

# Ex-post Evaluation of EnDev Central America - energy access

## Executive summary

From 2006 to 2016, Energising Development (EnDev) promoted energy access in Honduras, Nicaragua and, to a lesser extent, Guatemala. This involved promoting improved cookstoves (ICS), grid extension, hydropower mini-grids (MHP), and off-grid solar. The project was implemented by Gesellschaft für Internationale Zusammenarbeit (GIZ).

This evaluation focuses on the activities in Nicaragua and Honduras. It builds on findings from a 2019 exit study carried out shortly after the project phased out.

## Background

When EnDev Central America began, energy access rates in Nicaragua and Honduras were relatively low. EnDev Central America focused on supporting government policies for rural electrification, including hydropower mini-grids. After 2015, the focus shifted to private sector engagement to develop the off-grid energy access market. Technological innovations in this market include off-grid solar PV, improved biomass cookstoves, and solar coffee dryers. These were financed with the support of the regional FOCAEP fund. This fund provided microcredits, revolving funds and technology or product subsidies to suppliers.

The demand and supply sides both benefitted from this approach. End users benefitted from measures that focused on access to micro-finance and local maintenance of energy access technologies. Providers benefitted from strengthened supply chains and links with the demand side through intermediary organisations such as cooperatives and associations. Activities in this approach also contributed to the development of minimum quality standards and capacity building of technology providers.

## Supply-side observations

**The off-grid solar PV and ICS markets are functioning well. However, they still rely on public financial support and services from intermediary organisations for instance, ensuring that after-sale warranties are respected.**

EnDev Central America focused on training and strengthening various stakeholders in the supply chain. These included technology providers, partner institutes, community organisations and technicians responsible for installing and maintaining technologies. After EnDev's exit, companies have continued marketing, selling and providing after-sales services for ICS and off-grid solar products. Several intermediary organisations have continued energy access activities and/or financing. However, the COVID-19 pandemic and the region's worsening economic and political situation have, in some cases, resulted in financial organisations taking a cautionary approach to expanding energy access lending. Many local microfinance institutions (MFIs) and rural banks

EnDev contracted Edburgh consultants and Danish Energy Management to conduct an independent ex-post evaluation of EnDev Central America. The main evaluation questions were:

- 1) What influence did EnDev's intervention have on sector development?
- 2) To what extent are local institutions ready (and have the capacity) to take over and contribute to developing a sustainable energy market?
- 3) What are the lessons learnt?

Ex-post studies are carried out at least 2 years after a project has been phased out. This desk-based evaluation was carried out between November 2021 and May 2022. The evaluation is based on an analysis of 23 relevant reports, studies, NDC documents, and 17 interviews with important stakeholders. The report is based on absolute numbers on country level. On global level, EnDev applies so called monitoring factors for attribution, additionally and sustainability and reports in adjusted numbers.

### EnDev Central America

<b>Project period</b>	2009 - 2019
<b>Budget</b>	USD 17,640,000

### Project results:

- Provided 245,788 people in households with access to cooking and 163,651 people in households with access to electricity.
- Supported 1,375 social institutions and 2,073 SMEs to get energy access.
- Trained technology providers, partner institutes, community organisations, and technicians responsible for installing and maintaining the technologies.

have limited financial resources and will continue to need support from development banks or donors.

### Demand-side observations

**The role of cooperatives and associations remains crucial in representing and facilitating access to end users in remote areas. Connecting suppliers with users enables the provision of after-sales services.**

In both Nicaragua and Honduras, EnDev succeeded in growing the market for stand-alone access technologies such as off-grid solar PV, improved cookstoves and solar coffee dryers. This was achieved by linking suppliers with rural households through intermediary organisations. This increased the visibility of solar panels, coffee dryers and improved cookstove technologies within remote communities and made it possible for companies to offer after-sales services. These aspects were important for those initially reluctant to use these technologies, as this generated trust and provided suppliers with valuable information and feedback from end users. Several of the intermediary organisations have continued their energy access technology activities since EnDev's exit. The activities of rural banks and MFIs also provide evidence for these continued activities. During EnDev Central America, the regional financing mechanism FOCAEP was set up, enabling access to financing for end users. FOCAEP is no longer active due to a lack of donor funding.

**Hydropower mini-grid (MHP) electricity is used for domestic and productive purposes. In general, MHP has boosted local economic development. Local MHP management structures exchange experiences on usage, repairs and maintenance. This contributes to the operational sustainability of mini-grids.**

EnDev Central America supported grid electrification via co-financing. EnDev supported hydropower mini-grids (MHP) via capacity strengthening and local stakeholder mobilisation. Grid extension actions reached the majority of end users. For mini-grids, the most significant impact on sector development was achieved when EnDev Central America used a holistic approach. This involved proving the importance of local ownership, exchanging information between communities, and finding synergies with productive uses and natural resource management. In general, the mini-grids are still functioning well. The local ownership of the hydropower mini-grids is likely the reason why. Different ownership models were applied, but the most critical part was having transparent financial management with tariffs that reflected actual operating costs.

### Enabling environment observations

**EnDev Central America can serve as an example of collaboration in EnDev countries that have a low degree of direct partnership with national government institutes.**

EnDev Central America aligned with the Nicaraguan and Honduran government policies on capacity building and technical support for electrification. In Honduras, EnDev's approach to energy planning was an inspiration for the current electrification plan.

The involvement of local government and local cooperatives and associations fits well in Honduras and Nicaragua's cultural and political context.

**Poor management and insufficient knowledge sharing have led to low awareness of EnDev's approach, results and lessons learned in Central America.**

EnDev Central America developed knowledge products such as manuals, technical guidance, and so on. However, these are not accessible to the wider professional community or the public. The academic sector could play an important role in systematising the knowledge that resulted from EnDev's activities.

### Conclusions

EnDev Central America contributed to increased energy access in Honduras and Nicaragua by technically and financially supporting publicly funded electrification initiatives and hydropower mini-grid projects. EnDev also played an important role in developing a niche market for stand-alone solutions such as off-grid solar PV, improved biomass cookstoves and solar (coffee) dryers. There are 2 main factors for market sustainability in both countries:

1. Local governance in hydropower mini-grids, and

2. Creating networks between businesses, end users, community organisations and financial institutes for stand-alone products.

