoring and verification of results.
	Implementation • Use of synergies and complementarities for scaling with all **GIZ energy projects** in Mozambique (EnDev, Green People´s Energy, GET.invest/GET.transform) through the **Energy Cluster**. • Close alignment of EnDev and **Green People's Energy (GBE) project** focusing on productive use and energy access to social institutions through shared, efficient project management structure. • In the framework of GIZ's strategic alliances with the private sector, EnDev Mozambique cooperates with GIZ's global **E4D programme** to promote job creation along the energy value chain; 82 jobs and access for 5.300 families have jointly been achieved. • Strategic cooperation planned with the **World Food Programme (WFP)** and the **Ministry of Education** to promote the use of improved institutional kitchens in the framework of the national school feeding programme.

	Knowledge sharing and learning • EnDev Mozambique plays a crucial role in leading the national debate on how to achieve universal access and ensure knowledge transfer. Once per year, EnDev organizes an **Energy Sector Stakeholder Workshop**, which brings together key stakeholders. Topics discussed include relevant ongoing and necessary policy developments and their impact on the private sector. • The workshop facilitates also **B2B exchanges between stakeholders** in order to create synergies, especially in less attractive remote areas, and encourages the introduction of new business models such as bundling of ICS and solarPV. • EnDev Mozambique continuously exchanges critical market information and insights gained from studies in technologies and markets with other programmes such as the **World Bank's ProEnergia and FCDO's BRILHO programme** (e.g. EnDev is currently coordinating the establishment of a digital system to cross-check energy access data across programmes to avoid double reporting of results).
Gender	• A **gender analysis** was conducted in 2019 in the framework of the appraisal of the Green People´s Energy country project, which covers gender considerations for Mozambique's energy sector as a whole and is equally applicable to EnDev. To promote the uptake of decentralized RE technologies by women-led households, EnDev Mozambique included a **gender incentive within all its RBF approaches.**

Consideration of ITAC recommendation

Adjustment of project strategy and approach: During the programming cycle conducted in 2019 ITAC acknowledged the need to adjust the project strategy and approach due to an unforeseeable crisis situation. In March 2019 the tropical cyclone IDAI hit the coast of Mozambique and devastated several provinces of Mozambique, when the project proposal and programming cycle was almost completed. Hence, the project was given freedom to adjust the approach and focus on contributing to overcome the crisis situation.

Gender: A gender analysis was conducted in 2019 as part of the appraisal of the Green People´s Energy country project as mentioned above. EnDev continuously promotes the employment of women along the whole value chain in the market for solar PV and ICS. Most women were trained in collaboration with the Green People´s Energy Project. This resulted in women employment rates in the distribution teams of the implementing partners of more than 50%, duly considering risk mitigating measures by employing gender mixed teams in the field. Additionally, a gender incentive is included in EnDev Mozambique´s agreements with other implementing partners, such as to promote the increased uptake of the technologies by women through e.g. special conditions for women-led/single households.

Vulnerable groups: In 2019, EnDev Mozambique redirected its approach to work hand in hand and complementary to humanitarian organization (UNHCR, UNICEF, Save the Children, other NGOs) and emphasized its focus even more on vulnerable target groups. To fast track implementation and build local capacity, the basket fund FASER was extended to include a humanitarian financing window. This financing window is focused on supporting companies to provide energy in humanitarian settings where the cyclones in 2019 hit the hardest and destroyed houses, businesses, and infrastructure. Further, EnDev ensured the continuity of the companies' operations in the provinces affected by the cyclone as well as the access to energy for the affected populations.

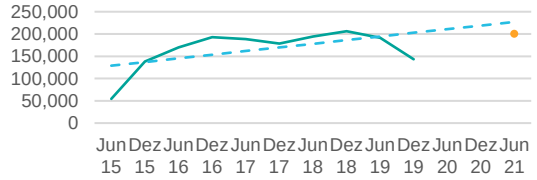
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

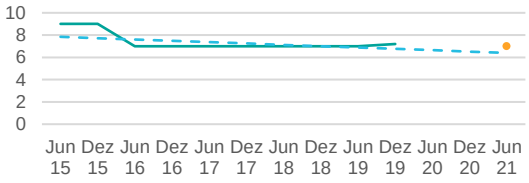
HH Access Cooking

Targets: 200,000 Achieved: 143,303



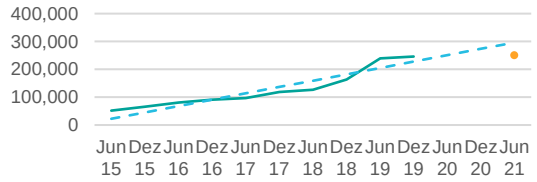
SI Access

Targets: 7 Achieved: 7



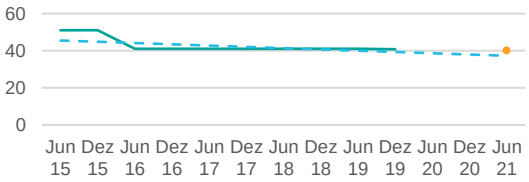
HH Access Electricity

Targets: 250,000 Achieved: 245,876



PU Access

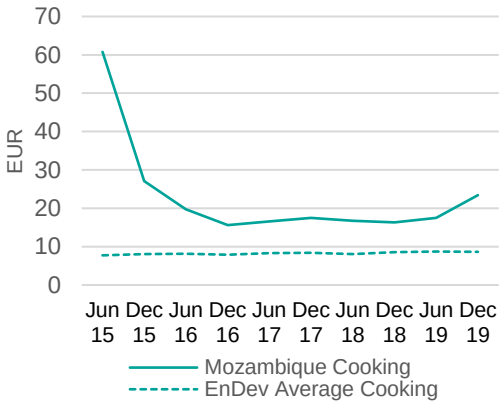
Targets: 40 Achieved: 41

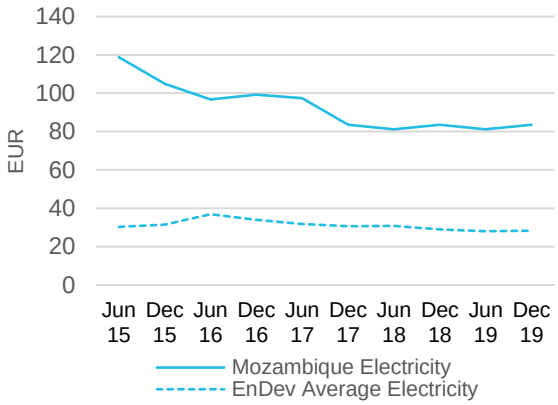


Additional info

- Due to the crisis in 2019 (two tropical cyclones) and 2020 (COVID-19) **targets** for Mozambique from previous programme planning were **yet not changed**; given the present situation with the COVID-19 pandemic this will happen in the frame of the next programming exercise 2020/2021. The targets presented above are meant to provide a point of reference but should be understood as estimates.
- Slightly declining achieved figures for **cooking and electricity** due to the two tropical cyclones which hit the country in 2019.
- **SI and PU access** target figures were always low due not to being focus areas in Mozambique; with Green People's Energy project starting activities in 2019 it was agreed that this project will focus on SI and PU access; close exchange with EnDev is ensured through shared project management structures.

Efficiency





Additional info

- Recent rise in costs in the **cooking sector** due to natural crisis in 2019; additionally, high share of **higher tier ICS** in results leads to higher average costs per person, while increasing positive impacts and lifespan.
- TA for local ICS production in standardization of the production process has brought the **lifespan of the ICS technology** up from two to four years, which has been confirmed by studies in the field. The new 4-year lifespan of ICS will improve the overall cost efficiency of ICS per HH significantly.
- **Electrification cost-efficiency**: The seemingly low cost-efficiency for electrification is largely due to costs for micro-hydro-projects (MHP) which were phased out. Without the MHP component the average costs per household are below 50 EUR.
- Relatively high costs in the electricity sector due to **early stage of solar/ SHS market**, with few companies involved and where developing market infrastructure and stimulating demand is cost intensive.
- High cost efficiency in **higher tier electrification** (grid densification through support of connection, especially for vulnerable groups, single mother households etc.); decrease of cost per household for grid connections reduced from 29 Euros in Dec 2017 to 17 Euros in Dec 2019.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

Grid densification: The market for on-grid electrification is managed by the National Electricity Utility (EDM) with a capacity to connect a maximum of 300.000 customers per year – potentially reaching up to 50% of the population until 2030. To overcome the financial barrier of high connection fees, EnDev assists to connect low-income households with prepaid metering. This effort is complemented by other donors such as the World Bank.

Solar PV: The solar PV market has a potential of more than 2 million households in the long run. However, this market is in an early stage of development and the low purchasing power of the population makes innovative end-consumer-financing solutions a key to success. To address this barrier EnDev - in cooperation with the Green People´s Energy Programme - set-up the RBF-Fund FASER which incentivizes businesses to reach out into less favorable markets using innovative financing schemes such as PAYGO. FASER provides as first locally anchored basket fund in the EnDev portfolio in Africa results-based funding for energy access projects. It is structured along various financing windows ranging from general market development to humanitarian windows as a response to crisis situations like tropical cyclones or the COVID-19 pandemic.

Cooking Sector

For more than 80% of urban and 95% of rural households, biomass is the primary cooking energy. In urban areas biomass fuel is rather expensive and consequently, demand for ICS is high, while being lower in rural areas where e.g. firewood is collected for free. To reach customers in both market segments, EnDev promotes artisanal, semi-industrial and industrially produced cookstoves to address different price segments and customer preferences. EnDev particularly encourages the bundling of ICS and SHS, supporting its partners in establishing strategic partnerships and to develop joint PAYGO models. ICS producers do not have the financial capacity to offer consumer financing, so they can benefit from the PAYGO financing schemes that solar PV companies offer to customers. The bundling allows for an integrated marketing of both technologies, offering households in rural areas a wholesome shift to a more “modern”, efficient and qualitatively better energy provision, while only having to deal with one counterpart. Making the direct link to climate change mitigation EnDev supports ICS companies working with carbon credits to set up production of gold standard compliant cookstoves. With hindsight to the low purchasing power, EnDev also supports the market-entrance for LPG-based pay-as-you-cook businesses on a pilot scale to learn more about the sector and gather experience to feed into the learning process on higher-tier cooking on global program level. Scaling of LPG is not foreseen.

Impact of the COVID-19 pandemic

In both sectors, solar PV and clean cooking, there is a strong impact of the COVID-19 pandemic on purchasing power, leading to a reduced uptake of technologies, which consequently caused a reduced cash-flow for the companies. To address these negative impacts, EnDev introduced as a short-term response measure the new financing window COVID-PAY in FASER. This new window aims at improving business continuity for companies and to ensure the continuity of existing energy access for the clients.

Summary EnDev Market Scorecard: Mozambique July 2020 Improved cookstoves

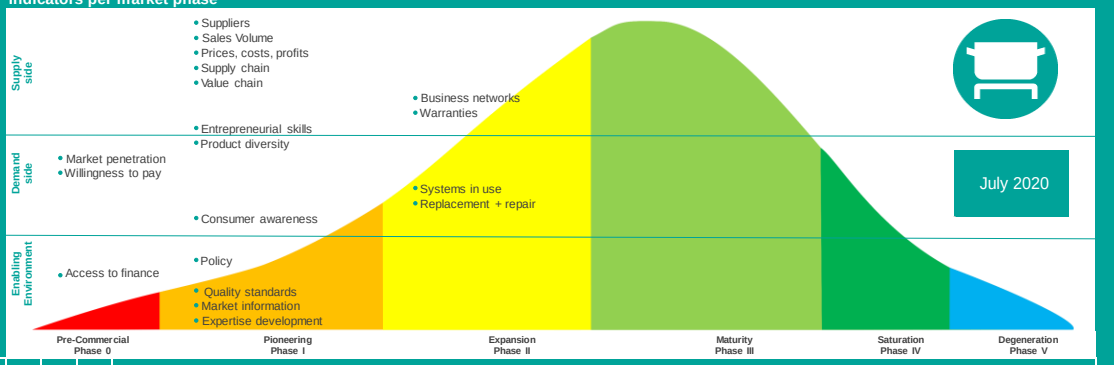
Market:

- Technologies: imported and locally produced household charcoal- and wood-fuel improved cookstoves
- Geographical coverage: urban, peri-urban and rural areas in Mozambique
- Business models: credit-based PAYGO (bundling with solar) and instalment-based sales, OTC and carbon-credits schemes.

Market trends

Positive ↑
Slight positive ↗
Stagnation →
Slight negative ↘
Negative ↓
Conflicting ↔
Unknown ▽
Not measured ▯
Doesn't apply ▪

Indicators per market phase



Indicators	Variables		2018	Mar 2020	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↑	→	Businesses have not closed operation, but reduced production. No new company has entered the market in 2020.
	S1V2	Business modalities	↗	↑	→	no changes of business modalities, but limited prospects
	S1V3	Formality	↗	↑	→	No new businesses are entering the market, therefore no new registrations
	S1V4	Jobs created	↑	↑	↓	Fewer jobs due to the reduction of activities for some companies. (Contrary to the benchmarks, businnesses are no unipersonal commercial activity as - for now - they have kept their level of employees.)
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↓	The sales volume reduced: in March 2020, businesses reported only 400 stoves/month, that is a 64% reduction compared to the average monthly sales of 1100 stoves in 2019. Reduced production capacity and sales, as door-to-door sales are only possible to a limited extent.
	S2V2	Inventory turnover	↑	↑	↓	Due to closed borders, it is not possible to import some raw materials and therefore there is a low rate of stock rotation.
S3 Prices, costs and profits	S3V1	Prices	↗	↗	↘	Prices remain the same now, but customers' ability to pay has decreased, which makes the stoves more expensive.
	S3V2	Costs	↗	↑	↘	Cost of stoves are still the same as before.
	S3V3	Profit margin	↑	↗	↓	Businesses are selling fewer stoves, profits are lower.
	S3V4	Investments	↗	↑	↓	No investments at the moment
S4 Supply chain and after-sales service	S4V1	Length	↗	↑	→	No new businesses entering the supply chain of stoves.
	S4V2	Distribution channels	↑	↑	→	Distribution channels established have not changed.
	S4V3	Spatial reach	↗	↑	→	Currently sales are made locally and companies are not in the process of expansion to other, new regions.
	S4V4	Initial suppliers	↗	↑	↗	Businesses still find the materials on the market but they may have financial limitation.
	S4V5	After-sales service	↑	↑	↘	Limitations even increased due to the limitation on mobility by customers and businesses
S5 Value chain	S5V1	Value added	↗	↑	→	Value added is not changing, but volume of total value added within the supply chain is decreasing.
S6 Business networks	S6V1	Networks	↑	↗	→	Businesses expect to have more network options via online platform (e.g. stakeholder meeting)
	S6V2	Partnerships	↑	↑	↑	Remain the same as before
S7 Warranties	S7V1	Warranties	↗	↑	↑	The guarantees remain the same, but due to mobility limitations it is even more difficult to respond in case of replacement/repair.
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	↑	→	the support on the business development is limitated. the number of training courses in the financial area has been reduced.
	S8V2	Satisfaction level	↑	↑	↓	The uncertainty level is really high among the businesses.
	S8V3	Marketing skills	↑	↗	→	The obtained skills are still the same as before the crisis.
	S8V4	Advertising	↑	↗	→	Businesses had to reduce advertsing, but advertising is there. (In contrary to the benchmark, advertisment is not done/funded by donors)
	S8V5	Production automatization	↗	↑	↗	Maybe the social distancing regulations leads to reinventions even by small scales producers. Plans to invest in new prodcution lines (as optimization) are postponed.
	S8V6	Standardized production	↑	↑	↑	no changes expected
D1 Product diversity	D1V1	Diversity	↑	↑	↗	Difficulty/inability to import stoves. Therefore the number of different type is even more limited at the moment.
D2 Market penetration	D2V1	Market penetration	↗	↑	↗	No changes: still huge untapped market share for ICS.
D3 Willingness to pay	D3V1	Willingness to pay	↗	↑	↓	No information about WTP changes, however, the ability to pay is even lower as income of potential customers is reduced. (First test runs to bundle ICS with solar PAYGO products to "get a stove in addition to a SHS that is paid in steps" - ICS maybe percieved as a goodie)
D4 Systems in use	D4V1	Usage rate	↑	↑	↑	No changes: high usage rate assumed
	D4V2	Maintenance	↑	↑	↗	User trainings on how to maintain the stove can only be delivered to a lesser extent, therefore maintenance knowledge by users might go down.
D5 Replacement and repair	D5V1	Replacement rate	↑	↑	↗	Due to mobility limitations, fewer replacements might happen. Broken stoves are in use. (Understanding replacement here: a new product after the life-span has ended).
	D5V2	Repair rate	↑	↑	↘	Due to transporation and mobility limitations, fewer replacements migth happen. People might continue using their broken stoves.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↗	No changes in terms of awareness level, but awareness and marketing campaigns will not have the same reach as before.
	D6V2	Perception	↑	↑	↑	No changes
E1 Policy	E1V1	National plans	▽	↑	↓	No changes: no national targets for stoves
	E1V2	Policy	▽	→	→	No changes: nopolicies
	E1V3	Product taxes	▽	↓	↓	No changes: no tax relieves
	E1V4	Business taxes	▽	↑	↑	Majority of businesses pay taxes, even informal ones due to an easy system. There are no tax reliefs for ICS businesses.
E2 Access to finance	E2V1	Subsidies	↗	↑	↓	Donor driven subsidies are increased during COVID-19. Endev: incentives are paid to consumers and businesses for rural areas.
	E2V2	Financing options suppliers	↗	↘	↓	No changes: FI are not interested in ICS, no chance for businesses to get any loans. VCI (by KfW) offers a credit line but even biggest ICS companies are not elegible.
	E2V3	Financing options consumers	↗	↑	↑	Installment times for some customers have increased, from 2 to 4 to take into account even less ability to pay.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	▽	↑	↗	Focus might shift within the Government, due to COVID-19 related issues.
	E3V2	Enforcement	▽	▪	▪	No changes: no regulations
E4 Market information	E4V1	Cost of information	↑	↑	↑	No changes: Donors share information with sector participants.
	E4V2	Market facilitation organizations	↗	↗	↗	No changes: Renewable energy association AMER is not involved with ICS yet.
	E4V3	Awareness campaigns	▽	↓	↓	No changes: There are no campaigns on Governement level. It is not likely to change.
E5 Expertise development	E5V1	Courses	▽	↑	↓	No trainings happening at the moment; only in very few occations.
	E5V2	BDT	↗	↑	↑	EnDev provides special extra support to assist with financial statements for all partners, on a Rotating basis.
	E5V3	User training	↑	↑	↑	No changes: In case of sales, users are still trained on usage and maintenance.

Summary EnDev Market Scorecard: Mozambique July 2020 Solar Home Systems

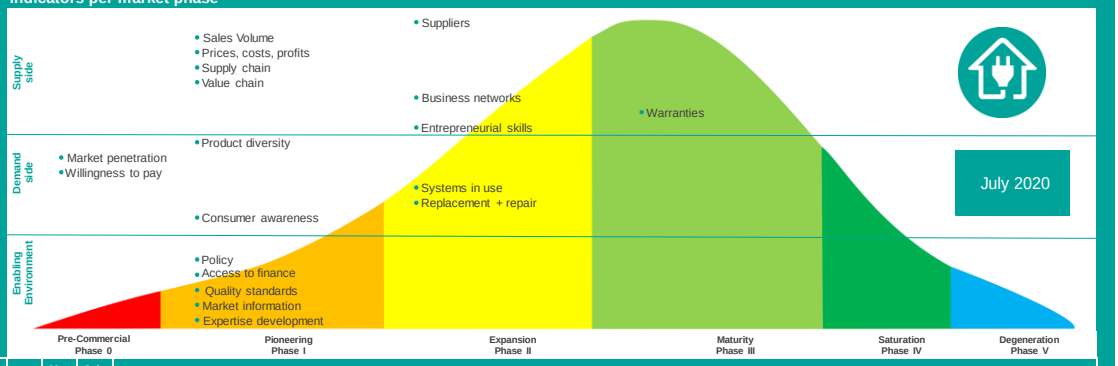
Market:

- Technologies: plug&play Solar Home Systems (SHS)
- Geographical coverage: off-grid areas of the rural and peri urban zones in Mozambique
- Business models: credit-based PAYGO

Market trends

Positive ↑
Slight positive ↗
Stagnation →
Slight negative ↘
Negative ↓
Conflicting ↔
Unknown ▽
Not measured ▯
Doesn't apply ▪

Indicators per market phase



Indicators	Variables		2018	Mar 2020	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↑	↗	Survey with 14 companies: stated financial problems (only 3 month); new companies are reluctant to enter the market.
	S1V2	Business modalities	↗	↑	↑	New business models appeared as an answer due to COVID-19. Innovation: E.g. Power-Blox inclusion of disinfectant production device with SHS.
	S1V3	Formality	↗	↑	↓	No changes of formality of businesses, however, not many other companies will join in the next months.
	S1V4	Jobs created	↑	↑	↓	No new hires.
S2 Sales Volume	S2V1	Products / services sold	↑	↑	↓	The impact of COVID-19 is different for each company. Some sell more, some less than before. On average, sales volume heavily reduced.
	S2V2	Inventory turnover	↗	↑	↓	Inventory turnover rate is lower than before. Import is even more difficult now than before.
S3 Prices, costs and profits	S3V1	Prices	↗	↑	→	Prices have not changed but customer's ability to pay has reduced. Prices are still high.
	S3V2	Costs	↗	↑	↓	Depreciation of local currency is affecting import of SHS leading to high costs
	S3V3	Profit margin	↗	↗	↓	Revenue per unit sold is reported to go down.
	S3V4	Investments	↗	↑	↓	Insecurity of businesses; majority are not making decisions about investments. Public funding could support the companies to overcome the COVID-19 impacts.
S4 Supply chain and after-sales service	S4V1	Length	↗	↑	↗	Expansion of distribution channels by companies is slower than in the past.
	S4V2	Distribution channels	↗	↑	↑	Existing distribution channels are in place. Sales are reduced at sales points because of lack of stock.
	S4V3	Spatial reach	↑	↑	↓	Businesses have to retract their spatial reach due to transportation issues because of travel restrictions during the state of emergency
	S4V4	Initial suppliers	↗	▽	▽	Products are imported from China, no production of SHS in Mozambique
	S4V5	After-sales service	↗	↑	↘	No changes: Although in some areas there might be still a lack of service providers in the market, customers can still find after-sales services especially for PAYG companies which give assistance by phone. Physical assistance is limited since health protocols have to be followed.
S5 Value chain	S5V1	Value added	↑	↑	↓	The value added is decreasing since companies along the distribution chain are selling less due to reduced stock.
S6 Business networks	S6V1	Networks	↗	↗	↗	The established Mozambique Renewable Energy Associatiom (AMER) could move faster.
	S6V2	Partnerships	↗	↑	↑	Partnerships in the sector still exist and could be bigger. EnDev tries to promote enhancing formation of partnerships among companies, with distributors and even NGOS.
S7 Warranties	S7V1	Warranties	↗	↗	↑	No changes: Warranties are an integral part of PAYGO by law.
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	↑	↑	The level of skill is not changed due to the COVID-19 crisis.
	S8V2	Satisfaction level	↑	↑	↓	Potential of shutdown limits the business endeavours therefore lowering expectations for future profits.
	S8V3	Marketing skills	↑	↑	↑	No changes, companies have the skills to do marketing.
	S8V4	Advertising	↗	↑	↗	Marketing campaigns like door to door are frozen due to movement and contact restrictions. Marketing is being done by merchandise articles, flyers, phone SMS communication and online social media channels.
	S8V5	Production automatization	↗	▪	▪	n.a.
	S8V6	Standardized production	▯	▪	▪	n.a.
D1 Product diversity	D1V1	Diversity	↗	↑	↓	Risk reduction leads to portfolio reduction and hence diversity reduction.
D2 Market penetration	D2V1	Market penetration	↗	↑	→	Market penetration is slower than in the past since ther is lower turnover and limited stock.
D3 Willingness to pay	D3V1	Willingness to pay	↗	↑	↓	Survey among 700 HH (COVID-19 survey) shows that they want SHS, however, the ability to pay is even lower as income of potential customers is reduced.
D4 Systems in use	D4V1	Usage rate	↑	↑	↑	Households are expected to use the systems even more frequently since families spend more time at home.
	D4V2	Maintenance	↑	↑	↑	No changes
D5 Replacement and repair	D5V1	Replacement rate	↗	↑	↑	Replacement is done as part of the warranty scheme offered by the companies. Regarding replacement at end of lifespan: Large majority of systems sold did not reach end of lifespan, hence replacement is a minor topic and not frequently observed in the market.
	D5V2	Repair rate	↑	↑	↑	Under the current situation it is complicated to reach the customers at home. They have to bring the old system to the store. Due to restrictions, only limited amount of repairs at the stores can happen.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↑	No changes.
	D6V2	Perception	↗	↑	→	Na change.
E1 Policy	E1V1	National plans	▽	↑	↑	No changes.
	E1V2	Policy	▽	↗	↗	No changes.
	E1V3	Product taxes	▽	↓	↓	No changes.
	E1V4	Business taxes	↘	↑	↑	No changes.
E2 Access to finance	E2V1	Subsidies	↗	↑	↑	Donors are in the process of setting up additional subsidy schemes to support the private sector during the COVID-19 pandemic. EnDev introduced the COVID-PAY window in FASER and additionally introduced temporarily the possibility of advance payments in the RBF Fund FASER.
	E2V2	Financing options suppliers	↗	↘	↓	No changes.
	E2V3	Financing options consumers	↗	↑	↑	No changes.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	↗	↗	No changes.
	E3V2	Enforcement	▽	▪	▪	No changes.
E4 Market information	E4V1	Cost of information	↗	↑	↑	No changes
	E4V2	Market facilitation organizations	↗	↗	↗	Increased activity of the existing organization
	E4V3	Awareness campaigns	▽	↗	↗	No changes
E5 Expertise development	E5V1	Courses	↗	↑	→	Training measures are currently set on hold during the COVID-19 pandemic.
	E5V2	BDT	↗	↗	↗	Overall situation did not change, however there is a switch to online trainings rather than presencial trainings.
	E5V3	User training	↗	↑	↑	No changes

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Supporting the Government of Mozambique in the revision of the **National Electricity Law** with regards to including renewable energies and facilitating the participation of private sector companies opens up new potential for sector transition. • As an active member of the **national task force for tax and tariff incentives** for renewable energies, EnDev lobbies for tax/tariff reduction and contributes to a favourable market environment. • EnDev supports the set-up of a nationwide Geo Information System (GIS) mapping tool to **identify future potential for off-grid solutions**. The tool will facilitate the implementation of the national electrification strategy by identifying regions/locations best suited for grid expansion, mini-grids or individual off-grid renewable energy systems. • Further strengthening of EnDev supported infrastructure of quality-**test laboratories for ICS and solar PV** through improved national quality standards and processes will contribute to faster market development.
Supply side	• Tailored technical and financial **assistance to small businesses** (ICS and solar companies) to increase their outreach and improve their operations and to prepare them to absorb larger funding and upscale operations. • Promotion of **bankability of renewable energy businesses** such as to enable the upscale of activities by means of 3rd party funding by banks, investors etc. • Further encouragement of **bundling of ICS and SHS**, fostering its partners to establish strategic partnerships that benefit businesses and families (previous experience shows that households are more willing to invest in ICS/SHS packages than in individual solutions). • Support to the basket fund **FASER** in the acquisition of additional funding to **scale up incentives for companies** to expand operations to less favourable markets through RBF. • Ensuring business continuity for companies of solar PV and ICS during the COVID-19 pandemic through the **FASER financing window COVID-Pay.**
Demand side	• Consumer **awareness campaigns** regarding the benefits of ICS and solar PV products leading to more uptake of these technologies. • **Maintain energy access** for the clients of solar PV and ICS companies by reducing energy costs through the new FASER financing window COVID-Pay for a pre-defined limited time to build the bridge until the crisis will be overcome. Funds are implemented through the private sector and included into classic private sector promotional programmes to avoid disturbances in the customer relationship.

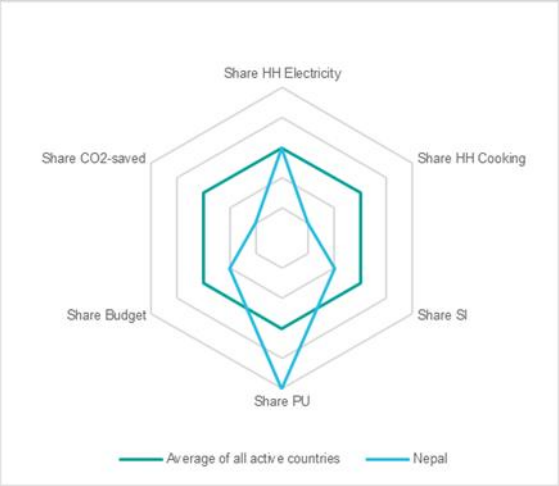
Nepal

Section 1: Key facts

Country facts	
Population	28.1 million
HDI	147 ↑ | Total (0.58)
UN Classification	LDC / LLDC
Access clean cooking	60.0 % urban 18.0 % rural
Access electricity	96.0 % urban 93.0 % rural

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
Implementer	GIZ, SNV, PA
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev is an **important partner to Government of Nepal** (GoN) to achieve energy and NDC targets (full energy access by 2030 with increasing renewable energy contribution to the energy mix). • **Leave no one behind (LNOB) focus** of EnDev, i.e. focus on energy access and clean cooking in rural and vulnerable communities most relevant for GoN development strategy. • High relevance of EnDev Nepal as **pioneer for commercially driven interventions** to promote access to modern energy (MHP, grid extension) and clean cooking solutions.
Contribution to paradigm shift	• Important role of EnDev for the transition of the ICS market to **higher tier stoves market development** including nascent electric cooking solutions and new fuel solutions (pellets). • Promotion of **Productive Use of Energy** especially in communities in remote areas through integration of agro-processing and micro-enterprises in the pico-hydro sector with potential. • Generally, higher tier access to electricity essential for **impact on economic development** (energy access until now focused mostly on tier-1 and -2 for lightning and other non-productive activities). • EnDev's *flagship* support to **Micro Hydro Power (MHP) in transitional phase**: supporting integration of promoted off-grid MHP plants into extending grid becomes important and has the potential for positive economic impact on local communities. • Promotion of **innovative approaches** like digitalisation of payment schemes in cooperation with the supported local Community Rural Electric Entities (CREE) with potential to speed up investments.
Important collaborations for scaling up	**Funding and investment** • Collaboration with **Nepal Electricity Authority** (NEA) to co-finance grid-extension especially in remote areas including set up of a revolving fund. • Collaboration with **Alternative Energy Promotion Centre** (AEPC) to co-finance MHP. • Cooperation with local banks to provide accessible credit financing to rural communities for MHP (**micro hydro debt fund**) and to promote improved/clean cookstoves. • Possible collaboration for scaling with World Bank project in support of **electric cooking** (project in preparation).
	Implementation • Scaling potential through close cooperation with **local governments and Community Rural Electric Entities** (CREEs) with mandate to promote and manage modern energy solutions.

	• Collaboration with the private sector and government stakeholders for scaling up of **electric cooking**. • Strong partnership between **different implementation organisations** (PA, SNV, GIZ). • Partnership with other **GIZ energy projects** in Nepal (e.g. Renewable Energy for Rural Areas/RERA project).
	Knowledge sharing and learning • Exchange with **CCA, WB and MECS** for the synergy on programme development and implementation opportunities. • Regular **sharing of lessons learned** with national government institutions like AEPC and international organisations as well as with NGOs and the private sector e.g. on grid extension, micro hydro debt fund, electric cooking and local community interventions.
Gender	• Due to COVID-19 lockdown the **gender analysis** had to be postponed. • A **Do No Harm pilot study** was conducted in one CREE and MHP site to assess the unintended impacts caused by the EnDev interventions and to understand the social context relating to conflict sensitivity.

Consideration of ITAC recommendation

Financial contributions from the communities: EnDev Nepal has provided technical assistance and deployed social mobilizer to local communities to increase the repayment rate in micro hydro project sites and plans to apply similar approach to increase the repayment rate for on-grid revolving fund.

Connection of SI: Connecting SI is key for social and economic development of the respective communities and this activity is integrated in all EnDev Nepal support schemes. Additionally, measures for PU of electricity and mechanized power are supported in the respective communities to ensure financial sustainability of the whole support scheme.

Repair and Replacements: EnDev does not support the replacement costs for MHPs but provides technical assistance to rural communities to get rehabilitation support fund from AEPC. AEPC supports damaged MHPs from natural disasters for repair in the form of rehabilitation support and from insurance payment. EnDev has supported CREEs in maintaining the distribution system through repair and maintenance training.

Gender and social inclusion: All EnDev-Nepal implementing organisations are giving priority to ensure a safeguarding culture. Gender focal person were hired, and gender disaggregated data and analysis has been established to classify beneficiaries in terms of gender as well as into different ethnic groups. Health and livelihood improvements expected from using the improved RE technologies are mainly beneficial for women and children and they are the main beneficiaries of the clean cooking. Relevant awareness, behaviour change campaigns and promotional campaigns are conducted under the leadership of different women groups at local level.

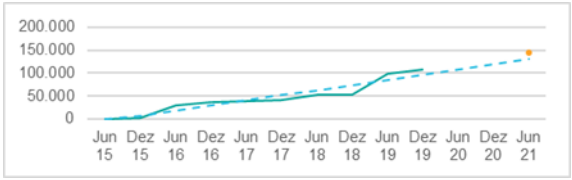
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

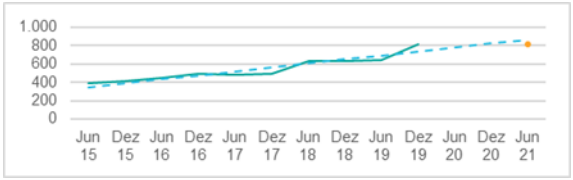
HH Access Cooking

Targets: 145,000 Achieved: 108,309



SI Access

Targets: 820 Achieved: 814

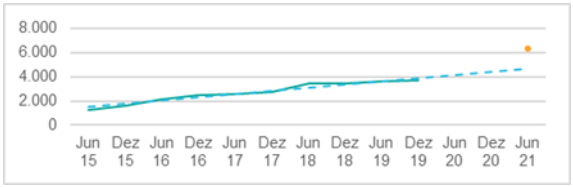


HH Access Electricity

Targets: 360,000 Achieved: 281,196

PU Access

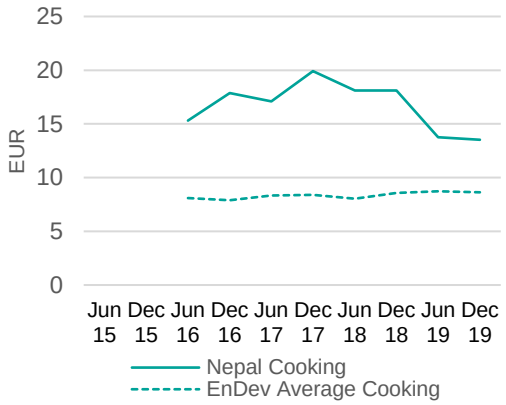
Targets: 6,330 Achieved: 3,725

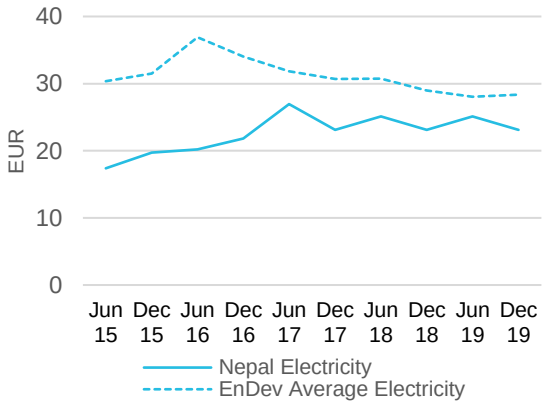


Additional info

- Preparation of RBF approach for higher tier **cooking** stoves and implementation of improved water mills only started at the end of 2019, with implementation from the 2nd half of 2020 onwards.
- Numbers for **SI access** include a considerable support to improved street lighting.
- Out of the total figure from **HH access to electricity** 248,090 HHs benefitted from on-grid component (grid-extension) whereas, 33,106 HHs benefitted from off-grid component (MHP/pico-hydro power/improved water mills).
- Ongoing grid extension projects supported by EnDev are supposed to be completed in 2020 and will contribute substantially in achieving the **PU Access** targets.
- Due to lockdown scenario resulting from **COVID-19 crisis** the targets projected to be met by the end of June 2021 might likely be delayed.

Efficiency





Additional info

- **Cooking Efficiency** is lower than average EnDev cooking as the promoted technologies for clean cooking are mostly tier-2 & -3 stoves which are more expensive.
- **Electricity efficiency** is higher than the EnDev average for Nepal, as on-grid and off-grid support leverages on public and private investment.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

GoN policy targets universal access to electricity in Nepal by 2030. Overall electrity access has been increasing but reliability is still problematic and access in rural areas is often poor and/or limited to lower tier-levels. Off-grid solutions are especially important in remote provinces where the rate of electrification is the lowest in the country (energy access in off-grid areas 10%). For MHP government's subsidies are from 40-50% of total project cost while the rest of cost has to be beared by the rural communities. Due to the remoteness of the sites, overall costs for MHP remain high. EnDev-Nepal's Mico Hydro Development Fund helps through accessible credit financing market development. However, long-term sustainability of supported MHPs depends largely on the possibility to connect to the national grid once the GoN supported grid extension reaches a MHP site. Policy and subsidies are already in place for grid connecting of MHPs, but the implementation is cumbersome and costly. The national electricity utility NEA is still hesitant to connect MHPs to grid due to power quality issues and compatibility with national grid. Complementary to MHPs, EnDev's support to pico-hydro systems and improved water mills in very isolated areas proved to be important as in these places grid connection will be also in the future not be viable due to extraordinary remoteness.

Cooking Sector

Nepal has a long history of ICS promotion which was usually done on push basis (donor or programme oriented), but engagement of the private sector was very limited. With EnDev pioneering the private sectors involvement in ICS promotion up taking of the sector started. With many households still using traditional ways to burn biomass for their daily energy needs there is a considerable potential for a further private sector-led growth of ICS promotion. Markets for higher tier stoves are about to take off with considerable potential. To limit dependence on imported fossil fuel (LPG), GoN intends to increase massively electric cooking. Market development for electric cooking will be a medium- to long-term task. EnDev-Nepal is considered to be a major partner to promote such modern cooking solutions.

Summary EnDev Market Scorecard: Nepal July 2020 Improved cookstoves

Market:

Nepal has long history of ICS promotion which was usually done on push basis (donor or programme oriented), the programme never been on massive scale and engagement of the private sector was almost none before 6-7 years. With the private sectors evolving into the picture of ICS promotion there has been some potential seen for uptaking the sector. The uptake of quality and efficient stoves are a major need as many of the households (especially in rural settings) are using traditional way to burn solid and loose biomass for their daily energy needs which can be a big potential area for the private sector to grow on ICS promotion. This analysis focus on tier 3 and higher ICS.

Indicators per market phase

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	-

Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	↘	Demand decreasing due to COVID-19 crisis and sales are decreasing.
	S1V2	Business modalities	↔	↗	↘	Due to the COVID-19 and the lockdown imposed, this rate is reduced lot. The entities do not have business on hand and had to cut their production cycle which reduces the business for workers.
	S1V3	Formality		↗	→	Exisiting bussiness are not capable of expanding or some even sustaining their business in the current crisis situation .
	S1V4	Jobs created	↗	↑	↘	The lockdown as result of COVID-19 has impacted the ICS business, the importors might need more time to brings the products because of travel or import ban which will significantly delay the ICS promotion.
S2 Sales Volume	S2V1	Products / services sold	→	↑	↓	Almost no sales due to the lockdown imposed by Government. The market was on hold since March which has made a set-back for the sector.
	S2V2	Inventory turnover	→	↑	↘	As there was no sales, the inventory turnover was also not applicable.
S3 Prices, costs and profits	S3V1	Prices	↓	↗	→	As the sales figures are almost zero and the labour force are also not avaiable, the initial cost of the product after lockdown might go up.
	S3V2	Costs	↓	↗	↘	The lockdown might affect on this part.
	S3V3	Profit margin	▽	↗	↘	As the sales figures will start to increase gradually, the profit from the sales will also pick-up slowly. Cost of production is increasing and economy of scale is decreasing.
	S3V4	Investments	▽	↗	↓	Though the Government and relavant stakeholders has put ICS promotion as priority, the incedent of lockdown might create fear to the new start-up and may discourage the new business trying to enter the market. Decrease in demand relating to decreasing in investments.
S4 Supply chain and after-sales service	S4V1	Length	→	↗	→	Supply chain actors have not changed or no new supply chain actors.
	S4V2	Distribution channels	→	↗	→	No new distribution channels
	S4V3	Spatial reach	▽	↗	↓	With no travel allowed due to COVID-19 lockdown, no field activities took place since March 2020, which has negative impact on the ICS activities and promotion. Also the COVID-19 has put every other things on less/no priority, therefore the spatial reach of ICS has gone far back in this period.
	S4V4	Initial suppliers	▯	↗	↘	Same as above, with no active business in hand and more priorities on COVID-19 relief and response activites, the ICS service industry has shrinked in this period.
	S4V5	After-sales service	↗	↗	→	Though there are very few (no) service provider available at local level, the social entrepreneurs do that job. The practice is slowly growing. No changes in after sales services due to COVID-19
S5 Value chain	S5V1	Value added	▽	↗	↘	Value addition to the ICS was low even before the COVID-19. As the market is severly hit from lockdown, value addition would not be relevant and appropriate for the ICS market in this situation. The sales is zero, therefore the suppliers might have to think on reviving the business first. Therefore value addition will set back for some time period on post-corona time.
S6 Business networks	S6V1	Networks	↔	↗	→	No new networks are formed as the challenge would to resume the networks before the COVID-19 crisis.
	S6V2	Partnerships	▽	↗	→	Same as above
S7 Warranties	S7V1	Warranties	↗	↗	→	No change in warranties: The most of the manufactures are providing one year warranty to all tier cookstoves.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	↗	→	No change
	S8V2	Satisfaction level	▽	↗	↘	There is uncertainty due to COVID-19 but there is hope also. Due to high competion only those enterpreneurs having marketing skills might continue their business.
	S8V3	Marketing skills	→	↗	→	The ICS programme and private sector are still be dependent to programme / donor for the demand creation and other supports. (Different marketing approach is required for the new normal situation in COVID-19.)
	S8V4	Advertising	→	↗	↓	New normal scenario might require new advertisments campaigns.
	S8V5	Production automatization	→	↗	→	No changes from prior conditions.
	S8V6	Standardized production	→	↗	→	No changes from prior conditions-
D1 Product diversity	D1V1	Diversity	▽	↗	→	No change in range of stoves available but limited production.
D2 Market penetration	D2V1	Market penetration	▽	↗	↘	The distribution of ICS was almost zero during this lockdown and uncertainity is still there on when will it revive fully. As no products were injected in the market in this period, the demands for replacement and repair remains un-attained, therefore the penetration rate might remains at stagnation or towards the negative side.
D3 Willingness to pay	D3V1	Willingness to pay	↘	↗	↓	Priorities have already been changed of people, local government and local financial institutions.
D4 Systems in use	D4V1	Usage rate	↗	↗	▽	Due to COVID-19 and lockdown, no field visit were possible. No monitoring and follow-up visits were made during this period therefore no data for the usage rate is available and trend is unknown.
	D4V2	Maintenance	▯	↗	↘	The basic repair and maintenance that requires retailors or technician were not done in this period. Due to restriction to travel, the local service centre/providers were not be able to provide maintenance services, therefore it might have decreased.
D5 Replacement and repair	D5V1	Replacement rate	▽	▽	▽	Due to lockdown, there is no replacement in this period.
	D5V2	Repair rate	▯	▽	→	No repair during lockdown
D6 Consumer awareness and perception	D6V1	Awareness	▯	↗	→	As every activities are on hold due to COVID-19 and lockdown, no awareness campains / events are organized.
	D6V2	Perception	↗	↗	→	Because of the COVID-19 and lockdown, many of the people are recovering slowly, therefore ICS migrt not fall under their priority as an immediate need, unless provided as free of cost as humanetarian support from any agency. However it will be tricky to measure the perception trend.
E1 Policy	E1V1	National plans	↔	↑	↑	Government has set the National Plan for the cookstoves promotion.
	E1V2	Policy	↔	↑	↑	AEPC has advocated for the policy for long, now newly formed local units are responsible authorities for ICS promotion, therefore there is a need to support the policy formulation.
	E1V3	Product taxes	→	→	↘	No major changes as of the scenario in Dec 2019.
	E1V4	Business taxes	→	↑	→	Most of the entities are legally registered, therefore pay taxes.
E2 Access to finance	E2V1	Subsidies	↓	↔	↔	Depending on the project, subsidies varies. The government's regular subsidy topped up from the the local authorities and technical assistance is still required for the promotion of technology. No changes under COVID-19
	E2V2	Financing options suppliers	→	→	→	The capacity building and orientation to the local financial institutions (LFI) is now even more relevant. Due to COVID-19 none of these activities happended in this period of time and therefore might need to re-visit. The priority of the LFIs (despite of their interest) might go down. Unless we get these information from the field, it won't be good to conclude anything for now.
	E2V3	Financing options consumers	→	↗	↘	Due to COVID-19 none of these activities happended in this period of time and no products were sold which could attract the financing. Therefore the trend has reduced. Unless we get these information from the field, won't be good to conclude anything for now.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	↗	↗	Biomass Energy Strategy, adoption of ISO IWA standards for tier grading and some basic standards for other aspects are there. These are contineously improving based on the testing results and recommendation from users and stakeholders.
	E3V2	Enforcement	▽	↗	↗	There is still some more opportunity to improve, to make the compliance and enforcement work well.
E4 Market information	E4V1	Cost of information	→	↗	↗	Information on policy and regulation easily available. But detailed market information on e.g. willingness to pay or comsumer behavior are limited and costly.
	E4V2	Market facilitation organizations	▯	↗	→	AEPC, being the focal agency, takes on these responsibilities. Similarly the other layer of governments has also created their focal points to provide these facilities.
	E4V3	Awareness campaigns	↗	↑	↗	Few additional campaigns by few organizations on highlighting vulnerability of infection of COVID-19 to the people who are exposed to very high indoor air pollution.
E5 Expertise development	E5V1	Courses	→	↗	→	No expertise development increase with lockdown scenario.
	E5V2	BDT	→	↗	→	No expertise development increase with lockdown scenario.
	E5V3	User training	▽	↗	→	No expertise development increase with lockdown scenario.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• EnDev as a key partner for responsible national institutions like the Alternative Energy Promotion Centre (AEPC) can contribute to designing **framework conditions for sector transition and piloting electric cooking** in Nepal along with government, private stakeholders and international investors (e.g. World Bank). • Supported **local rural communities** and their newly created micro utilities in rural electrification as major actors for future sector transition and market development to achieve universal electricity access in Nepal while respecting the leave-no-one-behind principle. • Due to its long experience in the MHP sector and already implemented pilots in grid-connecting MHPs, EnDev is a central partner to develop an enabling environment for the **transition from off-grid MHPs to grid-connected MHPs.**
Supply side	• High potential of EnDev's RBF approach to transform the ICS market in Nepal from earlier promoted low tier stoves to **higher tier stoves and PU.** • Introduction of instruments and approaches close to local, rural communities contribute to long-term **sustainability of Micro Hydro power schemes** (e.g. regular follow up and awareness regarding through deployment of social mobilizers; technical support to grid-connection) and contributes to new local investments and PU. • **Digitalization of processes** in EnDev's on-grid/off-grid interventions with potential to further facilitate accountability to project developers and to encourage more private sector investments and government funding. • Support to local companies to get integrated into future **WB financed electric cooking** promotion project.
Demand side	• EnDev as key partner for future **awareness campaigns to promote higher tier ICS and electric cooking** in Nepal along with government and private stakeholders. • Further potential to stimulate demand for **PU in cooking and electricity (hydro) sector.**
Other	• EnDev's engagement in promoting clean cooking and building small scale pico-hydro schemes in vulnerable/marginalized rural remote communities is important for the private sector during and after COVID-19 pandemic. • There is **special need** to support businesses, manufactures and retailers in the form of e.g. awareness raising, marketing/advertising.

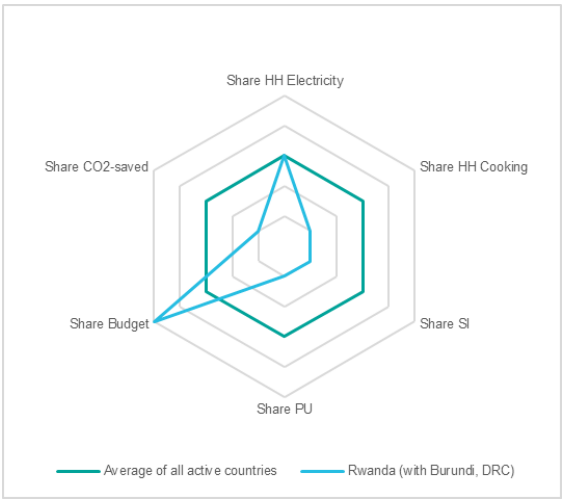
Rwanda (with activities in Burundi and DRC)

Section 1: Key facts

Country facts	
Population	RW: 12.4 million BI: 11.2 million DRC: 86,8 million
HDI	RW: 157 ↑ | Total (0.54) BI: 185 ↑ | Total (0.42) DRC: 179 → | Total (0.46)
UN Classification	RW: LDC / LLDC BI: LDC / LLDC DRC: LDC
Access clean cooking	RW: <5 % BI: <5 % DRC: <5 %
Access electricity	RW: 35 % BI: 11 % DRC: 19 %

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
Implementer	GIZ, SNV, AVSI
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev as a key promoter of **market-driven approaches** through stimulation of demand and supply to disseminate clean energy solutions in the three countries where markets are often dominated by unsustainable subsidy approaches. • Ground laying advisory role in **Rwanda** for **enabling environment**: Rural Electrification Strategy, National Electrification Plan, solar home system import standards, mini-grid guidelines and simplified licensing for mini-grids, standardised PPA and tariffs for independent hydro-power producers, biomass strategy. • EnDev as a main partner to the **Rwandan** government to achieve **ambitious electricity access and NDC objectives** (universal electricity access 48% off-grid / 52% on-grid) by 2024; 68 MW of solar mini-grids to be installed in off-grid rural areas by 2030, dissemination of modern, efficient cook stoves to 80% of rural population by 2030). • Major contributions to achieve **clean energy access and NDC objectives** of **Burundi and DRC**: clean cooking as a priority in the Vision Burundi 2025 and the National Development Plan and access for all men and women to electricity and clean cooking as key objective in the DRC National Agenda. • Clean energy access central especially in **Rwanda and Burundi** to combat severe **deforestation**.
Contribution to paradigm shift	• EnDev pioneers some of the **first private sector-led commercially viable mini-grids in Rwanda** including first-time financing from local commercial banks (22 DC nano-grids, 1 pico-hydro mini-grid and 2 solar mini-grids) laying the ground for achieving ambitious government targets (2.000 mini-grids by 2030). • EnDev accelerates the market transition of the **off-grid solar market in Rwanda** through successful RBF schemes: (i) the Solar Lighting RBF from which benefitted more than 565,000 individuals, and (ii) the Pro Poor RBF reaching some 50,000 vulnerable individuals through innovative RBF scheme focussing in "bottom of the pyramid". • EnDev supports **first-ever on-grid private hydro-power developers in Rwanda** including first-time financing from local commercial banks; 47,827 individuals benefit from the completed projects (four others under construction). • EnDev is transforming **clean cooking markets in Burundi and Rwanda** to enable self-running dissemination of ICS through awareness raising and reinforcing supply chains, already resulting in doubling annual ICS production in Burundi from 8,336 in 2018 to 19,998 in 2019 and 7,740 ICS disseminated in Rwanda; ICS support in DRC is about to kick off.

Important collaborations for scaling up	**Funding and investment** Rwanda: • **Co-financing by USAID**-financed Power Africa Initiative for off-grid solar and mini grids (EUR 1.41 million). • **Co-financing by EU** (Global Climate Change Alliance Initiative/ GCCA+) for clean cooking energy (EUR 5 million, under preparation). • Leveraged USD 30 million from **World Bank** (WB) for scaling up off-grid solar "Pro Poor RBF" as a government programme, rolling out EnDev's RBF pilot in a selected province country-wide and addressing especially access to finance barriers.
	Implementation Rwanda: • Joint implementation of RBF programmes with the national electricity provider (**Rwanda Energy Group**). • Collaboration for pre-commissioning financing of mini-grids (bridge loan) with the WB- supported national **Renewable Energy Fund** (REF) and the **Rwandan Development Bank** (BRD). • Cooperation with **WB and government** to implement the scaling up of the "Pro Poor RBF" (EnDev provides technical assistance and shares EnDev-developed IT tools). • Collaboration with the NGO **Energy for Impact (E4I)** supporting the development of productive use at mini-grid sites. Burundi: • **Grassroot approach for ICS**: working directly with 12 ICS workshops, savings groups, radio stations, financial institutions and community-based associations. DRC: • Collaboration with **UNCDF/UNDP** concerning ICSs market intelligence and with ministries of energy and environment for project implementation and coordination with local authorities.
	Knowledge sharing and learning Rwanda: • Ongoing dialog in the **Energy Sector Working Group** with private sector including associations and key donors (e.g. EU, Power Africa, World Bank, SIDA, FCDO etc) to share lessons learnt, coordinate approaches and encourage public-private cooperation. • Contribution to developing project concepts and sharing knowledge with other donors and the government (e.g. **World Bank and Power Africa** for "Pro Poor RBF" Up-scaling; design of the national Renewable Energy Fund. Burundi: • Support to **ESMAP/World Bank** preparation missions for market studies in both cooking and electricity.

	In all three countries: • Intensive sharing of lessons learnt with **other implementers** (e.g. WFP, WWF and other NGOs, private actors). • Three-country cooking component co-implemented by **SNV, GIZ and AVSI** with an intensive, monthly exchange of technical staff.
Gender	• Rwanda/Burundi: **Gender analysis** is developed and applied in EnDev programming (see also below).

Consideration of ITAC recommendation

Regional focus of ICS activities in DRC: As recommended, the programme is focusing on specific regions, i.e. peri-urban areas on the eastern border of DRC and a specific sub-sector, i.e. stove dissemination. AVSI is utilizing its strong presence in the region to network with strategic partners and coordinate the activities, incl. UNDP (MoU signed), UNCDF, UNHCR etc.

ICS market assessment in DRC: assessment is under way, cf. also "Gender" below. The assessment will also inform the mechanism through which acquisition of machinery and tools should be supported.

ICS RBF scheme for Burundi: An RBF scheme by EnDev itself has not yet been considered, but a collaboration is under preparation with AVSI who are conceptualizing a RBF scheme in their EU-funded ICS programme. With regard to refugees as a target group, many stoves are sold to NGO who support refugees.

Gender: In Rwanda active collaboration (EnDev as one founding member) with USAID-initiated network "Women in Rwanda Energy" (WIRE) including particularly communication and outreach activities; support of young women as stagiaires in energy-focused institutions/programmes planned; outreach towards hydro-power developers on gender-topics including staff meetings on construction sites; introduction of gender sensitive solar off-grid monitoring information system; DRC: currently conducting market assessment to inform interventions for activation of demand for ICS considering gender inclusion.

Productive use in Rwandan mini-grids: Recognizing the need for PU as key to reach economic viability of mini-grids, AVSI has been commissioned to support PU specifically for the EnDev-supported mini-grids.

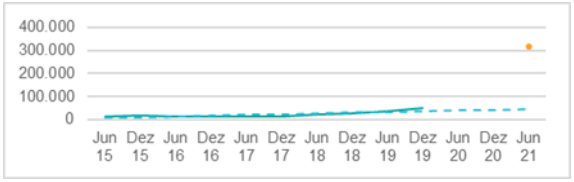
Quality of response to ITAC recommendations (on a scala from low-medium-high): **high**

Section 3: Performance

Effectiveness

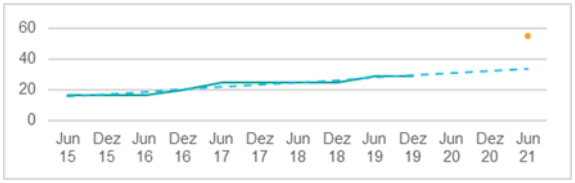
HH Access Cooking

Targets: 315,000 Achieved: 48,368



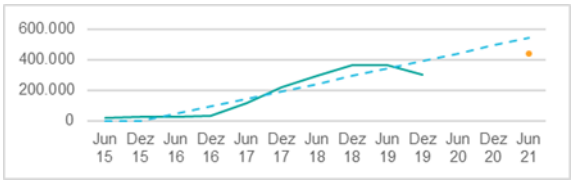
SI Access

Targets: 55 Achieved: 29



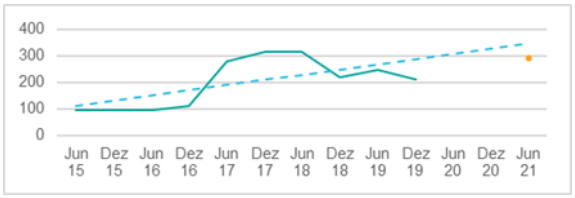
HH Access Electricity

Targets: 438,000 Achieved: 304,874



PU Access

Targets: 290 Achieved: 211



Additional info

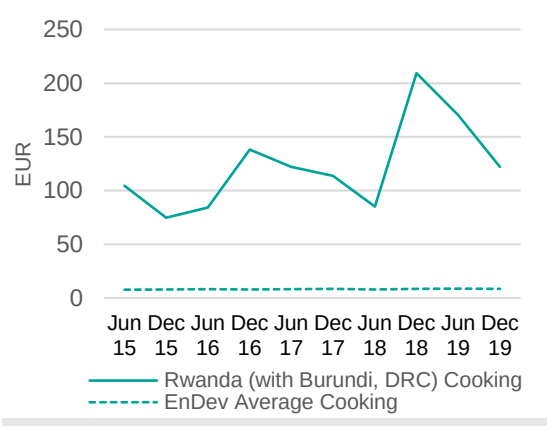
HH Access Electricity Rwanda

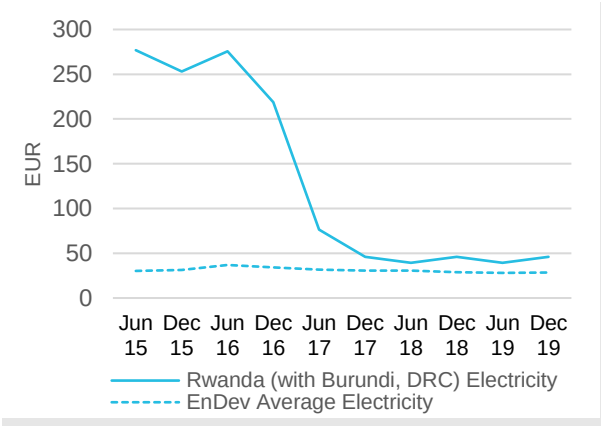
- Slow decline of HH Access Electricity around Dec 2018 and Jun 2019 reflects 1) uncertainty in the SHS market in Rwanda due to ongoing discussion on import standards, which prevent the import of new products; 2) reduced sales in Rwanda due gradual saturation of market segment that can afford SHS; 3) dominant Rwandan solar companies having reached the incentive cap (25% of total incentive budget); 4) stalling of mini-grid market expansion from July 2017 – July 2019 due to the development of the National Electrification Plan to demarcate between on-grid and off-grid areas. In addition: no new commissioning of hydro-power plants 2018-2019 and no new spillovers to increase the number of beneficiaries/households.
- Having now established the National Electrification Plan in Rwanda and other elements for a secure enabling environment to develop off-grid solar electricity access a further increase of the market can be expected (especially in the field of mini-grid development).

HH Access Cooking

- In 2020, almost 10,000 ICS have been disseminated in Burundi, which confirms upward trend reported since Q4 2019. However, since May 2020 production and sales have decreased an average of 15% per month due to political transition and lockdown as a result of COVID-19.
- DRC: EnDev in Eastern Congo started only in February 2020 and is currently finalizing market studies. No ICS access data has been provided to date.
- Rwanda: The ICS component for Rwanda started only in October 2019 and due to the nascent status of the ICS sector in Rwanda results can only gradually be achieved.
- Contracting SNV and AVSI end of 2019 for the cooking components in all three countries exponential growth of ICS results is expected, however, COVID-19 impact might influence this development.

Efficiency





Additional info

- **Electricity efficiency**: The graph refers to Rwanda, since no/small numbers in Burundi and DRC; steep decrease in cost per connection between mid-2016 and mid-2017 is due to significant increase in systems claimed and verified under the solar RBF, which drove down the cost per connection; Burundi: Since 2016, GIZ is not active in the solar energy sector. However, there is a team member in Burundi who is still supervising the solar kiosks (SMSS) and PU. Only 1 out of 131 solar kiosks is not properly working and 4 out 33 PU installations were postponed due to lack of budget. EnDev is planning to launch a second phase of its solar energy component in Burundi.
- **Cooking efficiency**: The efficiency figures merely express the development in Burundi, where the project – after having completed the induction phase with producer training, setting up a commercial chain etc. – handed over key activities to the producers and actors along the dissemination chain. Through intensified marketing activities, the demand and thus also the sales of stoves have been considerably increased all over the year of 2019 (which leads to higher effectiveness in terms of project budget). In Rwanda and DRC the project activities have just started by the end of 2019 resp. beginning of 2020: for these two countries a low effectiveness is to be expected for the year of 2020, before joining the tendency of increase of Burundi.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector (Rwanda)

EnDev spearheaded the first private sector led **mini-grids** in Rwanda through financial assistance with the RBF approach. However, market share remains low compared to SHS. There is a conducive and favourable regulatory, policy and planning enabling environment for mini-grids as of June 2019. During the development of the regulatory framework (from June 2017 to June 2019) no installations were permitted by which the whole sub-sector was on hold. The COVID-19 lockdown impacted the VG RBF pipeline, where several projects had to halt construction due to lockdown measures (difficulties in importing equipment and inability to travel in the country) and the project deadline. Despite important government targets, no development partner will be active in the sub-sector after the phasing out of EnDev's RBF. The mini-grid sector requires further support.

PicoPV sales are starting to pick up thanks to the "Pro Poor" RBF after a long period of stagnation. While the regulatory environment has developed favourably, challenges for long-term sustainability remain, incl. but not limited to profitability, long-term maintenance, access to local currency finance, etc. According to a survey conducted by the local industry association in April/May 2020, many companies expect COVID-19 to have a significant impact on their business, which would also delay the implementation of the "Pro Poor" RBF. The scope of these impacts remains to be determined.

Private investment in **hydro-power** is considerable: apart from the projects which are owned and managed by private investors that EnDev supported, the same developers were able to develop further projects thanks to the experience gained with EnDev (spill-over projects). While the government is generally encouraging EnDev to continue to contribute to the development of the sub-sector (for large projects), the Development Bank of Rwanda (BRD) is formally requesting EnDev to partner with them in order to finance small projects which are in different stages of implementation and have got the required agreements with the government. COVID-19 has negatively impacted the implementation of hydro power projects, especially the construction of civil works where numerous teams of masons, technicians etc. have to work together, which was not possible for some months during the lockdown.

Grid densification: The national electricity utility greatly appreciated the 14,800 households connected to the national power grid and now expresses the need for more connections as the access rate is still around 52% in Rwanda, and less in rural areas.

Cooking Sector

Currently, ICS production in Rwanda focuses mostly on low-tier models and there is a lack of capacity in monitoring, market surveillance and quality control. Also, there is no commercial financing scheme for ICS, and most donor-funded NGOs focus on free distribution without a long-term vision. SNV is supporting stove production cooperatives on technical, business and brand awareness while establishing a distribution network. With the upcoming EU-Co-funding (GCCA+) EnDev will scale up these activities in terms of scope and project duration, while also covering aspects not yet dealt with (e.g. alternative cooking fuels, productive use, social institutions).

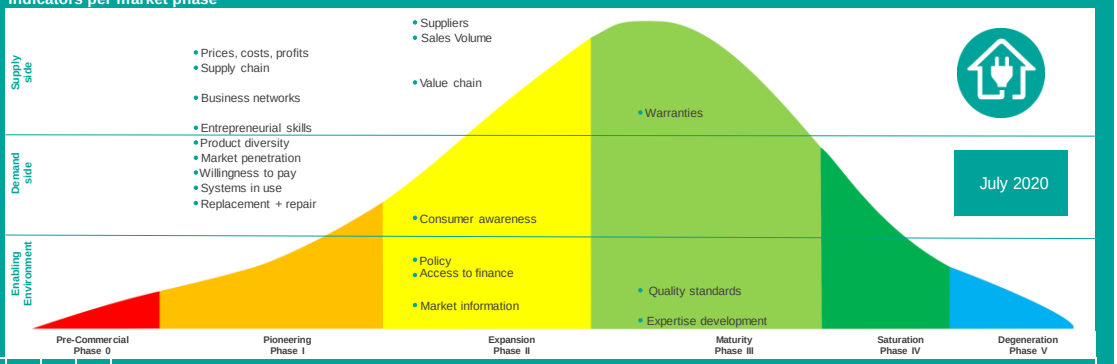
The ICS market in Burundi is in its nascent stage and most stakeholders still apply a humanitarian approach, which encourages local producers to depend on subsidies instead of developing sustainable commercial approaches. Due to the COVID-19 crisis and political changes in Burundi, outputs for ICS production and dissemination fell short for Q2 2020.

To date, the ICSs value chain is underdeveloped in Eastern DRC where EnDev is operating; however, end-users have a considerable willingness to pay but there is a lack of product diversity and awareness on the advantages of ICS. Results of the ongoing market assessment will be analysed by September 2020 and will inform EnDev's future intervention strategy.

Summary EnDev Market Scorecard: Rwanda July 2020 Solar Home Systems

Market: National market for solar home systems in all of Rwanda

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	▽	After the announcement of the Pro Poor subsidy programm some companies originally not active in the SHS market (but working in the renewables sector) are starting to offer SHS to benefit from the subsidy. (Source: Pro Poor RBF applications)
	S1V2	Business modalities	↗	→	↗	Some companies appear to be adapting to the impacts of the 6-week COVID-19 lock down and current restrictions, e.g. by adapting their distribution models, implementing hygiene concepts and appearing to be more flexible in regard to missed payments.
	S1V3	Formality	↑	→	→	No change
	S1V4	Jobs created	↗	→	↘	31% of companies who participated in the EPD COVID-19 survey had to lay off staff and /or postpone hiring decisions. (Source: EPD COVID-19 survey)
S2 Sales Volume	S2V1	Products / services sold	↗	↗	↗	Sales have started to pick up since the announcement of the Pro Poor RBF and are continue to increase once the government's national subsidy programme is launched. Further clarification on the import standards has also enabled companies to order new products. (Source: Pro Poor data, company interviews and government publication)
	S2V2	Inventory turnover	↔	→	↗	Due to the 6-week lockdown and movement restrictions thereafter, inventory turnover decreased. However, it appears to be picking up again for companies that have systems in the country. Some companies are facing difficulties importing new systems and have run out of stock. (Source: Company interviews)
S3 Prices, costs and profits	S3V1	Prices	↔	→	→	No change observed
	S3V2	Costs	↗	↘	↘	As companies try to maintain their staff, the costs per unit have likely increased due to the COVID-19 lockdown.
	S3V3	Profit margin	↗	→	↘	A survey conducted by EPD (the local industry association) shows that revenues and profit margins have decreased or are expected to decrease due to COVID-19. 55% of businesses survey expected a revenue reduction of more than 50%. Presumably this in addition of the cost of maintaining staff, call centers, etc. is also reflected in lower profit margins. (Source: EPD COVID-19 Survey)
	S3V4	Investments	↔	→	→	No further information.
S4 Supply chain and after-sales service	S4V1	Length	↗	↗	↗	No change observed
	S4V2	Distribution channels	↗	▽	▽	68% of companies indicating having experienced supply chain and distribution issues according to the EPD survey. Whether these issue will continue to impact business is unclear until the lock down has been lifted. (Source: EPD COVID-19 survey)
	S4V3	Spatial reach	↗	↗	→	No further expansion observed. However, due to COVID-19 impacts it is possible that some companies may consolidate their business.
	S4V4	Initial suppliers		→	→	No change observed
	S4V5	After-sales service	↗	→	→	Companies were unable to service customers during lockdown and when movement restrictions were in place. As free movement is currently possible, there do not seem to be any changes to after sales services for the moment. Challenges may arise if (smaller) companies go bankrupt and can no longer serve previous customers.
S5 Value chain	S5V1	Value added		→	→	No change observed
S6 Business networks	S6V1	Networks	↗	→	→	No change observed
	S6V2	Partnerships	↗	▯	▯	N/A
S7 Warranties	S7V1	Warranties	↗	→	→	No change observed, see comment on after sales service above.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	→	→	No change observed
	S8V2	Satisfaction level	↔	▯	▯	N/A
	S8V3	Marketing skills	↗	→	→	No change observed
	S8V4	Advertising	→	→	→	No change observed
	S8V5	Production automatization	→	▪	▪	N/A
	S8V6	Standardized production	▯	▪	▪	N/A
D1 Product diversity	D1V1	Diversity	↔	→	↗	Since Pro Poor RBF subsidy, the plan to establish a larger, national subsidy programme was announced, and the situation regarding import standards has become somewhat clearer, companies have identified and will start to offer a slightly wider variety of products. (Source: Pro Poor RBF applications & discussions with companies)
D2 Market penetration	D2V1	Market penetration	↗	↗	↑	Since the Pro Poor RBF has been launched, sales have increased slightly with previously unreached segments now accessing products. (Source: Pro Poor RBF data)
D3 Willingness to pay	D3V1	Willingness to pay	↔	→	→	No change observed
D4 Systems in use	D4V1	Usage rate	↗	▯	▯	N/A
	D4V2	Maintenance	↗	↗	↗	No change observed
D5 Replacement and repair	D5V1	Replacement rate		▯	▯	N/A
	D5V2	Repair rate	↗	→	→	No change observed. Presumably, customers with SHS that are broken and no longer covered by the warranty will be less likely to get them repaired due to financial constraints resulting from COVID-19.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	↗	As part of the Pro Poor RBF, EnDev and the national utility (EDCL) have been raising awareness among local government and citizens about the programme and hence SHS. Channels include in person meetings, posters, radio advertisement (to be aired). It is assumed that this would have positively impacted consumer awareness.
	D6V2	Perception	↗	▽	▽	No change observed
E1 Policy	E1V1	National plans	↔	↗	↗	As sales have started to increase again following the lock down and with the support of the Pro Poor RBF, the government is moving closer to reaching the target. With the arrival of the government RBF expected end of the year, sales and the probability of reaching national targets are expected to increase. (Source: Pro Poor RBF data)
	E1V2	Policy	↔	→	→	Some progress has been made on the import standards, with a tool for checking compliance being officially published. However, issues have been encountered with the National Electrification Plan, which sets out which villages are supposed to be connected to grid or mini-grids, or serviced by SHS, resulting in uncertainty for companies. (Source: EDCL)
	E1V3	Product taxes	→	→	▽	EAC recently published an amendment to the import tax exemption making it more restrictive than before: exceptions for "specialised equipment for generation of solar and wind energy incl PV modules, direct current charge controllers, direct current inverters and solar deep cycle batteries which use and - or store solar power". Local revenue authority claimed upon inquiry that the new rules will not apply to Rwanda. Whether this will be true remains to be seen. (Source: EAC publication and information from companies)
	E1V4	Business taxes	↗	→	→	No change observed
E2 Access to finance	E2V1	Subsidies	↗	→	↓	The trend can be considered as negative as Rwanda is moving towards a nationwide subsidy scheme for low income households under the Renwable Energy Fund due to the limited ability to pay of rural households. (Source: World Bank)
	E2V2	Financing options suppliers	→	→	↘	According to EPD, companies have a high need for bridging loans, working captial and other forms of finance to overcome the financial difficulties encountered due to the impacts of COVID-19. However, to date no alternatives have emerged. (Source: EPD COVID-19 survey)
	E2V3	Financing options consumers	↗	→	→	No change observed
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	→	→	No change observed
	E3V2	Enforcement	→	↗	▽	No change observed
E4 Market information	E4V1	Cost of information	▯	→	→	No change observed
	E4V2	Market facilitation organizations	↗	→	→	No change observed
	E4V3	Awareness campaigns		→	↘	EDCL had to pause its awareness raising activities due to the prohibition of public meetings. (Source: EDCL)
E5 Expertise development	E5V1	Courses	▯	▽	▽	Most courses have been halted or are conducted online where possible.
	E5V2	BDT	▯	▯	▯	N/A
	E5V3	User training	↘	↔	↔	No change observed

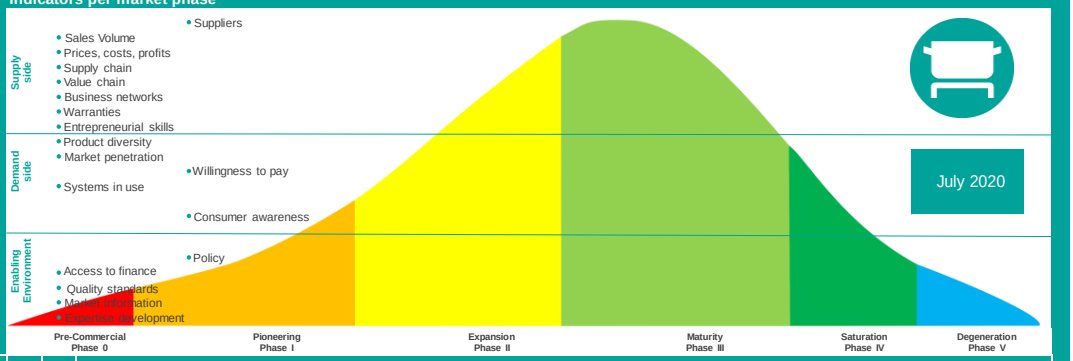
Summary EnDev Market Scorecard: Rwanda July 2020 Improved cookstoves

Market: The market described in this scorecard is related to household ICS (all tiers) in urban and peri-urban areas in all the 30 districts of Rwanda (the EnDev intervention zone for this component).

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators	Variables	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1 Businesses	→	↑	Last year, few stoves companies were involved in this business but now the interest is high and new companies are joining and inversting.
	S1V2 Business modalities	→	↑	Producers increasingly dedicating full time to their business, with an emphasize on production but also distribution networks development.
	S1V3 Formality	↗	↑	Most of the ICS producers (95%) are formally registered either cooperatives or privates company.
	S1V4 Jobs created	→	↑	Jobs creation on the rise within canarumwe cooperatives and local companies.
S2 Sales Volume	S2V1 Products / services sold	→	↑	The ENDEV III clean cooking Project has contributed to an increase in quality production, while efforts are now put to develop the retail and distribution system.
	S2V2 Inventory turnover	→	↑	
S3 Prices, costs and profits	S3V1 Prices	→	↑	Currently, ICS' prices are adapted to the different customers clusters' raging from 2,500 Rwf to the higher stoves costing more than 50,000 Rwf.
	S3V2 Costs	→	↗	Higher tier stoves are still not affordable to the wider population. Subsidies may contribute to increased access, especially for the poorest (Ubudehe cathegory 1).
	S3V3 Profit margin	→	↗	Profit margins steadily increasing with sales volumes. The ENDEV III Cleancooking project contributed to market further market development and related economy of scale needed to increase profitability.
	S3V4 Investments	→	↑	Interest for the ICS sector is high and the number of new companies investing in the sector increasing, also WB and EU GGCA+ projects to introduce RBF schemes
S4 Supply chain and after-sales service	S4V1 Length	▽	↑	Cooperatives and companies still occupy all the distribution network sections.
	S4V2 Distribution channels	→	↑	Lack of retailers and difficulties for producers to reach the last mile
	S4V3 Spatial reach	→	↑	Cooperatives and companies have recently started to sell beyond direct vicinity.
	S4V4 Initial suppliers	→	↑	Limited production of equipment and components and under-developed markets in biomass energy equipment and services, because of high initial investment cost
	S4V5 After-sales service	→	↑	
S5 Value chain	S5V1 Value added	▯	→	
S6 Business networks	S6V1 Networks	→	↑	Retailing system development and establishement started to materialize with the ENDEV III Project support.
	S6V2 Partnerships	▽	↑	Business have started to engage local authorities towards an increased market share. In addition, there are signs that 'indepedants' are joining the retailing system.
S7 Warranties	S7V1 Warranties	▽	↑	
S8 Entrepreneurial skills	S8V1 Financial literacy	↗	↑	Some of the private sector actors have benefited from SNV's previous business trainings and coaching.
	S8V2 Satisfaction level	→	↑	Companies are increasingly developing their own market niches.
	S8V3 Marketing skills	→	↑	Increasingly businesses are developing their own markting tools, while engaging the population, especialy through local leaders and community events.
	S8V4 Advertising	→	↑	
	S8V5 Production automatization	→	↑	Companies are increasingly investing into efficient production machinery, which is not yet the case for producer cooperatives.
	S8V6 Standardized production	↑	↑	The ENDEV III clean cooking Project supported some producers to have standardized production processes.
D1 Product diversity	D1V1 Diversity	↑	↑	More private sector actors coming on board with a variety of quality products (IGNITE, SAFER Rwanda, GGS)
D2 Market penetration	D2V1 Market penetration	→	↑	84% of the population still use innefficient technologies for cooking.
D3 Willingness to pay	D3V1 Willingness to pay	→	↑	Switching from a mostly no-cost energy source (firewood) to a cost-related energy source requires that the household has a sufficient disposable income to procure the required fuel.
D4 Systems in use	D4V1 Usage rate	▽	▽	
	D4V2 Maintenance	▽	▽	
D5 Replacement and repair	D5V1 Replacement rate	▽	▽	
	D5V2 Repair rate	▽	▽	Efforts made by the ENDEV III Clean cooking project to avail local technicians at grass-root level , who can promote ICS , but also repair on demand.
D6 Consumer awareness and perception	D6V1 Awareness	→	↑	The involvement of local leaders into mobilisation activities and inclusion ICS targets into their performance targets, has contributed a lot to awareness creation. However, COVID-19 negatively affected community awareness and marketing activities and private sector mobility.
	D6V2 Perception	→	↑	Satisfied customers are contributing to higher adoption within their neighbourhood.
E1 Policy	E1V1 National plans	↗	↑	National biomass strategy almost finalysed
	E1V2 Policy	↗	↑	Inadequate coordination of efforts among stakeholder institutions in the biomass sub-sector
	E1V3 Product taxes	→	↑	Not all ICS components are exempted from taxes
	E1V4 Business taxes	→	▽	
E2 Access to finance	E2V1 Subsidies	→	→	Development of a GCCA+ project to be implemented by GIZ.
	E2V2 Financing options suppliers	→	▯	Development of a Result-based financing (RBF) project with the support from the World Bank and the EU
	E2V3 Financing options consumers	→	▽	Inadequate financing and monitoring mechanisms, resulting in low uptake of efficient technologies and insufficient scaling-up of production capacity and development of biomass markets
E3 Quality regulations, norms and standards	E3V1 Regulation, norms + standards	→	↑	lack of a compulsory testing, quality control and recognition procedure
	E3V2 Enforcement	→	▽	Lack of guidelines to allow for high efficient stoves to be disseminated
E4 Market information	E4V1 Cost of information	→	↑	The ENDEV III Project contributed to increased and tracked sales
	E4V2 Market facilitation organizations	↗	↑	Market facilitation conducted by the ENDEV III project in partnership with EDCL
	E4V3 Awareness campaigns	↗	→	EDCL has conducted a number of awareness campaigns.
E5 Expertise development	E5V1 Courses	→	↑	
	E5V2 BDT	→	↑	
	E5V3 User training	▽	↑	

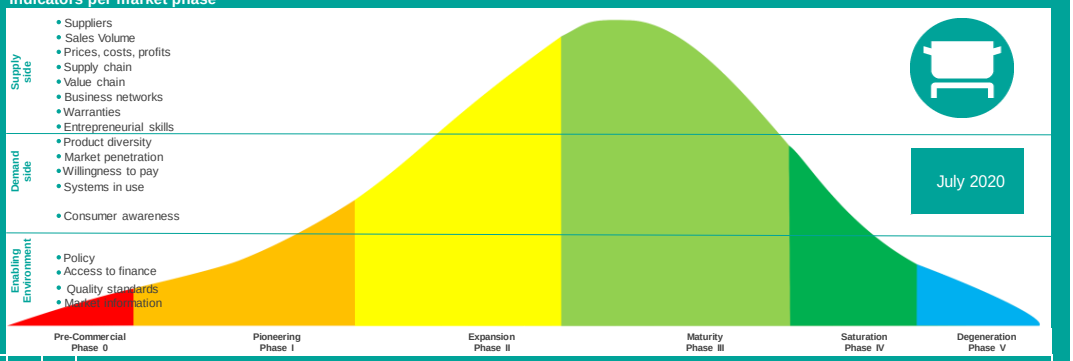
Summary EnDev Market Scorecard: Burundi July 2020 Improved cookstoves

Market: ICS market in Burundi is in its nascent stage with penetration as low as 2% of total population. ICS are still considered as humanitarian affair by most stakeholders. ICS in the market are locally produced by artisans. It is not clear whether COVID-19 or the political crisis in country (including sanctions) have caused slowdown in the ICS sector since Q2 2020.

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators	Variables		Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↘	↘	Beyond COVID-19, political crisis in the country along with sanctions and low access to foreign currency has prevented businesses from scaling up. More information available on ESMAP report on the cooking and solar energy sector.
	S1V2	Business modalities	▽	▽	Access to financing is limited to businesses for them to: 1) offer consumers the option of paying ICS in installment payments, 2) come up with innovative business models and diversify/scale up. Also, access to foreign currency in Burundi is difficult.
	S1V3	Formality	↓	↓	ICS workshops remain informal and struggle with quality control of produced ICS.
	S1V4	Jobs created	↗	↘	Over the past three months, EnDev Burundi has recorded a decrease in sales due to COVID-19 (since mid-June) and due to political transition (since May). Also, summer is considered low season for stove and sales production. Monthly internal reporting.
S2 Sales Volume	S2V1	Products / services sold	↗	↘	Since May this year, sales have decreased 15% according to internal reporting from field members in Burundi.
	S2V2	Inventory turnover	↗	→	Since May this year, production has decreased 15% according to internal reporting from field members in Burundi. We assumed that due to low season in the sector, stock may decrease until September.
S3 Prices, costs and profits	S3V1	Prices	↓	↓	Most disseminated stoves are being highly subsidized by international organisations (i.e. UNICEF, UNDP, and WFP) and NGOs.
	S3V2	Costs	→	→	Producers only consider variable costs when determining final price for end-users. Costs vary little because most inputs are locally available but any time an input comes from abroad input costs spike.
	S3V3	Profit margin	▽	▽	20% is the average profit margin per sold ICS (without considering fixed costs).
	S3V4	Investments	↘	↘	lack of finance and investment options available for the suppliers
S4 Supply chain and after-sales service	S4V1	Length	▽	▽	no information available
	S4V2	Distribution channels	↓	↓	Beyond the kayanza-bujumbura-gitega triangle, distribution network is almost inexistent. However, there are local workshops spread out across the country.
	S4V3	Spatial reach	↘	↘	Beyond the kayanza-bujumbura-gitega triangle, producers struggle to reach out end-users. More info on ESMAP study.
	S4V4	Initial suppliers	▯	▯	There are some impressive suppliers, considering nascent stage of market in Burundi.
	S4V5	After-sales service	↓	↓	Since most sales are made by NGOs who later distribute ICS for free, there is not real understanding of after sales services.
S5 Value chain	S5V1	Value added	↓	↓	Value chain varies across players (producers/distributors) across the board. Most of them do not follow a market approach that adds value to customer.
S6 Business networks	S6V1	Networks	▽	▽	Networks across country or regionally are limited. However, workshops are decentralised and close to end-users, which makes transports costs low.
	S6V2	Partnerships	↓	↓	Most partnerships are between producers and NGOs/Humanitarian Orgs for free distribution of ICS.
S7 Warranties	S7V1	Warranties	▯	▯	Producers are unaware of warranty schemes for ICS or do not understand need for warranties.
S8 Entrepreneurial skills	S8V1	Financial literacy	↓	↓	Basic or inexistent financial literacy among end-users and local owners of workshops. Most end-users rely free give aways and most producers on subsidies/grants.
	S8V2	Satisfaction level	↓	↓	Since most disseminated ICS are free hand outs by NGOs and International Organisations, satisfaction ratings are not being measured.
	S8V3	Marketing skills	↓	↓	Producers lack marketing skills when selling ICS. It is mainly dominated by NGOs and Humanitarian organisations.
	S8V4	Advertising	↓	↓	Even the most professional producers and retailers depend on subsidies and do not deem necessary advertising efforts/expenditures.
	S8V5	Production automatization	↓	↓	There is no workshop with a kiln or with a automatized production system in place. Everything is done manually.
	S8V6	Standardized production	↓	↓	There is no branding system or quality control in place.
D1 Product diversity	D1V1	Diversity	↓	↓	All ICS are locally produced with locally procured inputs. Only ICS model widely available in market is MATAWI (clay and metal versions). There are imported stoves but Burundians cannot afford them. Internal EnDev reports and ESMAP study.
D2 Market penetration	D2V1	Market penetration	↓	↓	Only 2% of Burundians hace access to certified ICS; 90% of rural end-users continue using three stones and 99% of end-users continue to depend on solid fuels (wood) due to poverty increase and affordability (since 2010) ESMAP study.
D3 Willingness to pay	D3V1	Willingness to pay	↓	↓	Affordability remains the main challenge for end-users. The average Burundian household only spends 67 USD in consumables per month. And every expense that represents over 5% of monthly expenses is no longer considered affordable. WTP is high in capital but weak in rural areas.
D4 Systems in use	D4V1	Usage rate	↗	↗	Matawi gives users the option to use either wood or charcoal so adoption. However, Matawi owners continue to use three stones.
	D4V2	Maintenance	▽	▽	Matawi, when well mantained, can last up to 2 years
D5 Replacement and repair	D5V1	Replacement rate	▽	▽	do not know
	D5V2	Repair rate	▽	▽	do not know
D6 Consumer awareness and perception	D6V1	Awareness	↔	↔	In urban areas, where phone and radio penetration is high, Burundians tend to be more aware of ICS.
	D6V2	Perception	↔	↔	Higher in urban areas than in rural areas based on internet, radio and telecommunications penetration.
E1 Policy	E1V1	National plans	▽	▽	While the Vision Burundi 2025, National Development Plan 2018-2027, Energy Policy from 2011 underline importance of ICS and cooking fuels, application of these policies is limited. More info on ESMAP study.
	E1V2	Policy	▽	▽	While the Vision Burundi 2025, National Development Plan 2018-2027, Energy Policy from 2011 underline importance of ICS and cooking fuels, application of these policies is limited. More info on ESMAP study.
	E1V3	Product taxes	▽	▽	Even though tax breaks for cooking fuels and ICS is established, customs do not apply them consistently. Import taxes amount to 20%. More info on ESMAP study.
	E1V4	Business taxes	▽	▽	VAT for consummers stands at 18%.
E2 Access to finance	E2V1	Subsidies	▯	▯	does not apply for ICS but SHS technologies
	E2V2	Financing options suppliers	↓	↓	Limited access to international finance (trade sanctions imposed against Burundi), lack of access to foreign currency, the existence of two exchange rates (official and black market), and high volatility of exchange rate (black market) prevent the private sector from importing ICS, ICS parts and cooking fuels or promoting innovative business models. Banks, MFIs and credit associations's consumption loans are scarce.
	E2V3	Financing options consumers	↓	↓	Only 5% of customers have been able to acquire credits for consumable goods, including energy services. More info on World Bank's Financial Inclusion report or ESMAP study.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↘	↘	Policies are drafted but no specific regulations in regards to ICS have been promoted by Ministry.
	E3V2	Enforcement	↗	↗	Policies are drafted but no specific standards in regards to ICS have been promoted by Ministry.
E4 Market information	E4V1	Cost of information	▽	▽	do not know
	E4V2	Market facilitation organizations	↓	↓	EnDev is the only market faciliation organisation well established in Burundi. More info on ESMAP study.
	E4V3	Awareness campaigns	↓	↓	EnDev works regularly with journalists, radio stations and communities to raise awareness about ICS as a consumable good.
E5 Expertise development	E5V1	Courses	▽	▽	do not know
	E5V2	BDT	▽	▽	do not know
	E5V3	User training	▽	▽	do not know

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Continued engagement with governments and other stakeholders to 1) further strengthen **policy and regulatory environment** for off-grid solar technologies and hydro-power systems (in Rwanda) as well as for ICS market development and 2) for improved **sector monitoring** (in all three countries). • Organizational capacity building of national and local renewable energy stakeholder platforms for increased **ICS sector coordination**, knowledge exchange, advocacy, policy formulation and decision making (in all three countries). • Establishing formal engagement with the new energy ministry in Burundi and support to develop **ICS norms and standards**. • Promotion of **market-based approach for ICS** among existing and new stakeholders. • Support to **advocacy role of sector associations** (e.g. Private Energy Developers in Rwanda) including support to publishing sector reviews.
Supply side	• Facilitate **market extension of picoPV** into difficult segments through financial support (support of Up-scaling of “Pro Poor” RBF in Rwanda). • Explore and facilitate the development of a **market for solar pumps** and / or **solar powered equipment for agro-industry.** • Explore and facilitate access to stand-alone **solar systems for social institutions** (e.g. health centers, schools, etc.). • Continue to spearhead **mini-grid development** in Rwanda, with structural adjustments to its design, to increase off-grid connections to electricity, improving viability through PU support and through support the development of nationwide financial support to mini-grids. • Leverage partnerships in Rwanda through the WB supported Scaling up Renewable Energy Program (SREP) and enable and AfDB to **upscale off-grid technologies** through the Renewable Energy Fund. • Promotion of a competitive and sustainable private-led production and dissemination of **efficient cooking devices and alternative fuels** with a low carbon-footprint through the upcoming GCCA+ project in Rwanda. • Support stove producers to produce cost-effective and quality local ICSs through **exchange of best practises between all three countries**, improved access to ICS market intelligence and sales channels, development of technical, business and brand awareness and marketing skills. • Linking ICS producers with retailers (including last mile shops) and streamline purchase orders in order to establish a **decentralised distribution networks** with reduced transportation paid by end-consumers.

Demand side	• Engage with **agro-industry users** in Rwanda through awareness raising, trainings, support, etc. to facilitate use of solar pumps and / or solar powered equipment. • Support to the development of **PU at mini-grid sites** in Rwanda through 1) coaching and training 2) improved enabling environment with linkages to the financial sector 3) financial support through matching grants. • Promotion of **affordable ICS options** adapted to the population's needs and capacities and behavior change promotion. • **Raising awareness** on the advantages of ICS through radio advertisements, awareness campaigns, community-based initiatives. • Support to financial institutions and associations to enable access to **consumption loans for energy services** (e.g. ICS and solar lanterns). • Encourage establishment of **saving groups** or others credit structures to increase affordability of ICS and off-grid solar.
Other	• Facilitate development of a **market for long-term maintenance of off-grid solar installations and picoPV** through financial and technical support / capacity building to government, companies and technicians. • Engaging with government and stakeholders to pilot in Rwanda **long-term maintenance and end-of-life management** as new focal areas for the sector. • **Facilitating partnerships** between local recyclers and off-grid companies to encourage proper end-of-life management. • Encouraging better end-of-life management through **technical** (e.g. for establishing internal policies, awareness raising campaigns) **and financial assistance** (e.g. for take back schemes) to Rwandan companies.

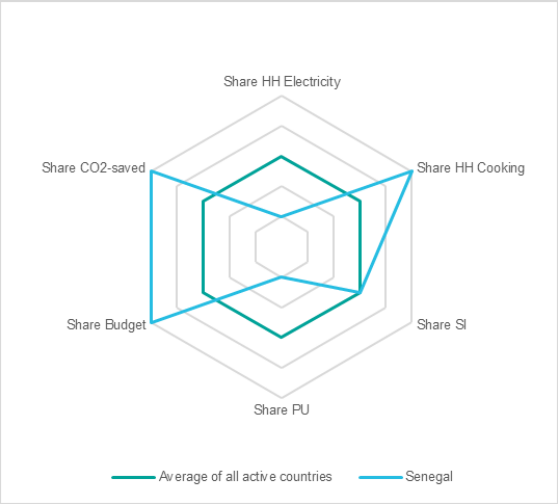
Senegal

Section 1: Key facts

Country facts	
Population	15. 9 million
HDI	166 ↑ | Total (0.52)
UN Classification	LDC
Access clean cooking	41 % urban < 5 % rural
Access electricity	92 % urban 44 % rural

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
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• The government is **prioritizing Rural Electrification** by setting a target of achieving universal access to electricity by 2025; next to the expansion of the national grid government policies outline EnDev supported solar mini-grids as an important element and interim solution for years to come. • Supporting the development of 80 solar mini-grids EnDev is uniquely positioned to contribute experiences and innovative solutions for **sustainable management of mini-grids**. • EnDev's new focus on **productive use of energy (PU)** applying fuel efficient, climate friendly technologies will crosslink to various important SDGs, especially in terms of women's empowerment and economic inclusion. • EnDev's **key role in achieving the government's ICS targets** (8.4 million ICS to be sold cumulatively between 2010-30) is about to be substantially strengthened by a new EnDev-GCF project (see below).
Contribution to paradigm shift	• **Market development of ICS** will be substantially taking up space by the new EnDev-GCF project (see below) creating an ODA-free, commercially viable growth path. • By supporting the introduction of harmonized tariffs for electricity in rural electrification throughout the country (including for solar-mini grids) and by integrating grid-readiness of mini-grids EnDev contributes to **sustainable growth of the rural electrification sector** and respective private sector involvement. • **PU technologies** are still in a pre-commercial/pilot phase but have the potential to contribute in the medium-run substantially to market development of climate friendly technologies. • **First PU ideas with high transformational potential** have been identified, e.g. (i) clean energy solutions for the women-dominated fish smoking sector, (ii) solar energy solutions for milk cooling (request from the government to support scaling of pilots to reduce milk imports and increase local value-added), (iii) energizing agro-processing. • Baseline studies will further concretize PU support areas with **high transformational potential** to be developed as of 2021.
Important collaborations for scaling up	**Funding and investment** • EnDev has achieved access to **GCF funding** to scale up the approach for ICS promotion in Senegal (and in Kenya); through a business development strategy which will professionalize the supply chain by promoting performance based professionalization kits; this approach will lift ICS market development on the next level thus supporting exponential growth.

	Implementation • **National outreach of EnDev-GCF activities** is ensured through national NGOs (Enda Energie, Enda Ecopop and CONCEPT) who will work as executive entities in the implementation of the EnDev/GCF project. They will use their large network with other local NGOs for reaching 8,000 villages (> 50% of all villages). • From 2020 onwards, EnDev Senegal is forming a **sub-cluster** with the country projects of EnDev-GCF and the **Green Peoples Energy (GBE) project** in Senegal (BMZ financing) to ensure maximum synergy and collaboration. • The transformational work of EnDev with ministries and donors on rural electrification is closely aligned with complementary activities of the BMZ-financed and GIZ-implemented "***Program Energies Durables***"/**PED** (Sustainable Energy Program).
	Knowledge sharing and learning • EnDev is **collaborating with other implementers** (e.g. rural electrification agency, operators of mini grids, other implementing programmes such as Plan International etc.) and bilateral GIZ programmes such as "*Réussir au Sénégal*", PED and the University Programme on Renewable Energies and Energy Efficiency (PESEREE). • The focus is on **sharing experiences and lessons learnt** with partners on e.g. the application of the tariff harmonization in off-grid technologies, the sustainability of mini-grids, productive use of electricity, electric waste etc.
Gender	EnDev reflected profoundly on the role of gender in the implementation of its interventions (including a **gender study and a gender action plan** for the GCF project). In this process, EnDev also linked up with national NGOs specialized on gender. This will also benefit EnDev in the re-planning of its activities. Future activities will put a **special focus on women (groups)** as important actors in relevant value chains, e.g. marketing of ICS, efficient fish processing, PV-power-irrigated production of fodder for dairy cows, distribution of PV systems.

Consideration of ITAC recommendation

Re-planning of EnDev Senegal: The recommended re-planning of EnDev was put on hold until the exact outline of the new projects GBE and EnDev/GCF was known (first semester of 2020), and will now resume.

Sustainability of mini-grids: Once the solutions for improving the sustainability of mini-grids show the expected results, we will promote actively the findings through all relevant stakeholders. However, the COVID-19 restrictions have further increased the challenges for the operators of mini-grids (= delay). EnDev is seeking for certain mini-grids (where individual households are too dispersed to allow for distribution lines) to broaden its approach beyond the private operator model and to complement it with PAYGO models. No financial support to new installations of mini-grids is foreseen, however, EnDev will play an advisory role on good practices.

PU in rural electrification: PU is a focus of the GBE project that will test several approaches. In parallel, EnDev will focus on complementary PU solutions for its current implementation zones. Approaches will be aligned with the GBE planning. An 'RBF' scheme for PU with high potential will be considered once the liquidity of COVID-battered companies is permitting such an approach.

Electrification of health posts: The market-focused strategy on electrification of health posts is under revision, as the landscape of donors and approaches is changing due to COVID-19 (more focus on aid). Both EnDev and GBE have to align the approach to the changes in the sector environment.

Electric waste: EnDev Senegal is exchanging experiences on electric waste management with other countries in the frame of the GIZ network on electric waste and is assessing collaboration opportunities with other actors in Senegal.

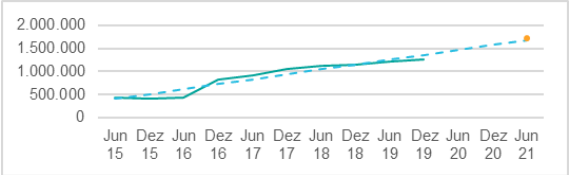
Quality of response to ITAC recommendations (on a scala from low-medium-high): **medium**

Section 3: Performance

Effectiveness

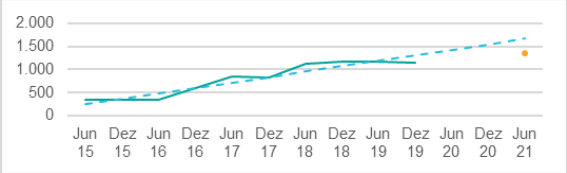
HH Access Cooking

Targets: 1,725,000 Achieved: 1,253,328



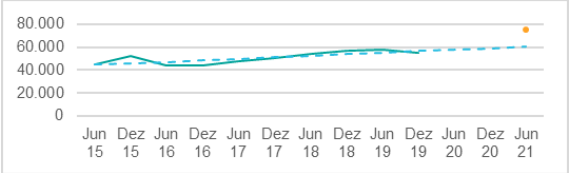
SI Access

Target: 1,350 Achieved: 1,140



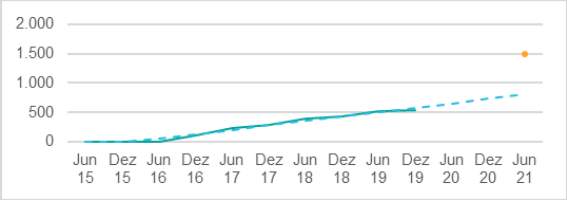
HH Access Electricity

Targets: 75,000 Achieved: 54,697



PU Access

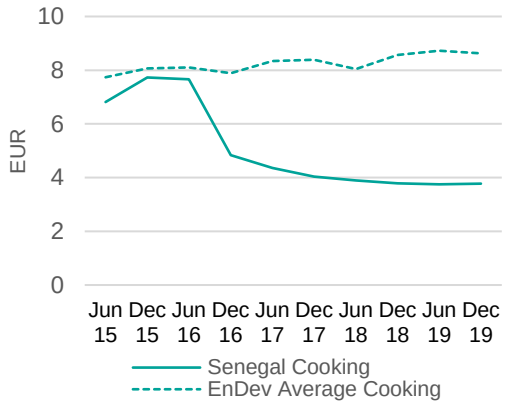
Target: 1,500 Achieved: 548

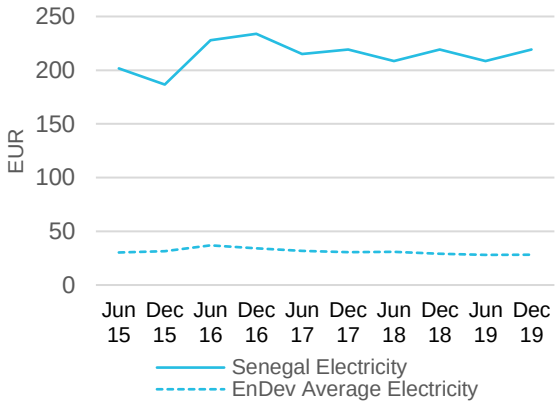


Additional info

- **HH Access Electricity**: Due to lack of maintenance 20 of the 80 mini-grids supported by EnDev are not functional; this contributes to results for HH access electricity which are behind planned progress; with mini-grids becoming operational in coming months effectiveness in this area target figures should be reached. Generally, achieving figures for HH access electricity has been in the past a challenge in Senegal as the government focused on larger off-grid solutions like mini-grids; during recent years government support increased also for smaller, decentral solutions like SHS, picoPV and related financial solutions like PAYGO; EnDev is about to integrate PAYGO solutions into its portfolio, thus most likely triggering higher results.
- **PU Access**: Target figures reflect reprogramming in 2019; planning for PU access measures was delayed due to COVID-19 and due to necessary alignment with EnDev-GCF and GBE project planning; this alignment now completed, EnDev will start PU access measures based on a baseline study to identify activities with high potential for scaling and a PU access support concept. It is planned to roll out PU access measures full scale as of 2021, then fully contributing to target figures.

Efficiency





Additional info

- **Cooking efficiency:** The very high efficiency of EnDev cooking activities in Senegal is even higher than reflected in the above curve: the ICS data collection for 2019 report was restricted to 10 months (= shallow curve) due to new reporting deadlines. When including the sales of November and December 2019, the market increased by > 30% compared to 2017, triggering thereby higher overall efficiency.
- **Electricity efficiency:** The low cost efficiency in rural electrification is due to relatively expensive technologies (some 80 mini grids) supported by EnDev; as outlined above, this approach was demanded by the government, which made the promotion of less expensive technologies with high scaling potential like SHS and picoPV difficult. Investment costs per person are especially high as potential users of the 20 not functional mini-grids supported by EnDev do not count for the results; additionally, necessary investments in higher quality and improved sustainability of mini-grids do not increase the number of people with access to electricity and contribute to relatively low efficiency.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity sector

The operator-based rural electrification approach of EnDev is not really a ‘market’. The key structural problem of the off-grid fee-for-service sector is the incomplete introduction of the tariff harmonization by the government of Senegal, which has led to user frustration and refusal to pay. Further growth in the sector depends on the resolution of the tarification problem. Reverting the downturn caused by COVID-19 will need an extra-effort. The market development of productive use of electricity is still in a pre-commercial market phase. Many promising PU technologies (e.g. milk cooling, agro-processing etc.) are still in a testing phase and only supported on larger scale once successfully field-tested. The development of energy-based services in rural communities is another promising approach for scaling PU technologies and markets.

Cooking sector

EnDev supported the ICS market development in 8 of 14 regions of Senegal for up to 14 years. At 12/2019, the majority (29/46) of market development indicators were in the ‘expansion phase’, and 6 indicators already progressed into ‘maturity’ level. This is great progress compared to the ‘without’ situation in the 6 regions where the EnDev-GCF project will start to work now. The EnDev-GCF project will expand the market to the 6 remaining regions and massively address the remaining requirements for market growth in the old regions, especially with regard to the development of ‘business and marketing skills’ and the improvement of ‘access to finance’. Additionally, EnDev works on economically feasible PU solutions for sustainable use of biomass where a large potential for improved efficiency has been identified (e.g. for wide-spread fish processing activities).

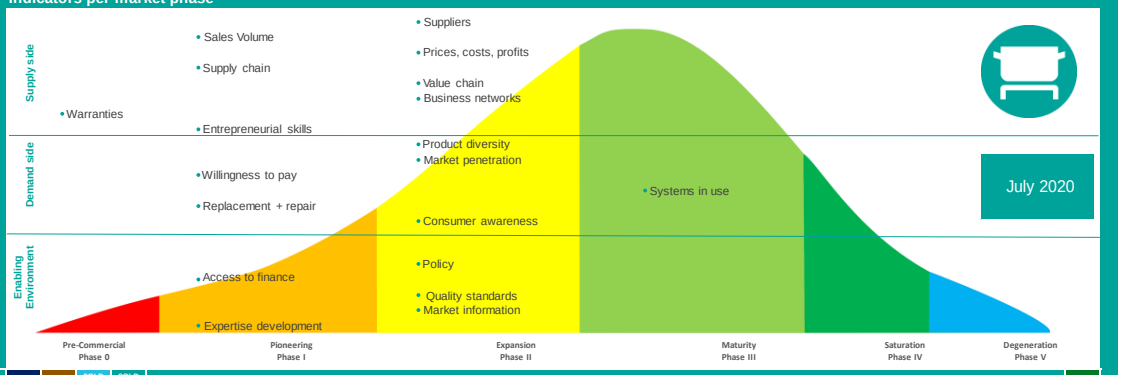
Impact of COVID-19

COVID-19 forced the government to lockdown the country for 2-3 months. Markets were closed, many households lost income opportunities. ICS producers and distributors were cut-off from their clients, they are facing financial liquidity problems and lack access to raw materials. This is reflected in the market scorecard below: roughly a third (14/46) of all indicators dropped one level. The market experienced a serious deterioration and stepped backwards into a late “Pioneering Phase I”.

Summary EnDev Market Scorecard: Senegal 8OLD July 2020 Improved cookstoves

Market: The ICS market in Senegal (old 8 regions: Dakar, Diourbel, Fatick, Kaffrine, Kaolack, Louga, Saint-Louis, Thies) in which EnDev is working since 5-14 years and the other 6 new regions (Kedougou, Kolda, Matam, Sédiou, Tambacounda) where EnDev so far did not do active promotion of ICS experienced a strong expansion compared with the previous year (sales: +15%). The market expansion was driven especially by professional (Prof) and business class (BC) producers. Neverthless, the stakeholder structure on the production level is currently dominated by artisanal producers (ca. 220) with a market share of about 40%.

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	-

Indicators		Variables	Senegal 2018	Senegal 2019-I	8OLD Dec 2019	8OLD July 2020	Explanation	6NEW Dec19
S1 Suppliers	S1V1	Businesses	↑	↗	↗	↗	Since January 2020 about ten employees in the ICS sector have established their own business.	→
	S1V2	Business modalities	↗	↗	↗	↘	COVID-19 negatively impacts employment in senegalese ICS sector. Especially, some employees of the most professionalised producers lost their jobs.	→
	S1V3	Formality	↗	↗	↗	↓	The chambers of commerce and crafts have slowed down their administrativ activities in the course of the pandemic, thus producers were not able to renew their business cards.	→
	S1V4	Jobs created	↗	↗	↑	↘	Employment in the ICS sector is impacted negatively by COVID-19. Some employees of especially the most professionalised producers lost their jobs.	→
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↗	↓	In January and February '20 ICS sales continued to increase compared to the same months of the previous year. However, sales dropped sharply from March '20 onwards. We expect, that sales figures will start slightly to recover from July '20 onwards.	→
	S2V2	Inventory turnover	↗	↗	↗	↘	Shrinking sales in line with lower demad have recently led to an overall slump of ICS sales. Thus, we estimate a decrease in the overall inventory turnover ratio	↓
S3 Prices, costs and profits	S3V1	Prices	↗	▯	↗	→	During the pandemic, we could not observe higher price competition in the ICS sector	▽
	S3V2	Costs	→	↑	↗	↘	Due to the travel restrictions, raw material suppliers were locked down in their home regions. Thus, raw materials became scarce and expensive. Furthermore, transportation costs increased.	↓
	S3V3	Profit margin	↗	↑	↗	↓	In the course of the crisis ICS sales have decreased by ca. 30%. At the same time production costs have increased. Overall profit margin decreased in the sector.	▽
	S3V4	Investments	↑	↗	↑	→	Some Prof and BC producers are aiming to establish a vertically integrated business model through investments in up- and downstream stages in the ICS supply chain. COVID-19 may require a revision of their investment strategy	▽
S4 Supply chain and after-sales service	S4V1	Length	↗	↗	↗	→	The ICS supply chain is horizontally integrated. Input provision, ceramic lining, production, distribution, and retail are done by different entitites.	↓
	S4V2	Distribution channels	↗	↑	↗	↓	During the pandemic, many producers were not able to stay in touch with distributors, thus we observed distortions in the distribution channel. Furthermore, raw material suppliers were locked down in their home regions, due to the travel restrictions.	↓
	S4V3	Spatial reach	↗	↑	→	↘	Imposed travel restrictions by the government impacted the interregional transportation and distribution of ICS negatively. Lifting up the restriction may lead to an increase of distribution activities.	↓
	S4V4	Initial suppliers	▯	↑	↗	↘	Due to travel restriction many raw material suppliers were locked up in their regions. Thus, raw materials became scarce and expensive. Lifting up the restriction may lead to an increase of distribution activities.	↓
	S4V5	After-sales service	→	↑	→	↘	In all eight regions producers are offering repair services. Broken ICS can be handed out directly in the workshops of ICS producers. However, the closure of markets made this service unavailable.	↓
S5 Value chain	S5V1	Value added	▯	↑	↗	↓	Value added is increasing	▯
S6 Business networks	S6V1	Networks	▯	↗	↑	↗	In cooperation with the chamber of commerce, EnDev supported the establishement of seven regional associations for ICS production.	↓
	S6V2	Partnerships	↗	↑	↗	↓	The most professionalised producers are offering trade credits to retailers and women groups. Due to increasing liquidity problems it is assumed that the provision of trade credit has decreased in the course of the pandemic.	↓
S7 Warranties	S7V1	Warranties	▯	▯	→	→	A formally established warranty system does not exist.	↓
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	▯	↗	↗	Business class and a fraction of professional producers are starting to improve their business skills. However, the majority of producers, especially artisanals, are lacking business skills.	↓
	S8V2	Satisfaction level	↗	▯	↑	↗	Producers are appreciating and are satisfied with EnDev's interventions, thus a strong stakeholder cooperation is taking place. The satisfaction level increased by the approval of the GCF/EnDev project. However, the ongoing pandemic raised uncertainty in the sector.	↓
	S8V3	Marketing skills	→	↗	→	→	In general marketing skills are limited in the ICS sector. However, some business class and professionals are developing commercial promotions during religious events (Tabaski, Magal, Korité, Gamou) and also participate in fairs to exhibit and sell their products.	↓
	S8V4	Advertising	↗	↗	↗	↘	Advertising is done by suppliers using posters or billboards as well as Facebook and WhatsApp. BC and some Prof producers also participate in fairs to exhibit and sell their products. In course of COVID-19 we have not observed advertising activities in a bigger extent.	↓
	S8V5	Production automatization	↗	↑	→	→	In special workshops producers have been trained in the optimisation and automatization of their production processes. A major part of them received technical assistance in the form of equipment. Producers were also trained in the organization of work (division of labor), also in terms of work safety.	↓
	S8V6	Standardized production	↗	↗	→	→	Although, standards for ceramic lining and the construction of metal parts of ICS are established (validated by ASM), some producers do not respect and apply these standards. CERER supports the standardization through training workshops. EnDev is distributing stickers for respecting these standards	↓
D1 Product diversity	D1V1	Diversity	→	↑	↗	↗	A variation of different types of ICS exists, thus different needs of households in terms of ICS-size and regional fuel disponibility can be adressed	↗
D2 Market penetration	D2V1	Market penetration	↗	↗	↗	↘	Innovations driven by producers are taking place, e.g. an ICS with feet, which is well adopted from senegalese households. This ICS had a market share of about 35% in 2019. We estimate that the market penetration will slow down in the course of COVID-19.	→
D3 Willingness to pay	D3V1	Willingness to pay	↗	▯	↗	↓	The willingness to pay for ICS decreased, due to lost income opportunities on household level and changing consumer preferences.	↗
D4 Systems in use	D4V1	Usage rate	↗	↑	↗	↑	A recently commisionned study, conducted in St. Louis and Kaffrine, shows, that the probability to use an ICS on a daily basis increases by 65%, after owning it. However, about 25% of the households did not fully adopt the ICS. We assume that the usage rate has not changed significantlly in the course of the panedemic.	↑
	D4V2	Maintenance	↗	↑	→	→	Almost all users know how to maintain and use the ICS.	↗
D5 Replacement and repair	D5V1	Replacement rate	↗	↑	→	↓	We assume that replacements during the pandemic are low due to decreasing purchasing power and changing customers preferences.	▯
	D5V2	Repair rate	↗	↑	↗	↓	Broken ceramic lining will always be repaired by producers. However, due to the closure of markets, we're assuming that the repair rate has decreased in the course of the pandemic due to the closure of markets.	↓
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↗	→	Sales of ICS are often accompanied with demonstrativ awareness-raising campaigns about health-related benefits of ICS use, cooking demonstration as well as animations etc. We estimate conservatively that more than 30% of the potential clients are aware about the technology. However, in the upcoming days/months, EnDev will emphasize the health-related benefits of ICS-use through radio spots.	↓
	D6V2	Perception	↗	↗	↗	↘	Due to changing consumer preferences, EnDev will strengthen the positive perception of ICS use by emphasizing the health-related benefits of ICS-use through TV/radio spots.	↓
E1 Policy	E1V1	National plans	→	↑	↗	↓	Due to decreasing ICS sales and demand, we observe that COVID-19 has an significant negativ impact on the NDC targets.	↗
	E1V2	Policy	→	↑	↗	→	COVID-19 is negatively affecting the implementation of different project activities to consolidate national policies.	↑
	E1V3	Product taxes	→	↑	▯	▯	All parts of ICS are being constructed in Senegal	▯
	E1V4	Business taxes	→	↑	↗	↓	We are assuming that the rate of tax paying in the sector has decreased in the course of COVID-19.	→
E2 Access to finance	E2V1	Subsidies	→	↑	↗	↗	Donor subsidies for production are being phased out (20% to 0%). There is no subsidy on the finished product. However, EnDev will provision input factors and raw materials to re-boost ICS production.	↑
	E2V2	Financing options suppliers	↗	▯	↗	↓	In the course of the crisis financial institutions are much more reluctant and the sector may have to rely even more on donors. Awareness campaigns for microfinance institutions about the ICS sector have been temporarily suspended due to the crisis.	↓
	E2V3	Financing options consumers	↗	↗	↑	↓	Due to liquidity problems, we are assuming that BC and a part of Prof producers have limited the offer of instalment payments/trade credits.	→
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	↗	↗	↗	CERER and its partner organisations are working on norms and standards for the ICS sector. We do not have any information how COVID-19 has impacted this indicator.	→
	E3V2	Enforcement	→	↑	→	→	Although, standards for ceramic lining and the construction of metal parts of ICS are established (validated by ASM), just a bunch of producers do not respect fully these standards.	↗
E4 Market information	E4V1	Cost of information	↗	▯	↗	↗	Access to information is facilitated by donors, commissioning studies on behalf of the state.	▯
	E4V2	Market facilitation organizations	↗	▯	↗	↗	In preparation of the GCF funding, EnDev identified national NGOs (Enda Energie, Enda Ecopop and CONCEPT) to become new executing partners to reach all rural areas in Senegal. Unfortunately, COVID-19 is delaying the contract process.	↓
	E4V3	Awareness campaigns	↗	↑	-	-	Awareness campaigns are currently donor driven. No governmental support. However, after 4-15 years of intervention in these eight regions, there is no need anymore of donor driven awarenes raising campaigns, thus this variable can not describe the situation in Senegal.	→
E5 Expertise development	E5V1	Courses	▯	↗	-	-	After 15 years of EnDev-intervention there is currently no higher need to conduct special courses in the eight regions, thus this varibale does not reflect the situation in Senegal. Especially, in consideration that the project FASEN will handed over to the EnDev/GCF project	↓
	E5V2	BDT	→	↑	↗	↗	Donors, as Réussir au Sénégal and PRODER have conducted capacity building workshops in management and marketing.	↓
	E5V3	User training	→	↑	-	-	After 15 years of EnDev-intervention users in the eight regions have deep knowledge how to use and maintain ICS, thus there is no need to conduct user trainings. Especially, in consideration that the project FASEN will handed over to the EnDev/GCF project. However, EnDev distributes always flyers how to use ICS correctly.	↓

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Contribution to **coordinated planning of mini-grids and grid-extension** of ministries and donors (e.g. development of instruments like a geospatial planning tool). • Further support to the **harmonization of electricity tariffs** (incl. mini-grids). • **Transfer of concepts and experiences** for improved sustainability of mini-grid to relevant stakeholders.
Supply side	• Support operators in maintaining and rehabilitating village mini-grid installations and **reduce vulnerability of systems** against crises like COVID-19 (e.g. low-maintenance equipment). • Introduction and scaling of **technical solutions for better applicability of harmonized tariffs** in off-grid installations. • **Rehabilitation of dysfunctional mini-grids** based on a more sustainable technical and economic concept. • Increase **distribution of PAYGO products** in EnDev's implementation zone through women groups. • Revitalize ICS/biomass enterprises through **input-provisions and bulk-orders** (rebuild liquidity) to mitigate COVID-19 impact. • Based on identified "low hanging fruits": developing local production and distribution structures for efficient **productive use of biomass energy technologies** (e.g. fish processing). • Depending on future programming of the World Bank PROGEDE project EnDev might engage on small scale in strengthening **supply of biomass** through selected activities e.g. with regard to sustainable forest management.
Demand side	• Extending government **subsidy on electricity bills** (for customers of the utility) to clients of 'off-grid' operators as a COVID-19 mitigation measure. • Promotional **marketing activities and awareness-raising** campaigns in TV/Radio about health-related benefits of ICS use and the importance of kitchen ventilation. • Stimulating demand for PAYGO products and PU technologies in EnDev target villages including **reduction of financial barriers** and **focus on rural agricultural associations** (cooperatives, farmer/women groups etc.). • Sensibilization measures to raise awareness among rural **micro-enterprises and women groups** on efficient biomass energy technologies for their businesses; there is high potential for market development as long as the pay-back time and the investment-barrier are acceptable (baseline study on-going but delayed by COVID-19).

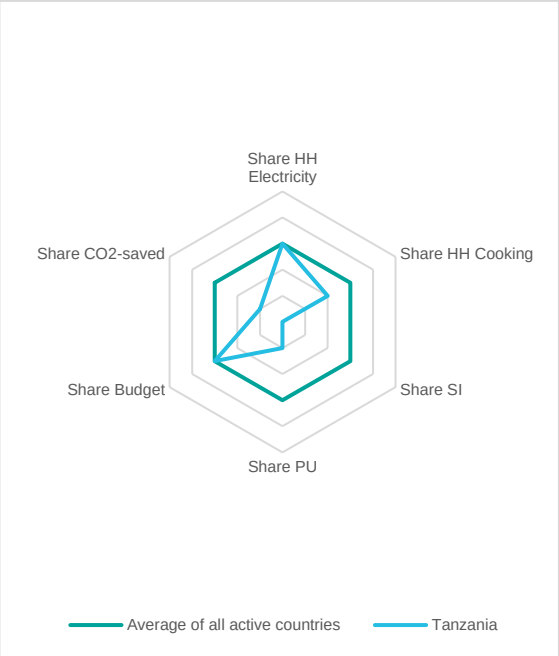
Tanzania

Section 1: Key facts

Country facts	
Population	58.0 million
HDI	159 ↓ | Total (0.53)
UN Classification	LDC
Access clean cooking	7 % urban < 5% rural
Access electricity	68 % urban 19 % rural

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
Implementer	SNV
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• High relevance of **clean cooking and access to electricity** as EnDev's key intervention areas in Tanzania (ICS access < 5 % in rural areas; firewood consumption by 85% of the rural population; electricity access rates of about 13 % in less developed rural markets). • Ambitious grid extension programme (75 % coverage by 2025), but modest progress, hence, **huge, untapped potential for off-grid solar** in coming years. • EnDev supported professionalization of ICS and solar companies to reach semi-industrial production levels in line with government's strong **focus on industrialization** and raising **environmental awareness**. • EnDev is a **crucial actor with access to national and local actors** in Tanzania to support further ICS and solar promotion despite a **challenging environment** (dispersed responsibilities for ICS in government institutions; off-grid strategy and role of private solar companies still to be clarified).
Contribution to paradigm shift	• Growth support by ttailoring RBF design for a **re-focusing on mature solar market actor behaviour** triggering a 25% increase in quality sales to under-developed and nascent markets e.g. for vulnerable groups and in rural areas. • **Scaling of supply-side ICS approaches** building resilient cooking enterprises demonstrating high growth rates per annum (25-30%) via purely local market driven expansion free of end-consumer subsidies. • **ICS sector professionalization** by enhancing evidenced demand-side value propositions in product branding and local Behaviour Change Communication (BCC) consumer campaigns. • Supporting **transition through adjusted incentive schemes** by expanding performance based non-financial asset incentives with small cooking enterprises to post-sales financial RBF incentives amongst producers with **semi-industrial production scaling** ambitions. • Future focus on **PU access promotion** applying incentive and reward schemes based on market vulnerability and customer satisfaction benchmarks as well as on international quality assessments (e.g. CLASP-LEAP quality assessments). • **Exceptional PU programme positioning** with well-established domestic solar RBF Fund to support transition of mature market actors'intended diversification to agricultural and small enterprise productive use markets.
Important collaborations for scaling up	**Funding and investment** • Close cooperation (and shared project management structures) with the **RESPOND project** (funded by BMZ-GIZ Tanzania, 1,6 Million Euro, 2018-2020) – under the special initiative for refugees, improving host and refugee communities energy access backed with technical support of EnDev's

	cooking-solar component (ICS introduction; efficient fuel consumption; replacing wood as lighting energy by solar; reforestation). • A large-scale **EU-financed ICS project** is in preparation with a focus on urban areas; EnDev will look for cooperation and synergy potential.
	Implementation • Scaling mostly through **regional and local government agreements** in support of solar and ICS companies (EnDev is one of the few projects with this level of government support). • Cooperation with and support to the **Tanzania Renewable Energy Association (TAREA)** as the main actor to bridge articulated government energy access priorities in ICS standards and electrification scaling. • Through cooperation with TAREA also support to clarifying sector roles and accelerating responsiveness to the **Global Association for the Off-grid Solar Energy Industry (GOGLA)** platform. • Scaling quality in ICS and solar markets through cooperation with **local universities** (ICS laboratory capacities) and **CLASP** Quality Assurance Programme. • Cooperation on finance mechanisms for scaling together with the **Tanzania Investment Bank.**
	Knowledge sharing and learning • Development and sharing of applied approaches in outcome based results financing via partnerships with *Acumen/60.Decibles* for applying industry leading *Lean Data Benchmarks* in **customer and employee satisfaction**. Generated data is fed in international data banks, EnDev being the only source of such data from Tanzania.
Gender	• A **gender analysis** has not been realized yet but is planned in the frame of a larger contract with ENERGIA/HIVOS. • Gender aspects are already to a large extent integrated in the EnDev Tanzania approach: (i) **Women-led stove businesses** continue to account for ~45% of projects producer base while delivering greater than ~55% of annual recorded sales; (ii) Building on this SNV has adapted the SNV's Participatory Actions Learning for Sustainability (PALS) for household dialogues to advance **women's cooking enterprise leadership**. Initial pilot indicates +20% sales increase amongst women-led enterprises within 6 months post-PALS; (iii) Integration of a **Women Empowerment Fund** into PU activities to reward firms for providing and sustaining management level and skilled technical employments for women professionals with technical post-secondary specializations.

Consideration of ITAC recommendations

National and regional scaling via improved ICS Standards and Labelling: Demand side measures applying Behaviour Change Communication (BCC) strategies have been developed in parallel to professional product re-branding based on evidence from 2013-18 consumer value propositions. Initial trade fair testing of new brand has been award winning amongst exhibitors. Support to TAREA has seen advancement by the government to formally gazetting an ICS standard to ISO provisions. Programme flagship stoves first to undergo standard testing and certification will be integrated to the renewed brand. High potential to scale marketable and certified demand side measures in conjunction with continued supply-side supports to regional partners in Burundi, DRC and Rwanda.

Enhance Technology Inclusion Frameworks for PU: As product orientations diversify from household solar under Lighting Global Frameworks, a renewed focus to Quality Assessment (QA) frameworks for PU applications has been initiated. Definitions will allow rolling inclusion for new applications given the continuous new development of dedicated agricultural and productive small enterprise appliances entering markets annually. The programme will apply progressive product eligibility by first assessing the productive benefit to intended end users upon which subsequent QA testing will be provided by CLASP. By this, EnDev is pioneering a PU QA process for selected PU products which should be also interesting to other EnDev projects.

Coordination of Domestic Solar / PU / Cooking Components: Programme design aims to exploit complementary dynamics of players. Intended PU intervention builds upon initial diversification and scaling within the existing roster and markets of domestic solar RBF firms. Partnerships across commercial solar and semi-formal stove enterprises is typically limited; however, synergies in performance-based incentives and local market intelligence are used and re-enforced.

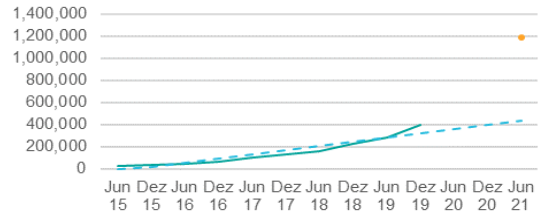
Quality of response to ITAC recommendations (on a scala from low-medium-high): **medium**

Section 3: Performance

Effectiveness

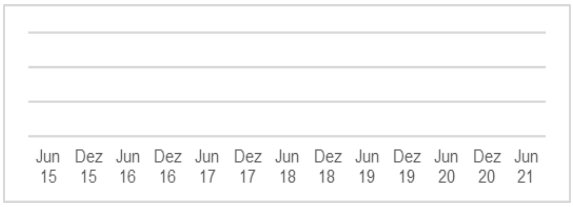
HH Access Cooking

Targets: 1,185,000 Achieved: 397,000



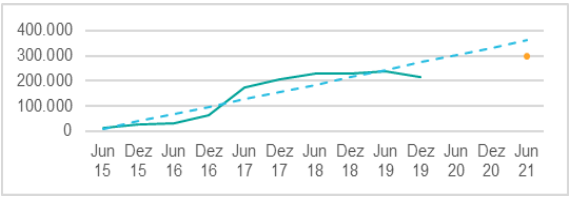
SI Access

Targets: 0.0 Achieved: 0.0



HH Access Electricity

Targets: 300,000 Achieved: 241,545



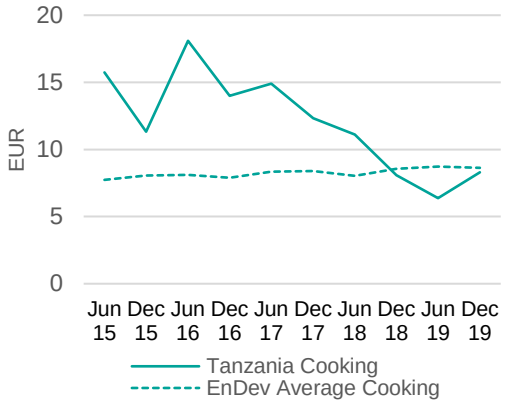
PU Access

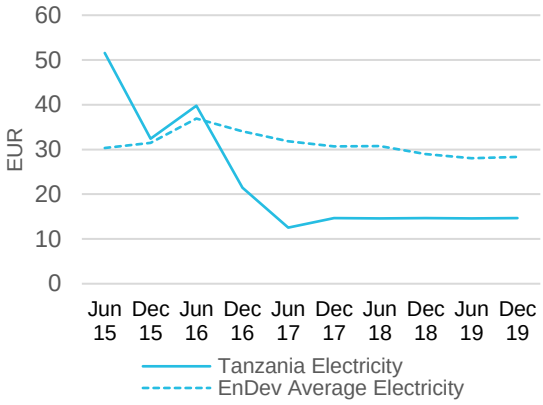
Targets: 11,500 Achieved: 184

Additional information

- Continued **ICS sales** growth during Q4.2019. Early results 2020 demonstrate local ICS entrepreneurs capable of navigating in COVID-19 with normalizing growth trend Q3.2020.
- **Cooking targets** shown in the graph are foreseen for the end 2022. The growth of ICS figures in 2020 and 2021 is on track for reaching the assigned target. The ongoing professionalization work with most advanced ICS producers to reach semi-industrial level production will exponentially increase sales volume in 2021/2022. However, the modelling does not take into account the negative impact of COVID-19 economic recession on stove sales.
- Slight dropping of **access electricity** figures in 2019 due to refocusing the RBF solar incentives to vulnerable markets and customer satisfaction benchmarks. Early results from 2020 indicate returning growth trajectory; however, COVID-19 predicated a 60% decline from average peak sales in Q2-3.2020.
- **PU access component** only scheduled for active implementation as of 03/2021 with an inception phase starting in October 2020. No SI component in Tanzania.

Efficiency





Additional information

- **Cooking efficiency**: Delivery cost improvement to EnDev average for cooking as programme scales throughout its lifespan. Delivery cost increase in Q4.2019 due to first stage preparations for new demand-side and access to finance activities.
- **Electricity efficiency**: Delivery cost only ~50% of global average for electricity with high private sector leverage ratio (6.3:1). Achieved inclusive of revised design directing the incentive reward to the best customer service delivery in the most vulnerable and underserved rural markets.

Section 4: Potential

Assessment of (sub-)sector and/or market development

Electricity Sector

Growth in access reaching 36% of households nationally displays stark urban (68%) and rural (19%) contrasts. Regional variations are significant – less developed rural markets under EnDev have an average 12.74% access to electricity. While state efforts aim for universal grid access by 2030, actual growth in access averages 1% annually. Solar plays a prominent role in domestic agendas with two-thirds of rural electrified households via solar. Maturing solar market companies continue to consolidate operations and market focus. Firms have progressed in articulating and testing diversification strategies for wider agricultural productive uses and income generating appliances into business models. The presently developed Microfinance Regulation Act may challenge the PAYGO sector's business models as it is unclear if PAYGO systems will be considered as microfinance systems or not. The renewable energy sector has opposed the measure of being considered an MFI system as PAYGO payments are based on energy consumption.

Cooking Sector

Families universally rely on biomass for cooking with firewood (60.9%) alongside charcoal (28.8%) recorded in households. In rural areas, firewood (84.8%) and charcoal (11.8%) consumption are starkly contrasted to urban firewood (17.4%) and charcoal (16.5%) usage. Enforced biomass regulation has increased resulting in biomass fuel cost increases that have heightened improved cooking demands. The government has introduced a formal ISO compliant ICS standard, signalling interest towards sector professionalization. The promotion of LPG as cooking fuel remains a priority of the government, too.

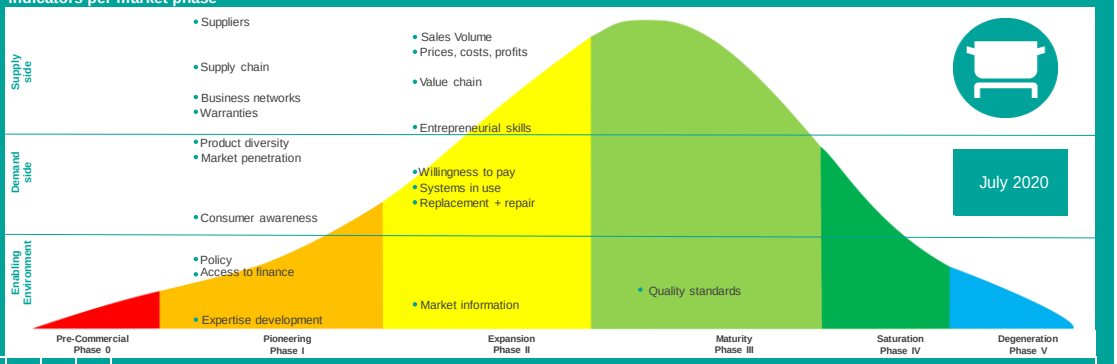
Impact of COVID-19

COVID-19 impacts beginning in Q1.2020 with import declines due to global manufacturing shutdowns. Q2.2020 pandemic emergence in Tanzania lead to suspensions in product distribution. PAYGO firms, representing 90% of EnDev supported players, are confronted with reduced customer repayment abilities. Overall 60-75% decline in sales recorded amongst firms with limited Q3.2020 recovery as customers hedge new purchase risks and firms reactivate paused distribution channels. In the cooking sector, the EnDev programme has indications of a slight downward trend (minus 10-15%) that would influence targeting due to the economic slowdown. The government continues to focus on the environmental-economic impacts of energy supporting industrialization and particularly economic recovery of vulnerable (interior) markets post-COVID-19. The EnDev programme is accompanying this focus by setting up a Green Economic Recovery Fund for off-grid solar suppliers in Tanzania.

Summary EnDev Market Scorecard: Tanzania July 2020 Improved cookstoves

Market: Supply and demand side dynamics are within scope of the program's direct producer roster market. Enabling environment considerations at national sector level. COVID-19 period reflects national measures GoT of limited lockdown Mar/Aprlifting towards normal market resumption in May.

Indicators per market phase



Market trends

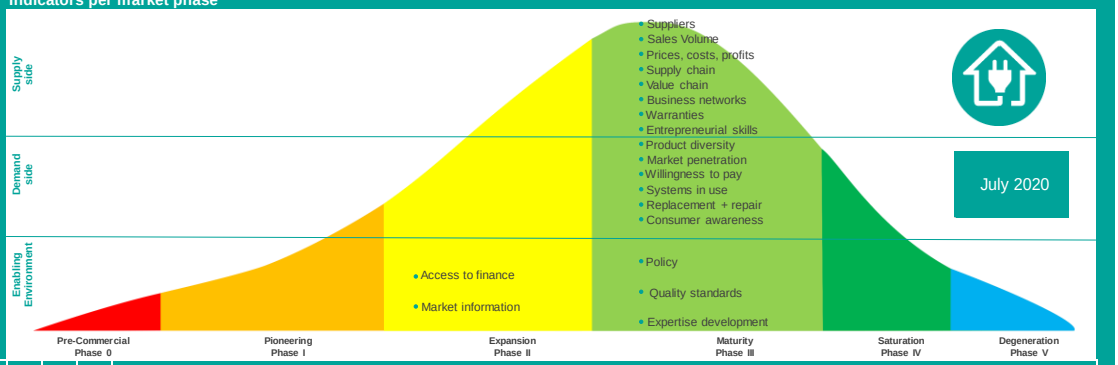
Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators		Variables	2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	↗	↗	→	Intake of new producers to producers partially through Q1.2020 to Souther Zone Tz. New intakes suspended due to COVID-19 until Q3-4.2020.
	S1V2	Business modalities	↗	↑	→	Avg. monthly sales volume decreases by 10% in Mar/Apr with stabilization and return to measured growth amongst core producer toward peak market season beginning July 2020.
	S1V3	Formality	↔	↑	↑	Increase amongst core producers to formalization for eligibility to advanced program supports. Increasing formal private sector envionment Tz. Unaltered by COVID-19
	S1V4	Jobs created	↑	↑	→	Core producers new part-time employee growth during uncertainty in COVID-19.
S2 Sales Volume	S2V1	Products / services sold	↑	↑	↘	Avg. monthly sales volume decreases by 10% in Mar/Apr with stabilization and return to measured growth of 10-20% amongst core producers at the beginning of Jun/Jul.
	S2V2	Inventory turnover	↔	↑	→	Turnover of product in direct relation to recorded sales increases.
S3 Prices, costs and profits	S3V1	Prices	↔	↗	→	Increased indications from producer roster of price competition as scaled operators are able to sell at lower prices than less developed counterparts. Limited change due to COVID-19.
	S3V2	Costs	↗	→	↘	Some increases in costs due to increased material expenses during COVID-19.
	S3V3	Profit margin	→	↑	↘	General price point conformity leads to a declining profit margin potential amongst scaling enteprises.
	S3V4	Investments	↘	↗	→	Enterprises pause re-investment to enteprise pending COVID-19-uncertainty.
S4 Supply chain and after-sales service	S4V1	Length	→	↑	↘	Use of third party market sales agents amongst scaling producers in core roster and inter-producer component trading continues - albeit at lower pace during COVID-19.
	S4V2	Distribution channels	↗	↗	↘	Use of third party market sales agents amongst scaling producers in core roster brings product closer to wider consumer segments slows during COVID-19.
	S4V3	Spatial reach	↗	↑	↘	Use of third party market sales agents amongst scaling producers in core roster slows during COVID-19.
	S4V4	Initial suppliers	↗	↑	→	Inter-producer trade of components (liners, frames) amongst producers slows and new roster of ICS producers in program at wider national extents are paused during COVID-19.
	S4V5	After-sales service	→	↗	↘	Nascent repair-replacement services by producers retract to customers in their most immediate production-sales locality.
S5 Value chain	S5V1	Value added	→	↗	↘	Value added via inter-producers component trading and retailing with third party market agents declines during Q2 COVID-19 slowdown.
S6 Business networks	S6V1	Networks	↘	↑	→	Tanzania Renewable Energy Association (TAREA) continues formal realtionship with the program; although advocacy activities are limited during COVID-19.
	S6V2	Partnerships	→	↗	↔	Increased use of third party market sales agents. Credit provision is mixed per producer. Uneven relation effects during COVID-19.
S7 Warranties	S7V1	Warranties	→	↗	→	Nascent repair-replacement services by producers retract to customers in their most immediate production-sales locality.
S8 Entrepreneurial skills	S8V1	Financial literacy	↑	↗	↗	In person advisory-coaching services of program during COVID-19 are paused and are provided through tele-advisory supports.
	S8V2	Satisfaction level	↑	↑	↑	Enterprises continue to recognize improved positive scenario of business - benefits of independent income generation are enhanced during COVID-19.
	S8V3	Marketing skills	→	→	→	In transition from EnDev 2 to EnDev 3, consolidation and rebranding of flagship product. Temporary retraction in support to self marketing of products by producers extends under COVID-19 in observation of health measure considerations.
	S8V4	Advertising	↘	↑	→	In transition from EnDev 2 to EnDev 3, consolidation and rebranding of flagship product. Enterprises advsertising of their business brand is limited due to COVID-19 restrictions.
	S8V5	Production automatization	→	↗	↗	Enterprises previously invested in additional personnel to maximize non-financial performance incentives availed by the program. Role division required to support sales growth in use of unit standardization equipment. Product standardization is unaltered during COVID-19.
	S8V6	Standardized production	↗	↗	↗	Enterprises previously invested in additional personnel to maximize non-financial performance incentives availed by the program. Role division required to support sales growth in use of unit standardization equipment. Product standardization is unaltered during COVID-19.
D1 Product diversity	D1V1	Diversity	↗	→	→	Flagship unit of program stabilizes footing amongst standig ICS units previously offered by producers.
D2 Market penetration	D2V1	Market penetration	↑	↑	↗	Scaling core producers expand market reach from immediate rural vicinity to deeper rural and urban centres slows from previous positive trend in Mar-May due to COVID-19.
D3 Willingness to pay	D3V1	Willingness to pay	↑	↗	→	Amongst consumers with experience of the product, WTP is strong; however, ability to pay constrained due to COVID-19. Brand reconsolidation targeting wider market base is refined with limited piloting resuming in Jun.2020 due to COVID-19.
D4 Systems in use	D4V1	Usage rate	↗	↗	↗	Use of product is reported by focus groups as positive due to performance of the unit and dual fuel potential. Unaltered by COVID.
	D4V2	Maintenance	▽	▽	▽	Use of product is straight forward with limited needs of instruction at point of sale. Limited indication of focus groups of product use-maintenance challenges. Unaltered by COVID-19.
D5 Replacement and repair	D5V1	Replacement rate	↑	↑	↗	Focus group indications of loyalty to program promoted unit is strong given high satisfaction with performance. Increased need for making product more easily identifiable underway through branding consolidation. Limited alteration due to COVID-19.
	D5V2	Repair rate	→	↗	→	Nascent repair-replacement services are limited to customers in their most immediate market vicinity of producer production / sales.
D6 Consumer awareness and perception	D6V1	Awareness	→	↑	↗	Focus group indications of product is positive. Re-branding consolidation to improve recognition of unit and clearer promotion of benefits as based on identified value proposition of focus groups continues; although awareness raising-growth slows due to COVID-19.
	D6V2	Perception	↗	↑	↑	Focus group indications of product is positive. Re-branding consolidation to improve recognition of unit and clearer promotion of benefits as based on identified value proposition of focus groupsc continues. User perception unaltered due to COVID-19.
E1 Policy	E1V1	National plans	↑	▽	▽	Cooking energy is referenced at central government level; however, targeting is almost exclusively focused to LPG. Biomass cooking is supported in line with environmental conservation and regulation of charcoal supply chain. National plans unaltered due to COVID-19.
	E1V2	Policy	↑	↑	▽	Charcoal supply chain regulation continues. Biomass cook stove standard in gazetted Q2.2020.
	E1V3	Product taxes	→	→	→	Tax relief in cooking energy related to LPG only. Increased taxation of biomass fuels through charcoal supply chain regulation. Taxation unaltered due to COVID-19.
	E1V4	Business taxes	→	→	→	Scale of formal and informal enterprises place them at levels in under threshold to remitting taxes. Business taxation unaltered due to COVID-19.
E2 Access to finance	E2V1	Subsidies	→	↗	→	Consumer subsidies are not supported by program. Rarely included in public-private programs as cost point of locally manufactured products is accessible to majority of consumers. Unaltered due to COVID-19
	E2V2	Financing options suppliers	↓	→	↘	Cost of commercial financing is too high (+20%) relative to scale of the majority of cooking enterprises. Rate of return would not be positive relative to lending potential. Lending environment declines due to COVID-19.
	E2V3	Financing options consumers	→	→	↘	Credit provision to consumers by enteprises is not advisable given the scale of present operations. Product price points are too low for lending by financial institutions. Overall lending environment declines due to COVID-19.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	→	↑	▽	National biomass cook stove gazetted Q2.2020; although implementation is not well articulated.
	E3V2	Enforcement	→	→	↗	Enforcement of charcoal supply chain is unchanged from 2018. Biomass cooks stove standard is formalized, but enforcement is not articulated.
E4 Market information	E4V1	Cost of information	↗	→	↗	Market information is supported via knowedge networking of programs with increased frequency-vigilance to navigate COVID-19 impacts in the sector.
	E4V2	Market facilitation organizations	→	↗	→	Sustained role of TAREA as GoT-private sector intermediary in cooking energy space. Increasing role paused due to COVID-19.
	E4V3	Awareness campaigns	↑	↑	↑	Government support continues through the support to Vice President's Office Nat'l Environment Day as focal COVID-19 re-opening agenda. Support to TAREA National Renewable Energy Day in Q3 foreseen to continue without limitation in Q3/4 2020.
E5 Expertise development	E5V1	Courses	→	↑	↓	Training provided by program paused due to COVID-19. To be re-initiated for new intakes in late Q3-early Q4.2020
	E5V2	BDT	↗	↑	↓	Training provided by program re-initiated for intakes in Q4.2020. All technical trainings are paired with business development supports.
	E5V3	User training	→	↗	→	Customer care-user training as an essential component at point of sales unaltered due to COVID-19. User focused BCC rollout deferred to late Q3/Q4 2020 due to COVID-19.

Summary EnDev Market Scorecard: Tanzania July 2020 Solar Products

Market: Supply and Demand side focus are within operating context of RBF 2; scoring based on result verification until Q2.2019. Enabling environment side at national level. COVID-19 period reflects national measures GoT of limited lockdown Mar/Apr lifting towards normal market resumption in May.

Indicators per market phase



Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators	Variables		2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	→	↗	↓	Consolidation amongst larger players with commerical takeovers and solidifying of niche market segment actors. Pre-COVID-19 struggling firms fail or suspend operations during pandemic.
	S1V2	Business modalities	→	↑	↘	Further reduction to market structures placement of operations and personnel deployment amongst established players are rapidly adjusted for survival of operations. Firms pause investment and activity in new PUE services and applicances.
	S1V3	Formality	↑	↑	↑	All firms in solar are formally registered. Unaltered by COVID-19 19.
	S1V4	Jobs created	↗	↑	↓	Wide range of roles from marketing, sales, installation and services. Some firm integrate R&D. Number of personnel terminated or suspended during peak pandemic and only grandual return open Q3.2020. Part time field sales agent activity declines noted with drop in commissioned sales.
S2 Sales Volume	S2V1	Products / services sold	↘	↗	↓	COVID-19 limitation to new import stocks from China began in Q1. Some players with diffuse in country operations and rural stock presence continue with lower volume sales while others suspend operations entirely. 60-75% decline in Apr-May sales from the norm.
	S2V2	Inventory turnover	↔	↗	↔	Inventory turnover continues due to the limited stock presence in Q1 caused by the COVID-19 global manufacturing slowdown.
S3 Prices, costs and profits	S3V1	Prices	→	↗	↔	Price competition amongst firms was a low priority for players during COVID-19. Modalities adjusted in varying stratgies to stem losses amongst existing consumer bases and hedge risk with new customers.
	S3V2	Costs	↔	↘	↔	Economies of scale are limited due to continuing formalization of tax regimes. Cost of sales further increasing with downturn operations and increased protection costs to employees due to COVID-19.
	S3V3	Profit margin	↔	↗	↓	Measured growth and business model consoldiation counterbalances the cost of sales increases to doing business in Tz.
	S3V4	Investments	↑	↑	↑	All firms heavily redirect and re-invest to ensure survival of operations during COVID-19 downturn.
S4 Supply chain and after-sales service	S4V1	Length	↔	↗	↔	Well elaborated supply chains (marketing, delivery, installation, after sales, etc) amongst all firms. Supply chains are adapted in variable fashion depending on business model of firm.
	S4V2	Distribution channels	↗	→	↔	Variable degree amongst firms to rapdily consolidate and pause market structure operations and personnel pending resumption of market activity.
	S4V3	Spatial reach	↘	↗	↘	Pause to market expansion and limitation of outreach to more remote market extents. However, agent-sales post structures are maintained during the first months of COVID-19.
	S4V4	Initial suppliers	↗	→	↘	Variable degree amongst firms to rapidily consolidate and pause market structure operations and personnel pending resumption of market activity. Limited physical foot print, increased attention to demand driven services via call centre services.
	S4V5	After-sales service	→	↗	↔	Aftersales is a standing offer amongst players. Extent and reach during COVID-19 variable depending on the modelling tech assistance of firms.
S5 Value chain	S5V1	Value added	→	→	↓	Well elaborated supply chains (marketing, delivery, installation, after sales, etc) amongst all firms. Value addition declines as cost of sales increase to ensure protection of customers and personnel during pandemic.
S6 Business networks	S6V1	Networks	↓	→	↗	The role of the Tanzania Renewable Energy Association in the solar space is static in representating sector to GoT. Private sector players begin more active networking-platforming in response defining COVID-19 commercial impacts and support needed.
	S6V2	Partnerships	▽	→	↘	Partnerships consolidate within energy sector. Limited multi-sector partnerships are paused due to COVID-19.
S7 Warranties	S7V1	Warranties	→	↑	↑	All firms provide warranties backed with aftersales service tied to company consumer finance offerings. Unaltered due to COVID-19. However, at risk if wide degree of commercial firm failure occurs.
S8 Entrepreneurial skills	S8V1	Financial literacy	↘	↑	↑	Established firms display high capacity in finance and administration. No requests for capacity supports. Capacity unaltered during COVID-19.
	S8V2	Satisfaction level	↗	↗	↔	Healthy sense of competition amongst players. Increase cooperation to ensure overall market during COVID-19.
	S8V3	Marketing skills	→	↑	↓	Marketing is a central element to business model of all firms with dedicated full-time and part time personnel at central and field levels of firms operations. Marketing is largely suspended during COVID-19 unless agents are already village level based.
	S8V4	Advertising	→	→	↓	Advertising in specific market localities occurs if firms already have rural based sales personnel, but it is more focused to ensuring retention amongst standing credited customer base.
	S8V5	Production automatization	→	▪	▪	NA
	S8V6	Standardized production	→	▪	▪	NA
D1 Product diversity	D1V1	Diversity	↗	↗	↗	Domestic product offering stabilises with small solar home systems with preference TV option as norm. PU options begin to expand (productive lighting to pumping) and increased domestic PU appliance options. Present and planned offering unaltered due to COVID-19.
D2 Market penetration	D2V1	Market penetration	↘	↗	→	Growth in established markets to more remote and/or less developed areas paused during COVID-19 downturn. Standing customer base remains.
D3 Willingness to pay	D3V1	Willingness to pay	↘	→	↘	Solar products are known amongst consumers. Customer ability to repay is challenged depending on regional COVID-19 impact on wider economic market (tourism, export hubs, etc).
D4 Systems in use	D4V1	Usage rate	↑	↑	↑	Majority of products are tied to PAYGO modalities where in initial COVID retention repayment remains stable when COVID specific terms are adapted by firms.
	D4V2	Maintenance	↑	↑	↑	Users are aware of basic product operation and actively engage aftersales services for maintenance-repair support. Unaltered due to COVID-19.
D5 Replacement and repair	D5V1	Replacement rate	↗	↑	→	Customers rarely abandon solar once they have it. Tendency is increase system size for greater energy service-appliance options. Sustained demand remains unaltered due to COVID-19.
	D5V2	Repair rate	→	↑	→	Users are aware of basic product operation and actively engage aftersales services for maintenance-repair support. Unaltered due to COVID-19.
D6 Consumer awareness and perception	D6V1	Awareness	↔	→	→	Solar products are known amongst consumers and they are aware (generally) of other offerings. Increased reports of pricing satisfaction tied to level of service and/or quality of after sales. Unaltered due to COVID-19.
	D6V2	Perception	→	→	→	Customers rarely abandon solar once they have it. Tendency to increase system size for greater energy service-appliance options. However, specific awareness to inferior products is limited and consumers may acquire them if poor quality goods are available at lower prices. Unaltered due to COVID-19.
E1 Policy	E1V1	National plans	↓	→	→	National electrification reports beginning in 2017 prominently report solar access; however, national targeting is strictly focused on grid expansion. Planning unaltered due to COVID-19.
	E1V2	Policy	→	→	↘	Policies in solar and renewables as stated are not articulated in action. GoT focus to grid expansion ambitions. Unclear interpretations of Microfinance Act and National Tariff rate policies during COVID-19.
	E1V3	Product taxes	↓	→	→	Taxation rapdily expanded 2016-18 with negative effects. Some stabilization to the tax regime in 2019. COVID-19 relief to salary contributions limited benefit to commerical operations.
	E1V4	Business taxes	↘	→	→	All firms are formally registered and paying taxes. Unaltered due to COVID-19.
E2 Access to finance	E2V1	Subsidies	↘	↑	↓	RBF subsidies focus on vulnerable market segments in incentive valuation. RBF remains the only rapid response private sector finance option in the market and will phase out Q3.2020 despite high expression of extended need by private sector to COVID-19 recovery through 2021.
	E2V2	Financing options suppliers	↘	→	↓	Local financial institution offerings are limited to the only most established players and with unfavorable terms. WB finance to stimulate FI lending to solar companies is not uptaken. Lending environment as a whole on downturn due to COVID-19.
	E2V3	Financing options consumers	→	→	↓	Lending to consumers is private sector driven. Firms adapt PU payment modalities based on timing of agricultural returns vs fixed monthly instalment schedules. Increased costs of sales coupled with repayment unpredicatabiliy by consumers placing high risk on overall commercial operations of firms during COVID-19.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	→	→	→	Established firms observe international QA standards. However, uptake amongst local trade is rife with sub-standard goods. Unaltered due to COVID-19.
	E3V2	Enforcement	↓	→	↓	Solar Quality Standards enforcement by GoT is limited without continued lobbying of trade organizations and donors. Low priority of GOT during COVID-19.
E4 Market information	E4V1	Cost of information	↔	→	↑	Market information is provided by donor-driven programs at increased frequency for COVID-19 impacts to scaled, commerical sector. Program adapts scheduled consumer benchmark reports to reflect actual customer impacts of COVID-19.
	E4V2	Market facilitation organizations	↘	→	↗	The role of the Tanzania Renewable Energy Association in the solar space is static on behalf of private sector to maintain national relationships with GoT. Firms participate in coordination for internatial response and support to COVID-19 (GOGLA, SNV, USAID).
	E4V3	Awareness campaigns	↔	→	↗	Awareness campaigns for commerical firms limited to annual events. National Environment Day (Vice President's Office) and trade fairs continue as COVID-19 recovery action by GoT.
E5 Expertise development	E5V1	Courses	→	↔	→	Established firms develop and diversify employee training offerings. Institutionalised providers of Business Development Training are limited in country.
	E5V2	BDT	↔	↔	↓	Established firms develop and diversify employee training offerings. Institutionalised providers of technical training are limited in country. All training suspended due to COVID-19.
	E5V3	User training	→	→	→	User training is prominent in business model of firm as it has direct cost implications to cost of sales in PAYGO model operations. Provision variable across firms pending rural set up of operations during COVID-19.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Building upon a national platform with the government and TAREA to articulate realistic **enforcement of newly developed national ICS standard**; high potential to substantially expand scale of quality eligible products available in country. • Further support to **cooperation amongst private sector players** which had been already increased due to the impact of COVID-19 and the need for the rescue of the broader energy market. • Support to emerging **coordination platforms with GOGLA and Powering Africa** have the potential to steer strategic development of PU as post-COVID-19 necessity by ensuring greater economic resiliency of consumers. • Advice partners on **Microfinance Regulation Act** and consequences for PAYGO systems.
Supply side	• Increased focus to **scaling ICS product quality** relative to national standards and brand identity foreseen as pre-cursor to quantitative scaling (semi-industrial ICS producers) in post COVID-19 recovery phases. • Advanced timeline of the **RBF for PU** design phase scheduled for Q4.2020-Q1.2021 may be necessary to limit critical private sector financing gap due to the closure of RBF domestic solar in Q3.2020. • Design focus of the RBF for PU to **more stable incentive valuation** to limit impacts and uncertainty in the planning horizons of firms caused by COVID-19. • Increased emphasis to **decentralized PU product orientations** foreseen due to ongoing uncertainty in tariff rating regulations for small power producers.
Demand side	• Higher emphasis on **BCC interventions using media** (print/radio/television) to overcome delays caused by COVID-19 and related impacts. • Integration of COVID-19 consumer impacts in the **design of the PU component** as of Q4.2020 with emphasis to better alignment PAYGO schedules to small holder agricultural cash flow dynamics.

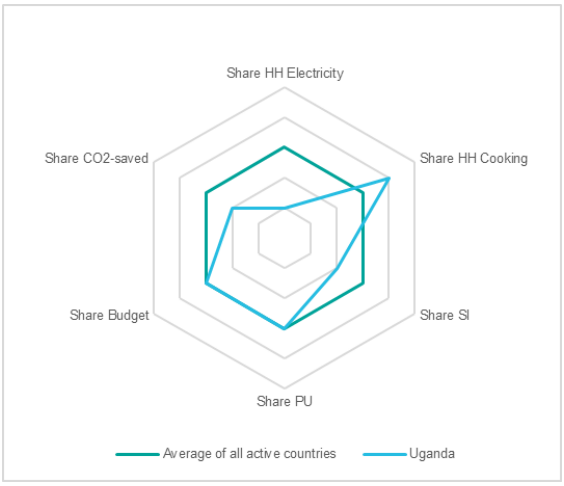
Uganda

Section 1: Key facts

Country facts	
Population	44.3 million
HDI	159 ↑ | Total (0.53)
UN Classification	LDC / LLDC
Access clean cooking	< 5 %
Access electricity	58 % urban 38% rural

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
Implementer	GIZ
Technologies	

Relevance within the EnDev Portfolio



Section 2: Strategic Alignment

Alignment with EnDev's new strategy	
Relevance	• EnDev UG plays a **crucial role achieving national energy access targets** formulated in Ugandan Energy Policy, Joint Sector Review, National Development Plan and NDC for the cookstove and solar sector in line with SEforAll and SDG7 targets. • **High impact** of EnDev Uganda: 148,027 people reached for electricity & 1,137,024 for cooking energy since inception. • Successful pioneer role in scaling up ICS and **energy access measures in refugee settings** in the frame of the Global Compact on Refugees (GCR) through which access to energy solutions to refugee-host communities are promoted.
Contribution to paradigm shift	• Sector development through support to **professionalization of solar and cookstove companies** in the transition towards significantly higher sales, consortia approaches, higher-tier quality products for households, PU and SI (applying targeted business development support & coaching and innovative incentive tools like RBF). • Promotion of **innovative technologies and business models** including semi-industrial production, electric cooking, use of alternative fuels, establishment of a (solar) PU competence cluster as well as stove testing facilities. • Supporting growth in the solar sector by introducing **innovative insurance models for PAYGO customers** and exploring options of linking solar companies to the national credit reference bureau to improve credit management and reduce portfolio at risk in the solar sector. • Scaling up of energy markets in refugee-host communities through **mainstreaming refugees' energy needs in national policies and strategies** and through innovative approaches for sustainable access to energy services and products for households and PU like energy kiosks, RBF support, promotion of electrification and clean cooking in SI.
Important collaborations for scaling up	**Funding and investment** • Scaling up activities for PU activities in agricultural value chains planned in the frame of the forthcoming, new project ***Sustainable Energy for Smallholder Farmers*** funded by the IKEA Foundation for the period 2021-2023 covering Uganda, Kenya and Ethiopia (8 million Euro). • Exchanges with the **World Bank** in the preparatory stages of the new large-scale *Energy Access Scale-Up Project* (EASP) including a strategic input into a biomass PU market assessment to identify scale-up potential of EnDev approaches.

	Implementation • Implementation of the USAID financed **Smart Communities Coalition Innovation Fund (SCCIF)** supporting innovations to increase energy, connectivity and digital tools in refugee settlements with high scale-up potential. • Implementation of the **USAID-funded innovative last-mile RBF** targeting hard to reach PAYGO solar customers (LNOB) together with the Private Sector Foundation Uganda (PSFU), a pilot with high scaling potential.
	Knowledge sharing and learning • Active participation in the humanitarian **Working Group Environment and Energy** (WorkGrEEn) and contribution to the elaboration of the "*Sustainable Energy Refugee Response Plan*" led by the Office of the Prime Minister and supported by UNHCR. • Know how inputs to the elaboration of a **national solar PAYGO regulation** as Uganda is a PAYGO Toolkit Pilot country. • Collaboration with SNV Uganda for the conceptualization of a **joint approach for PU in agricultural value chains**. • Knowledge sharing with **Ethiopia and Kenya** in the frame of the new project *Sustainable Energy for Smallholder Farmers* funded by the IKEA Foundation. • Close partnership and exchange with national, regional and **international technical institutions and sector associations** like the Uganda Solar Energy Association (USEA) and the Uganda National Alliance on Clean Cooking (UNACC).
Gender	• A **Gender Action Plan** will be developed together with ENERGIA/HIVOS to strengthen gender mainstreaming and transformation in line with the Global Gender Guidance for EnDev programming.

Consideration of ITAC recommendation

Awareness/behavior change for clean cooking: Marketing & promotional support activities will be included to supplement RBF implementation.

Sustainability of solar market-building for SI: ITAC comments will be taken up, although initial successful pilot solar activities in Uganda serve as proof of concept.

Stronger consideration of O&M: A limited impact study with schools electrified under the RBF partnerships will further inform EnDev's approach and potential adjustments for improved O&M.

PU approach: Approach was defined based on a detailed concept note and related feedback regarding appliance quality, consumer finance & synergies with agriculture.

PU finance: RBF partners are encouraged to explore and pilot options for PU consumer financing (e.g. installments, PAYGO, Micro-Finance Institutions); EnDev actively takes up the topic through the

PU Competence Cluster to be established in cooperation with the Ugandan Solar Energy Association (USEA).

Electric waste: Topic of electric waste has been integrated as a selection criterion in tender assessments for all solar RBFs.

Target groups for SI activities: Strong need (and market potential) for solar electrification of primary schools remaining; the revised target group also includes secondary schools.

Involvement of refugee-host communities and related financial incentives: Host communities are an integral part of the EnDev approach in Uganda with the objective to share benefits by 50/50 between refugee and host communities; a RBF approach for the sale/distribution of solar products & cookstoves with incentives for companies branching out to refugee-host communities will be piloted.

Gender: Suggestions will be considered in the Gender Action Plan to be developed.

Ownership & exit strategy: Increased collaboration with the national government (MEMD) and support to sector associations and private sector; exit strategy not yet developed as EnDev Uganda is shifting focus to areas where support is still indispensable (e.g. PU).

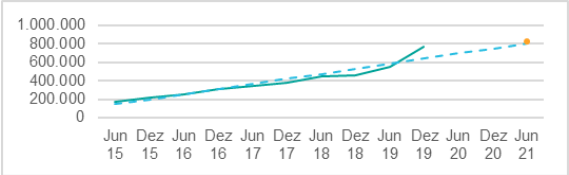
Quality of response to ITAC recommendations (on a scala from low-medium-high): **medium**

Section 3: Performance

Effectiveness

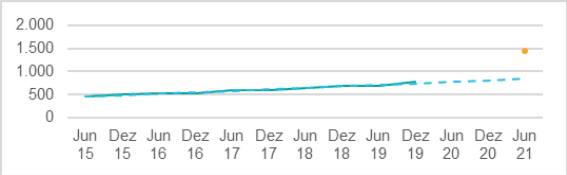
HH Access Cooking

Targets: 825,000 Achieved: 767,491



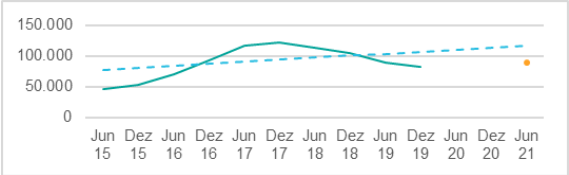
SI Access

Targets: 1,450 Achieved: 788



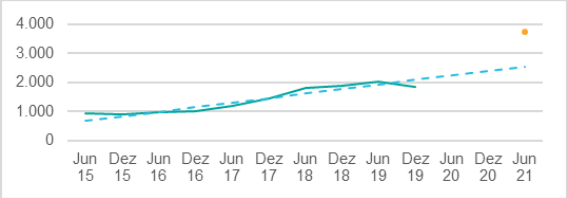
HH Access Electricity

Targets: 90,000 Achieved: 83,441



PU Access

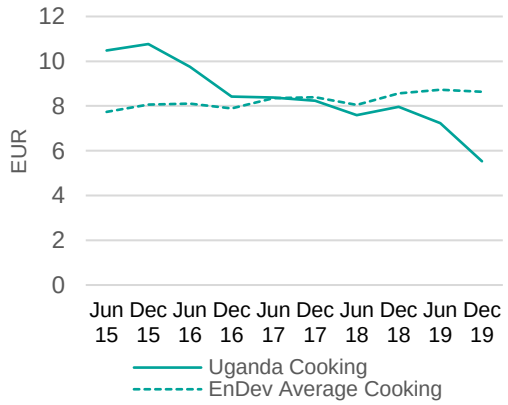
Targets: 3,750 Achieved: 1,875

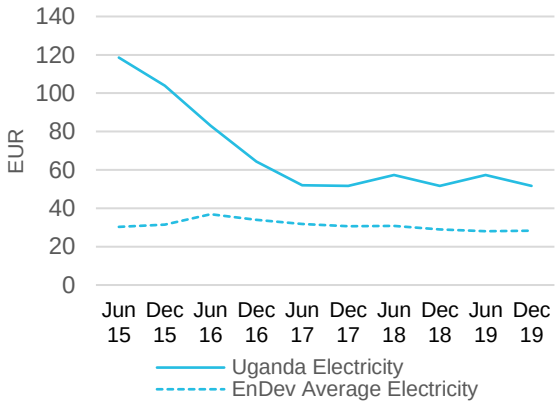


Additional info

- Recent increase in **HH Cooking Access** resulting from successful RBF partnerships and cookstove sales in refugee settlements.
- Drop in **HH Electricity Access** due to transition from picoPV to SHS & replacements from earlier years; raising SHS access results expected from new last-mile RBF; note: not included in the above figures are 48,750 people connected to grid electricity through the Regional Grid Densification Challenge RBF implemented with the Rural Electrification Agency (REA).
- **SI access**: Substantial increase expected with new RBF partnerships launched mid-2020.
- **PU access**: Substantial increase expected through new activities in solar & cookstove sector, i.e. new RBF in both sectors including PU to be launched in Q3 2020, and through new PU competence cluster to be set up with the sector association USEA; additional PU access through the new project “Sustainable Energy for Smallholder Farmers”.

Efficiency





Additional info

- **Cooking efficiency**: Successful RBF partnerships for ICS and scaling up of cookstove sales in refugee settings caused a dramatic increase of efficiency in the cooking sector.
- **Electricity efficiency**: An initial improvement in cost efficiency in the electricity sector (Jun 15 – Jun 17) was achieved through the shift to picoPV and SHS. Given the current focus on higher tier, more expensive SHS for PU & SI, we expect the cost efficiency to remain slightly above EnDev average. This is largely based on the lack maturity in the market limiting economies of scale.

Section 4: Potential

Assessment of (sub-)sector and/or market development

General energy market characteristics in Uganda

Mainly lower-tier household products are offered in and around trading centers. Significant limitations for PU, SI and households exist in rural, hard to reach areas. Companies are often artisanal (cookstoves) and financially fragile (solar) with limited professionalization and economies of scale. There is a prevalence of low-quality products negatively impacting on customer perception and trust; reasons vary from lack of professionalization and production capacity to lacking quality standard enforcement.

Electricity sector

Markets for tier-1 to -2 SHS supplied to HH, SIs and micro-, small- and medium enterprises, including small-scale appliances are mainly in expansion phase with specific variables in the piloting or maturity phase. There is a need for further professionalization of companies and significant improvement of business models / operations especially for PAYGO companies. As well there is a need to further increase sales, spatial reach, networks and partnerships, marketing and awareness. The standard solar product HH market is relatively well developed, but there is still low market share in the areas of PU and SI as well as for last-mile households.

Cooking sector

The sector is largely in the expansion phase with specific variables in piloting or maturity phase. There is still high demand for ICS. Markets provide mainly semi-industrialized/SME-produced HH stoves including few PU models. Companies have still a significant need for professionalization regarding business operations, production capacity, formalization, quality and standards and growth.

Electricity and clean cooking in refugee context

In the refugee context markets for picoPV, SHS (tier-1 & -2) for HH, SI & SMEs and ICS are mainly in the pre-commercial and pioneering phase. There is a high market development potential but also substantial challenges: lack of energy suppliers, weak business skills, low financial inclusion, (perceived) unstable business environment due to (potential) mobility of refugees within Uganda and returning to home countries, low awareness for benefits of quality energy products, market distortions due to in-kind distribution.

COVID-19 Impact

The pandemic is causing ssignificant impacts especially on sales, repayment behavior (SHS), production (ICS), distribution networks in both, the ICS and the solar market; companies struggle to keep personnel, sell products and survive. Significant support is needed to rescue companies and return markets to pre-COVID-19 conditions.

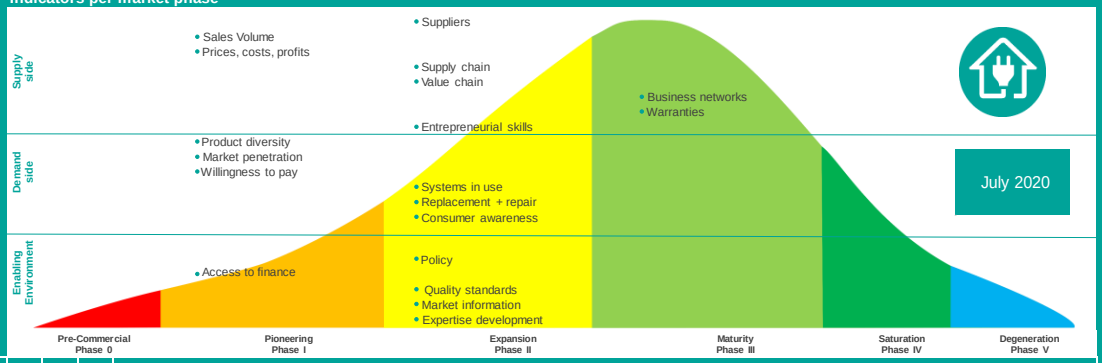
Summary EnDev Market Scorecard: Uganda July 2020 Solar Home Systems

Market: Technology: Includes SHS (tier 1 & tier 2) for households as well as productive use (in combination with small scale appliances like tvs, hair cutters etc.) and social institutions
Geographic focus: Entire Ugandan market excluding refugee settlements & host communities

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators	Variables		2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	▽	↗	↘	Currently no change, but expected reduction in number of businesses
	S1V2	Business modalities	↗	↗	↗	No change: Different business models in place
	S1V3	Formality	↑	→	→	No change: Formal registration is needed for URA clearance, widely adopted
	S1V4	Jobs created	↗	↔	↔	First feedback of companies show expected staff reduction, loss in number of active agents
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↘	Massive reduction in sales reported
	S2V2	Inventory turnover	↗	↗	↘	Massive reduction in sales and therefore inventory turnover reported
S3 Prices, costs and profits	S3V1	Prices	→	↗	↗	No change: First signs of price competition to increase market share but still strong impact of subisidies or similar support, Competition more based on distribution reach, product quality etc.
	S3V2	Costs	↔	↗	↗	No change: First company failures point towards the still high per unit cost of a significant share of companies, oftentimes subsidized by donors
	S3V3	Profit margin	→	↑	↑	No change: Profitability remains difficult to assess, but assumed low for many companies
	S3V4	Investments	↔	↗	↗	Companies focused on holding on to existing levels, investment or expansion plans halted unless donor funded
S4 Supply chain and after-sales service	S4V1	Length	↔	↗	↗	No change: First pilots of splitting up supply chains (for example BrightLife & Finca for consumer finance) did not take off significantly, remaining players still seem to focus on short supply chains
	S4V2	Distribution channels	↗	↗	↘	Existing network of sales agents might not be the same after months of reduced sales
	S4V3	Spatial reach	↗	→	→	No change: majority of companies operates in multiple regions.
	S4V4	Initial suppliers	↗	↗	▪	No change
	S4V5	After-sales service	↑	↗	↗	No change: differences between rural and urban
S5 Value chain	S5V1	Value added	→	↗	↗	No change: for some players value added is increasing
S6 Business networks	S6V1	Networks	↗	↘	↘	No change: USEA's presence and reach is well established, although service offers are still limited which could limit synergy opportunities
	S6V2	Partnerships	↗	↗	↗	No change: example Fenix + MTN; RBF cosortia approaches
S7 Warranties	S7V1	Warranties	↗	↗	↗	No change: Suppliers of quality products provide warranties, but other unregistered players still do not, which we have decided not consider based on the market phase descriptions given.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	↔	↔	No change: Strong difference between larger and smaller companies, detailed BDS needs assessment planned.
	S8V2	Satisfaction level	→	↗	↗	No change: Some level of uncertainty even before COVID specifically on the sustainability of the PAYG model (example Solantis), URA problems.
	S8V3	Marketing skills	↗	↑	↑	No change: Visible in marketing plans in RBFs
	S8V4	Advertising	↗	↗	↗	No change
	S8V5	Production automatization	↗	▪	▪	No change
	S8V6	Standardized production	↗	▪	▪	No change
D1 Product diversity	D1V1	Diversity	↗	↗	↗	No change
D2 Market penetration	D2V1	Market penetration	↗	↗	→	No change
D3 Willingness to pay	D3V1	Willingness to pay	↗	↗	↘	60Decibel study shows strong decline in overall ability to pay which will also have an impact on willigness.
D4 Systems in use	D4V1	Usage rate	↑	↑	→	No change
	D4V2	Maintenance	→	→	→	No change
D5 Replacement and repair	D5V1	Replacement rate	↑	▽	↘	Available income for replacements is decreasing
	D5V2	Repair rate	↗	↗	↘	Available income for repairs is decreasing
D6 Consumer awareness and perception	D6V1	Awareness	↗	↗	↗	No change
	D6V2	Perception	→	↗	↗	No change: Ability for consumers to identify bad quality products still very limited (lack of quality enforcement)
E1 Policy	E1V1	National plans	↑	↑	↑	No change: National Energy policy, National Electrification Strategy
	E1V2	Policy	↗	↗	↗	No change
	E1V3	Product taxes	↔	↗	↗	No change
	E1V4	Business taxes	↗	↗	↗	No change
E2 Access to finance	E2V1	Subsidies	↗	↑	↑	No change: Remain relevant, but no longer openly shared as subsidies and more targeted at poor/rural areas.
	E2V2	Financing options suppliers	↔	↗	↔	Additional funds coming in, but local investors/banks will struggle to cope with economic impact which could reduce the availability of funds. Also, incoming funds do many times not fit the needs of the solar companies.
	E2V3	Financing options consumers	↗	↔	↔	No change
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	↗	↗	No change
	E3V2	Enforcement	↗	↗	↗	No change
E4 Market information	E4V1	Cost of information	↗	↗	↗	No change
	E4V2	Market facilitation organizations	→	↑	↑	No change: USEA is gaining importance and capabilities to support companies.
	E4V3	Awareness campaigns	→	↗	↗	No change
E5 Expertise development	E5V1	Courses	↗	↗	↑	Additional online offers
	E5V2	BDT	↗	↗	↑	Additional online offers
	E5V3	User training	↗	↗	↓	Even harder for companies to support as transportation is more expansive or in some places even impossible because of COVID-19 restrictions

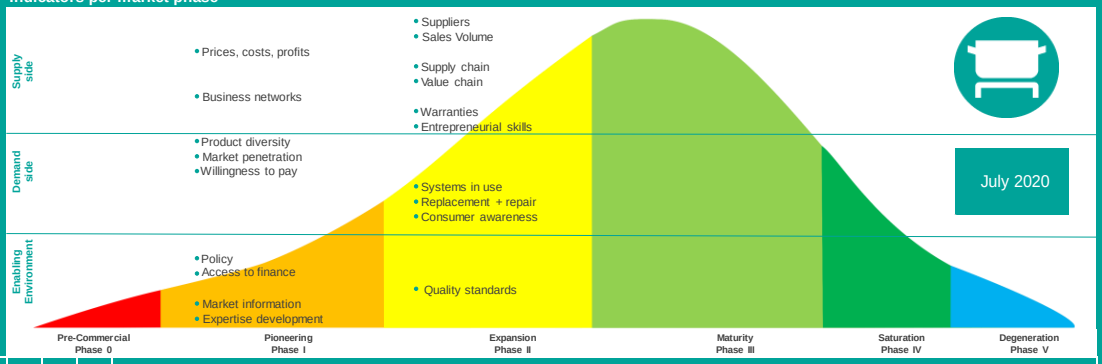
Summary EnDev Market Scorecard: Uganda July 2020 Improved cookstoves

Market: This market is focused on the producers, distributors and vendors of largely semi-industrialized (factory) and SME improved cookstove businesses and consumers who make up the largest share of the cookstove market in Uganda. EnDev has shifted support approach in the new project phase to focus on results-based and market based approaches for ICS (HH + PuE) access interventions implemented by private sector partners for increasing distribution outreach, and in close collaboration with the Ministry of Energy and Mineral Development as the political partner.

Market trends

Positive ↑
Slight positive ↗
Stagnation →
Slight negative ↘
Negative ↓
Conflicting ↔
Unknown ▽
Not measured ▯
Doesn't apply ▪

Indicators per market phase



Indicators	Variables		2018	Dec 2019	July 2020	Explanation
S1 Suppliers	S1V1	Businesses	▽	↑	↓	Market poised for continued growth in 2020 as available ICS market demand still high. COVID-19 had significant impacts due to strict lockdown measures (no non-essential movement for 2+ months) halting almost all ICS production, sales & distribution activities. Companies without sufficient capital to retain staff/build stock/implement SOPs likely to close without support.
	S1V2	Business modalities	↗	↗	↘	Opportunities/investment towards BDS from various sector & non-sector players was increasing at start of 2020, SMEs supported peers to formalize. COVID-19 likely exposed those who did not have adequate operational guidelines in place to be able to quickly adapt and implement SOPs, trigger redirection of cash flows/profit margins to fill gaps and meet challenges created by COVID-19.
	S1V3	Formality	↗	↑	→	Degree of formality unlikely to have changed from Dec 2019 despite COVID-19 impacts however, challenges from having informal structures for business operations have been compounded due to COVID-19 impacts
	S1V4	Jobs created	↗	↑	↓	COVID-19 impacts and corresponding lockdown measures meant little to no production/sales/distribution activities could be carried out for some months. Businesses had to lay off staff, or reduce salaries, or not pay staff leading to a likely significant loss of human resources across the value chain.
S2 Sales Volume	S2V1	Products / services sold	↗	↑	↓	Given that COVID-19 related impacts and lockdown restrictions took effect in Uganda in mid - late March 2020, production + sales + distribution activities were heavily impacted as most businesses could no longer operate, or had to with very limited capacity (usually only at production facility with few/no field activities possible) - See EnDev COVID report
	S2V2	Inventory turnover	↗	↗	↓	See EnDev COVID report
S3 Prices, costs and profits	S3V1	Prices	→	↗	↘	Few businesses (with sufficient staff and/or capital) were able to refocus business efforts towards remote consumer engagement with existing users for check ups/referrals for potential new clients. Majority ceased operations during the COVID-19 lockdown period. (See EnDev COVID report)
	S3V2	Costs	↗	↑	↘	Cost of production decreasing slightly due to increasing economies of scale (mainly in the household cookstove segment), increased production capacity due to increased demand at start of 2020. COVID-19 impacts have increased cost of doing business (more expensive to source raw materials, transport and receive and use them with SOPs in place, no field activities possible during lockdown, etc.)
	S3V3	Profit margin	→	↗	↓	Economies of scale for production were increasing pre-2020, profit margin on stoves still relatively low (higher for PuE stoves). Cost of distribution, marketing, and re-investing in business development service areas were still high. COVID-19 restrictions halted all stove operations and businesses were forced to prioritize staff retention, SOPs, remote consumer engagement etc.
	S3V4	Investments	↗	↗	↘	See EnDev COVID report
S4 Supply chain and after-sales service	S4V1	Length	↗	↑	↓	Given that COVID-19 related impacts and lockdown restrictions took effect in Uganda in mid - late March 2020, production + sales + distribution activities were heavily impacted as most businesses could no longer operate, or had to with very limited capacity (usually only at production facility with few/no field activities possible)
	S4V2	Distribution channels	↗	↗	→	COVID-related restrictions made it impossible to improve on distribution channels.
	S4V3	Spatial reach	↗	↗	↓	Movement restrictions hindered companies to make use of their spatial outreach potential.
	S4V4	Initial suppliers	↗	↗	↓	Given that COVID-19 related impacts and lockdown restrictions took effect in Uganda in mid - late March 2020, production + sales + distribution activities were heavily impacted as most businesses could no longer operate, or had to with very limited capacity (usually only at production facility with few/no field activities possible)
	S4V5	After-sales service	↑	↑	↓	Due to COVID-19 related restrictions, companies struggled to implement after-sales services.
S5 Value chain	S5V1	Value added	↗	↗	↘	Linkages and frameworks between value chain actors e.g. producer, distributor, vendor, sales agent, end user were improving however challenges with upscaling operations across multiple regions/segments evident and compounded with COVID-19 movement and lockdown restrictions.
S6 Business networks	S6V1	Networks	↗	↗	→	Numerous (but fragmented) networks available in the cookstove sector which following the onset of COVID-19 made it even more difficult to have coordinated efforts to support/inform stove businesses as field and partner visits were restricted.
	S6V2	Partnerships	↗	↑	→	Hardly any new partnerships to be expected due to restricted movement options and little economic activities.
S7 Warranties	S7V1	Warranties	↗	↑	↘	Due to COVID-19 related restrictions, companies struggled to implement warranty related acitivities.
S8 Entrepreneurial skills	S8V1	Financial literacy	→	↗	→	Due to COVID-19 financial literacy could not further be improved.
	S8V2	Satisfaction level	↗	↑	↘	Current developments put company survival at risk
	S8V3	Marketing skills	↗	↑	→	Due to COVID-19 marketing skills could not further be improved.
	S8V4	Advertising	↗	↑	→	With production + distribution + sales activities halted due to COVID-19 lockdown measures, businesses that had sufficient working capital to shift focus to remote customer and partner engagement did so e.g. to generate referral sales, while majority could not afford to do so. Others had to halt their advertising activities.
	S8V5	Production automatization	▯	↗	→	Production automatization and optimisation could not be advanced during COVID-19 related lock-down.
	S8V6	Standardized production	↗	↗	→	Production standardisation could not be advanced during COVID-19 related lock-down.
D1 Product diversity	D1V1	Diversity	↑	↑	→	COVID-19 impacts and lockdown restrictions took effect in Uganda in mid - late March 2020, production + sales + distribution activities were heavily impacted as most businesses could no longer operate, or had to with very limited capacity (usually only at production facility if could afford SOPs on-site addition with few/no field activities possible) - limits access to market for new businesses.
D2 Market penetration	D2V1	Market penetration	↗	↑	→	With production + distribution + sales activities halted due to COVID-19 lockdown measures, businesses that had sufficient working capital to shift focus to remote customer and partner engagement did so e.g. to generate referral sales, while majority could not afford to do so.
D3 Willingness to pay	D3V1	Willingness to pay	↗	↗	↓	Household consumer expenditure shifted due to the COVID-19 lockdown measures to either SOPs, COVID prevention, and basic needs e.g. food. Low priority to pay for improved cookstoves following onset of COVID.
D4 Systems in use	D4V1	Usage rate	→	↑	↑	no change
	D4V2	Maintenance	↗	↗	↓	With activities halted due to COVID-19 lockdown measures, businesses that had sufficient working capital to shift focus to remote customer and partner engagement did so e.g. by providing remote maintenance services. Other companies were not able to do so.
D5 Replacement and repair	D5V1	Replacement rate	↑	↑	↓	Household consumer expenditure shifted due to the COVID-19 lockdown measures to either SOPs, COVID prevention, and basic needs e.g. food. Low priority to buy improved cookstoves following onset of COVID-19.
	D5V2	Repair rate	↗	↗	↓	With production + distribution + sales activities halted due to COVID-19 lockdown measures, businesses that had sufficient working capital to shift focus to remote customer and partner engagement did so e.g. to generate referral sales, provide remote maintenance/training guidance, while majority could not afford to do so.
D6 Consumer awareness and perception	D6V1	Awareness	↗	↑	↑	no change
	D6V2	Perception	↗	↗	↗	no change
E1 Policy	E1V1	National plans	→	↗	↗	NDP III approved by GoU Cabinet in mid 2020 and revised to reflect COVID-19 related impact
	E1V2	Policy	↗	↗	↗	On-going MEMD review of Energy Policy and other key policy documents despite COVID-19 restrictions e.g. NDP III, Sector Development Plan II all with targets and indicators planned for
	E1V3	Product taxes	→	↗	↗	On-going MEMD review of Energy Policy and other key policy documents despite COVID-19 restrictions e.g. NDP III, Sector Development Plan II all with targets and indicators planned for
	E1V4	Business taxes	→	↗	→	Payment of taxes was not increased, rather haltet due to COVID-19 related financial challenges in cook stove companies.
E2 Access to finance	E2V1	Subsidies	↗	↑	↓	Household consumer expenditure priorities shifted due to the COVID-19 lockdown measures to either SOPs, COVID-19 prevention, and basic needs e.g. food. Low priority to buy improved cookstoves following onset of COVID-19. Disruption of production and sales activities may require partial subsidies to build stock, generate demand, offer sales discounts, etc.
	E2V2	Financing options suppliers	↗	↗	→	Limited access to flexible forms of financing for debt equity or working capital, mostly access to other loan financing options from banks. Businesses still heavily rely on donor/project driven financial and other support measures. No significant change in terms of adecuate and targeted financing options.
	E2V3	Financing options consumers	↗	↑	→	Hardly any targeted consumer finance measures due to COVID-19 response available
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↑	↑	↗	Collaboration with key sector players on National Action Plan on cookstove standard implementation on-going despite COVID-19 challenges
	E3V2	Enforcement	↗	↗	↗	no change
E4 Market information	E4V1	Cost of information	↗	↗	↗	Increased information sharing from donors and peer-to-peer exchanges due to unprecedented COVID-19 impacts and restrictions at national, regional and global level (see COVID surveys e.g. EnDev, GDC, CCA, etc.)
	E4V2	Market facilitation organizations	▯	↗	→	On-going Energy Review process, NDP III and other sector plans, have market facilitation aspects planned for, but no real move forward can be noticed currently.
	E4V3	Awareness campaigns	↗	↑	→	COVID-19 restrictions limited progress on awareness activites due to movement restrictions
E5 Expertise development	E5V1	Courses	→	↗	↗	While on-site trainings are currently not available, the number of online trainings and knowledge on these increases.
	E5V2	BDT	→	↗	↗	no change, but more thinking taking place about virtual BDTs
	E5V3	User training	↗	↗	→	COVID-19 restrictions limited progress on user training activities due to movement restrictions

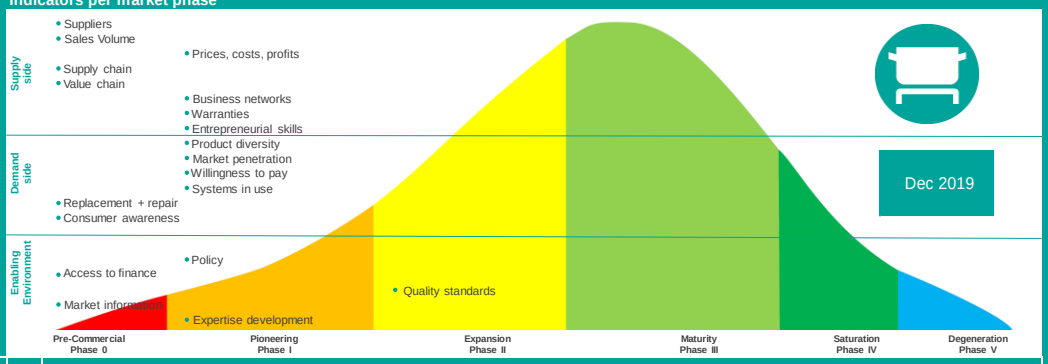
Summary EnDev Market Scorecard: Uganda Dec 2019 Improved Cookstoves

Market: Refugee Cooking

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators	Variables		Dec 2019	Explanation
S1 Suppliers	S1V1	Businesses	↗	In refugee settlements, the markets do usually not provide improved cook stoves. Only very basic inefficient charcoal stoves are offered, while people mainly use 3-stone-fires.
	S1V2	Business modalities	↗	Local business activities are usually introduced by donors/NGOs. These might include artisanal production of stoves, establishment of energy kiosks and similar.
	S1V3	Formality	↗	Local business activities in the stove sector are informal. Some bigger companies in few locations start selling their products to refugee households in settlements.
	S1V4	Jobs created	↗	There are basically no full-time jobs created in the cook stove sector in settlements. However, donors and few companies create income generation opportunities for artisans or kiosk management teams.
S2 Sales Volume	S2V1	Products / services sold	↗	Sales volumes are still very low with few exceptions of donor led pilots for subsidized products.
	S2V2	Inventory turnover	↗	Due to the low sales numbers, the inventory turnover related to sales in refugee settlements is very low.
S3 Prices, costs and profits	S3V1	Prices	→	In many cases, prices are subsidized through donor interventions or promotion activities of companies. This is due to the very low ATP and WTP. Humanitarian stakeholders sometimes provide stoves for free.
	S3V2	Costs	→	In Uganda in general, costs per unit for quality stoves are high due to raw material costs, i.e. metal. In refugee settings, stoves many times are subsidized.
	S3V3	Profit margin	→	In Uganda in general, profit margins for ICS are extremely low. This is exacerbated in refugee settings where logistics, transport etc. add to the companies' costs.
	S3V4	Investments	↗	Companies start considering refugee markets as potential areas of investment. However, these need support from donors to start venturing into these markets.
S4 Supply chain and after-sales service	S4V1	Length	→	The supply chains are mostly short. Producers/distributers sell to the customers directly or via energy kiosks. Stove companies have not yet established sales hubs and sales forces in settlements.
	S4V2	Distribution channels	↗	Distributions channels are usually pilot activities and supported by donors.
	S4V3	Spatial reach	↗	As of today, there is no wider coverage of sales activities in refugee settlements. Companies do not target all potential customers comprehensively.
	S4V4	Initial suppliers	→	There is no clearly established service industry available in refugee settlements.
	S4V5	After-sales service	→	There are no professional service providers for after-sales-services available.
S5 Value chain	S5V1	Value added	→	Within refugee settlements hardly any value addition is happening. Except for on-site production of artisanal stoves.
S6 Business networks	S6V1	Networks	↗	In Uganda, two cook stove related associations exist: Uganda Alliance on Clean Cooking, Biomass Energy (UNACC), Biomass Energy Efficiency Technologies Association (BEETA). Additionally there is Uganda National Renewable Energy and Energy Efficiency Alliance (UNREEEA). However, coordination and sector representation for cook stoves companies is still weak.
	S6V2	Partnerships	↗	Within refugee settlements, partnerships are still hard to find. However, donor activities, e.g. those from EnDev incentivise partnerships between producers and distributors.
S7 Warranties	S7V1	Warranties	→	Warranties are probably only offered by donor supported company piloting.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	Financial literacy is low, but VSLAs and other livelihood activities as well as NGOs address this issue among refugees of which some are also aritsanal stove producers.
	S8V2	Satisfaction level	→	For market-based sales of stoves the level of satisfaction must be ambivalent or critical, because on the one hand ATP and WTP are low and on the other hand in-kind distribution and subsidies are still happening. Purchasing of artisan-made lorena stoves have been reported as satisfactory.
	S8V3	Marketing skills	↗	Local stove artisans have very little marketing skills, whereas bigger stove manufacturers have more knowledge.
	S8V4	Advertising	→	Local stove artisans have no advertising skills, whereas bigger stove manufacturers have more knowledge, but do not really apply in refugee settlements.
	S8V5	Production automatization	↗	Artisanal production within settlements has no division of labor. However, companies that sell or have the potential to sell are on a higher level of optimisation.
	S8V6	Standardized production	↗	Artisanal production within settlements is not perfectly standardized despite efforts to introduce this. Some companies that sell or have the potential to sell adhere to at least a minimum level of standardisation and are guided by the new biomass stove standard which at some point will become mandatory.
D1 Product diversity	D1V1	Diversity	↗	The local markets still offer only very basic not improved stoves, but humanitarian and development partners support activities that introduce a wider range of higher quality stoves.
D2 Market penetration	D2V1	Market penetration	→	The percentage of people using ICS is stagnating due to low penetration of ICS and rising numbers of refugees
D3 Willingness to pay	D3V1	Willingness to pay	→	There is a low willingness to pay market prices for ICS, especially due to very low ATP and experiences with in-kind distribution. This scenario appears to change as income oportunities are higher in refugee population that have stayed longer. There might be further change due due rising pressure on natural ressources and increasing tensions with host communities.
D4 Systems in use	D4V1	Usage rate	↗	Usage rate is low, because in-kind distribution of stoves does usually not consider consumer preferences at the point of choice of the ICS to be distributed. However, where market-based approaches are implemented a relatively high usage rate can be assumed
	D4V2	Maintenance	→	Where donors are involved, user training is incentiviced.
D5 Replacement and repair	D5V1	Replacement rate	→	Low replacements for high value products that were generally given free of charge. But most stoves especially semi-industrial ones that were bought by users are often replaced or even a second is being acquired if performance and efficiency of the first stove are appreciated.
	D5V2	Repair rate	↗	Mainly artisan stoves are repaired by trained stove builders within settlements. The semi-industrial and industrial stoves are not repaired.
D6 Consumer awareness and perception	D6V1	Awareness	↗	Not many consumes are knowledgeable about benefits of ICS. However, the number of consumers with some awareness of the technology and benefits is rising as humanitarian and development stakeholders increase activities to fill the knowledge gap.
	D6V2	Perception	↗	Refugees and hosts that have understood the benefits do appreciate and preceive the technologies as beneficial.
E1 Policy	E1V1	National plans	→	The responsibility to plan the refugee response has been with UNHCR, they have developed targets for refugees' energy access in the national Refugee Response Plan. These targets respond to SDG7.
	E1V2	Policy	↑	The task force for the development of the Sustainable Energy Refugee Response Plan related to CRRF is established and first ideas for the content of the Plan developed.
	E1V3	Product taxes	→	There is no special tax relief in place for stoves.
	E1V4	Business taxes	↗	Local tax regimes apply for businesses in the settlements and are usually determined by local authorites. Compliance is high.
E2 Access to finance	E2V1	Subsidies	↑	Most stoves that are currently in use have been distributed for free. However, efforts are increasing to introduce market-absed approaches with some or no subsidies.
	E2V2	Financing options suppliers	→	Limited access to flexible forms of financing for debt equity or working capital, mostly access to other loan financing options from banks. Businesses still heavily rely on donor/project driven financial and other support measures. COVID impact on funding priorities and lack of cash flow generation from sales impacting loan repayments
	E2V3	Financing options consumers	→	For stoves, hardly any substantial financing mechanisms exists.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	Biomass stove standards have been developed. Implementation is still voluntary, but will become compulsory at some point.
	E3V2	Enforcement	↗	The respective institution UNBS is discussing ways how to make the standard mandaroty and subsequently how to enforce.
E4 Market information	E4V1	Cost of information	↗	Market information on the cooking situation in refugee settlements is provided by donors and humanitarian stakeholders and the topic is getting more and more attention.
	E4V2	Market facilitation organizations	↗	In refugee settlements, there are no specific market facilitation organizations except for some few development partner activities.
	E4V3	Awareness campaigns	→	Currently there are no big awareness campaigns
E5 Expertise development	E5V1	Courses	↗	For refugees, there are no standard technology trainings available. However, donors and humanitarian partners increasingly see the need for these to be implemented.
	E5V2	BDT	↗	
	E5V3	User training	→	Limited options exist for user training by producers or dealers.

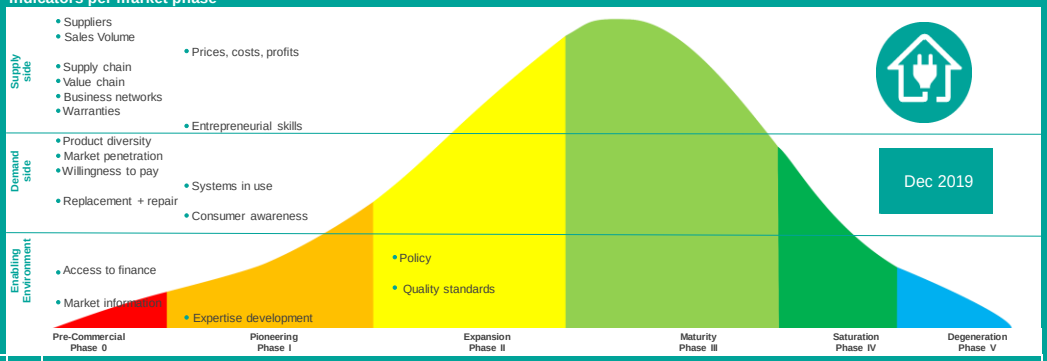
Summary EnDev Market Scorecard: Uganda Dec 2019 Solar Products

Market: Refugee Solar
Technology: Includes picoPV and SHS (tier 1 & tier 2) mostly for households and social institutions
Geographic focus: refugee settlements & host communities

Market trends

Positive	↑
Slight positive	↗
Stagnation	→
Slight negative	↘
Negative	↓
Conflicting	↔
Unknown	▽
Not measured	▯
Doesn't apply	▪

Indicators per market phase



Indicators		Variables	Dec 2019	Explanation
S1 Suppliers	S1V1	Businesses	↗	Refugee settlements have been seen as hard to reach areas, generally dealerships do not set up hubs and outlets there. Private sector does partly not know about requirements how to get permission to operate there. Current efforts are mainly through pilot energy kiosks and first attempts of private sector companies with special funding.
	S1V2	Business modalities	↗	Local business activities are usually introduced by donors. These include establishment of energy kiosks and vendor outlets.
	S1V3	Formality	↗	Local business activities for solar solutions are driven by informal actors. Few cases of larger dealers selling on mobile vans and as promotional or activation activities. These usually adhere to formal registration for URA clearance.
	S1V4	Jobs created	↗	There are basically no full-time jobs created in the solar business in settlements. However, donors and few companies create income generation opportunities for small scale vendors or kiosk management teams.
S2 Sales Volume	S2V1	Products / services sold	↗	Sales volumes are still very low with few exceptions of donor led pilots for subsidized products. Solar services such as phone charging are increasing.
	S2V2	Inventory turnover	↗	Due to the low sales numbers, the inventory turnover related to sales in refugee settlements is very low. Source information is also lacking as most small traders do not keep records of sales and business operations.
S3 Prices, costs and profits	S3V1	Prices	→	Most of the products are handouts recycled back to market. In some cases, prices are subsidized through either by dealers on activation activities or by donor interventions.
	S3V2	Costs	→	In local markets and in settlements, costs per unit for standard solar product are high, however, a lots of counterfeit products have proliferated the market space and households have low knowledge to differentiate product types. For bigger, formal companies who start thinking about venturing into refugee settlements: First company failures point towards high per unit cost, products are oftentimes subsidized by donors
	S3V3	Profit margin	→	In Uganda in general, profit margins for energy products (solar SHS and lanterns) are extremely low due to factors ranging from high overhead, remoteness of the settlements, taxation as well as logistics, transport challenges
	S3V4	Investments	↗	Handful of solar companies have shown interest to start considering refugee markets as potential market for investment. Through RBF and other donor support, these are already starting to ventur into these market spaces.
S4 Supply chain and after-sales service	S4V1	Length	→	The supply chains are mostly short. Producers/distributors sell to the customers directly or via energy kiosks. Few solar companies are beginning to establish sales hubs and sales forces in settlements.
	S4V2	Distribution channels	↗	Current scenarios show that distribution channels are entirely pilot based activities and supported fully by donors.
	S4V3	Spatial reach	↗	Limited coverage of sales activities for solar in refugee settlements. Companies do not target all potential customers comprehensively. No risk taker companies, as the future and stability of the markets affect decision making for companies.
	S4V4	Initial suppliers	→	Not vibrantly established service industry exists in refugee settlements.
	S4V5	After-sales service	→	There are no professional service providers available for after-sales-services.
S5 Value chain	S5V1	Value added	→	No value addition systems exist in the refugee settings for solar energy.
S6 Business networks	S6V1	Networks	↗	In Uganda, the association USEA exists. However, these do not have a footprint of activities in refugee settings yet. The few companies penetrating the market are also members to the associations.
	S6V2	Partnerships	↗	Within refugee settlements, partnerships are still hard to find. However, donor activities, e.g. those from EnDev, Mercy Corps, USAID, Danish Refugee Council and Norwegian Refugee Committee have worked on individual initiatives and protocols to incentivise partnerships between dealers and distributors.
S7 Warranties	S7V1	Warranties	→	Hardly any warranties are offered.
S8 Entrepreneurial skills	S8V1	Financial literacy	↗	Low levels of financial literacy; book keeping is poor and business operations are mainly sole ownership with no written records.
	S8V2	Satisfaction level	→	Market-based sales of solar products have above average level of satisfaction due to novelty of products and services, but also partly because handouts and in-kind distribution and subsidies are still happening. Dealers improve outreach by increased customer satisfaction raising.
	S8V3	Marketing skills	↗	Kiosk operators, local vendors and marketeers within the settlements have very little marketing skills, dealers with more knowledge are not based in the settlement and often use unskilled personnel as distributors.
	S8V4	Advertising	→	Market participants have very little knowledge about advertising when it comes to local vendors. Bigger businesses do have some skills but hardly apply them in refugee settings.
	S8V5	Production automatization	▪	
	S8V6	Standardized production	▪	
D1 Product diversity	D1V1	Diversity	↗	The local markets still offer mainly SHS systems and lanterns, but this market system is distorted by humanitarian handouts. Development partners also support activities that introduce a wider range of higher quality solar products mostly sold by kiosks.
D2 Market penetration	D2V1	Market penetration	→	The % of households adopting and using standardized solar products is stagnating due to low penetration of solar products into the last mile households of refugees and hosts.
D3 Willingness to pay	D3V1	Willingness to pay	→	There is generally low willingness to pay market prices for solar products, especially due to very low awareness, and low disposable incomes as well as due to influencing factor of experiences with in-kind distribution. Willingness increases with length of stay in settlements and improved income opportunities over time.
D4 Systems in use	D4V1	Usage rate	↗	Usage rate is low, because in-kind distribution of stoves does usually not consider consumer preferences at the point of choice of the solar product to be distributed. However, where market-based approaches are implemented a relatively high usage rate can be assumed.
	D4V2	Maintenance	→	Very low levels of maintance and O&M schemes. Most tof the products lack technicians. Few cases of donors initiated maintenance trainings.
D5 Replacement and repair	D5V1	Replacement rate	↗	Generally low replacement rates
	D5V2	Repair rate	↗	Limited technicians and low options for repairs, most of the spoilt products are disposed as scrap in the environment.
D6 Consumer awareness and perception	D6V1	Awareness	↗	Higher proportion of consumers are aware of the products and technologies on market, but awareness is limted to economic and health benefits as humanitarian and development stakeholders increase activities in tailored awareness in these area to activate adoption.
	D6V2	Perception	↗	Many consumers' perceptions are not build on knowledge about the products and their benefits, but snowball effect of opinion leaders and friends or relatives.
E1 Policy	E1V1	National plans	↗	Through the CRRF and line ministries planning cycles, refugee planning process has been a shared responsibility of UNHCR with OPM (Office of the Priminister) in the past. Currently, UNHCR and OPM have developed targets for refugees' energy access in their national Refugee Response Plan. These targets respond to Goal No7 of the SDGs.
	E1V2	Policy	↑	The task force for the development of the Sustainable Energy Refugee Response Plan related to CRRF is established and first ideas for the content of the Plan developed.
	E1V3	Product taxes	↗	There is special tax relief for only solar pannels and direct accessories. However, it has been hard for the tax body to segregate other electrical products like batteries and wiring equipment which also serves other purposes from exemption.
	E1V4	Business taxes	↗	Business taxation is determined at the local authority level and variations exist between the different markets for same volumes of trade.
E2 Access to finance	E2V1	Subsidies	↑	Most solar products in the settlements currently constitute nearly 60% that have been distributed for free. There are efforts in place to introduce market-based approaches with some or no subsidies. Working with other development partners to change this paradigm of handouts is progressively growing.
	E2V2	Financing options suppliers	↗	No financing options existed. A gradual effort is being developed for the RBFs to introduce finacing options.
	E2V3	Financing options consumers	→	Solar companies hardly offer any substantial financing mechanisms and have low willingness to take risks because the refugee market appears unstable and fluid.
E3 Quality regulations, norms and standards	E3V1	Regulation, norms + standards	↗	Plans for new standards are being developed
	E3V2	Enforcement	↗	See solar sector EAMD score card
E4 Market information	E4V1	Cost of information	↗	Market information on the solar products in refugee settlements is provided by donors and humanitarian stakeholders and sometimes by the companies themselves to trigger sales. The topic is gaining attention as part of a development agenda to facilitate decision making by consumers.
	E4V2	Market facilitation organizations	↗	In refugee settlements, there are no specific market facilitation organisations except for some few development partner activities.
	E4V3	Awareness campaigns	→	Currently there are no big awareness campaigns.
E5 Expertise development	E5V1	Courses	↗	For refugees and hosts, there are no curriculum based standard technology trainings available. However, tailored short skills training are being implemented by donors and humanitarian partners to increase need based solutions.
	E5V2	BDT	↗	Lacking at most levels, piloting of skills developments for technicians and solar expertise are being implemented.
	E5V3	User training	↗	Lacking at most installations and service points. Few partners have set initiatives to develop user manuals and hands-on operator trainings.

Potential for contributing to (sub-)sector transition and/or market development	
Enabling environment	• Further support to the development of **key policy frameworks** to strengthen off-grid solar and ICS markets including further empowerment of sector associations like USEA. • Support **cookstoves standards development** through strategy support (National Action Plan), stove testing and production infrastructure support and development of new business models with high market potential for alternative fuels, i.e. electric cooking, biogas for SI and briquettes. • Support to market transition towards PU through setting-up a **PU Competence Cluster** to support companies in accessing market information, training and partnerships. • Advocacy and coordination among governmental, humanitarian, development and private-sector stakeholders to include **refugees' clean energy needs** into national policies and project implementation (e.g. electrification of health centers in refugee settlements).
Supply side	• Support to **professionalization and expansion** of ICS and solar companies for increased sales, spatial reach, value addition, networks and partnerships by providing targeted Business Development Services (BDS) including coaching. • Support **transition towards higher-tiers** and incentivizing product adaption for underserved target groups (MSMEs, SIs, last-mile households) by piloting new activities, e.g. Solar-for-Schools campaign. • Piloting **PU access with specific RBFs** (including in agricultural value chains); learnings to be adopted into other PU support mechanisms to grow market segment. • Further piloting of **market-based approaches in refugee settings**, including RBF, PU, energy kiosks.
Demand side	• Integration of marketing support in **new RBF partnerships** to increase demand and outreach. • Set up of incentives for ICS and solar companies to intensify **end-customer training and after sales services.** • Scaling up of **innovative finance and insurance approaches** (e.g. insurance model for the last-mile RBF; improved credit assessments of PAYGO customers). • Support to a nationwide **Clean Cooking Awareness Campaign**. • **Awareness raising** campaigns on benefits of quality energy products in refugee settings.
Other	• Provision of **COVID-19 relief support packages** to SMEs (communications bundles and safety packages). • **COVID Economic Relief Fund** under development aimed at supporting the ICS and solar sector to survive the COVID-19 crisis and increase resilience; the fund will target specific COVID-19 relief measures based on COVID-19 impact surveys e.g. bridging grants, additional marketing/promotional support, inventory support.

2. RBF Project Revision Document

Accelerating the Uptake of Off-Grid Solar Technologies with RBF in Bangladesh, Kenya, Rwanda, Tanzania and Uganda

Accelerating the Uptake of Off-Grid Solar Technologies with RBF in Bangladesh, Kenya, Rwanda, Tanzania and Uganda

1. RBF project revision

In June 2020, it was decided that the project will be:

- Scaled down target-wise taking into account the need to make adjustments to cater for concrete and anticipated COVID-19 pandemic implications

SMEs in the decentralized energy sector are significantly affected by the consequences of the COVID-19 pandemic: customers are no longer spending their money on solar systems, access to communities is restricted, supply chains are interrupted, staff numbers are cut, and investors are less inclined to become involved. The effects of COVID-19 are already heavily felt by energy entrepreneurs who are increasingly coming under financial distress, no matter the company size, the technology promoted, or geographical focus.
Based on the key findings of a consultation process with companies participating in the RBF project the key barrier identified is the lack of working capital to ensure liquidity to maintain businesses in a “stand-by mode” and ready to kick-start business operations, when the situations allows to. To continue implementing the RBF project, ensure target achievement and contribute to bridging the time until businesses can thrive again, a 70/30 percent split of incentive disbursement is proposed:

- 70% pre-sale disbursement: incentives will be paid upon verification of eligible products in the distributor’s local warehouse
- 30% post -sale disbursement: incentives will be paid upon verification of product sale to end-consumer

2. Adjustment of KPIs

Against this background, an adjustment of the incentive level and distribution between the pre- and post-sale incentive is requested with the following implications on target achievement. The budget remains unchanged.

RBF Key Performance Indicators (KPI)	Old targets	New targets
No. of people gaining access	1,163,254	1,111,015
No. of productive uses gaining access	21,426	6,992
EUR per person gaining access	5.66	6.34
t CO_2e emissions avoided (over the lifetime of the products sold during project)	148,214	148,214
EUR per t CO_2e emissions avoided	44.40	39.47
Private sector leverage ratio	13.0	13.0
Jobs created	310	300
Thereof jobs for females	75	70
Enterprises created / improved	50	45
Technologies deployed	264,953	247,331

Abbreviations

ADES	Association pour le Développement de l'Energie Solaire, Switzerland
AEPC	Alternative Energy Promotion Centre, Nepal
AVSI	Association of Volunteers in International Services
BBF	Bangladesh Bondhu Foundation
BCC	Behavioural Change and Communication
BDS	business development support
BMZ	German Federal Ministry of Economic Cooperation and Development
CLASP	Collaborative Labelling and Appliance Standard Program
DFAT / AUSAid	Australian Department of Foreign Affairs and Trade
DGIS	Netherlands Ministry of Foreign Affairs and Tra
DRC	Democratic Republic of the Congo
EAMD	Energy Access Market Development
ECCA	Ethiopian Clean Cooking Alliance
ECOWAS	Economic Community of West African States
ECREE	ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
EnDev	Energising Development programme
EPC	electric pressure cooker
ESDS	Energy Solutions for Displacement Settings
FCDO	UK Foreign, Commonwealth & Development Office
GCF	Green Climate Fund
GHG	greenhouse gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GOGLA	Global Off-Grid Lighting Association
GBE	Grüne Bürgerenergie – Green People‘s Energy Programme (BMZ)
HDI	Human Development Index
HH	households
HIVOS	Humanistisch Instituut voor Ontwikkelingssamenwerking
ICS	Improved Cookstoves
ISO	International Organization for Standardization

ITAC	Independent Technical Advisory Commitee
KOFIH	Korea Foundation for International Healthcare
KPI	key performance indicator
LDC	least developed countries
LNOB	Leave no one behind
LPG	liquefied petroleum gas
MCA	Millennium Challenge Account
MECS	Modern Energy Cooking Services Programme (FCDO)
MHP	micro hydropower
MW	mega watt
NAP	National Action Plan
NCF	Nordic Climate Fund
NDC	Nationally Determined Contributions
NEA	Nepal Electricity Authority
NGO	Non-governmental organisation
NIS	Nordic International Support Foundation
OECD DAC	Organisation for Economic Cooperation and Development - Development Assistance Committee
PAYGO	Pay-As-You-Go
picoPV	pico photo voltaic
PU	productive use of energy
QA	Quality Assessment
RBF	results-based financing
RE	renewable energy
RVO	Rijksdienst voor Ondernemend Nederland
SDC / DEZA	Swiss Agency for Development and Cooperation
SDG	sustainable development goals
SHS	solar home systems
SI	social institutions
SME	small and medium enterprise
SNV	Stichting Nederlandse Vrijwilligers / Netherlands Development Organisation
SREP	Scaling up Renewable Energy Program
TVET	Technical Vocational Educational and Training
USAID	United States Agency for International Development
USEA	Uganda Solar Energy Association

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Country facts in the Project Analysis sheets were taken from the following sources:

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