

# Impact Report: Community Energy And The Sustainable Energy Transition In Ethiopia, Malawi And Mozambique (CESET)

## CESET Impact Report

The CESET project has been at the forefront of promoting sustainable energy solutions, improving energy access, and driving impactful community development in underserved regions. Through innovative approaches, CESET has empowered communities with practical energy initiatives, supported policy-making in off-grid energy, and built local capacity for a sustainable energy future. This report highlights our key achievements, from enhancing health services with solar energy to championing gender equality in the energy sector.

## 1. Improving energy access in underserved communities

### 1.1. Community energy initiatives

CESET has worked closely with community energy managers to co-create practical solutions and enhance the sustainability of off-grid initiatives. In 2022, our teams embarked on a series of field visits to five off-grid energy projects in Malawi. This immersive experience provided valuable insights into the complexities of community energy, subsequently leading to our involvement in two of these projects through technical and financial support.

Between 2022 and 2024, CESET's technical support translated to significant improvements in the Chipopoma Power Project, strengthening the stability of the 40kW mini grid by preventing critical system failures and reducing risks from natural hazards through supplied protection equipment. John Saliency, the founder of Chipopoma Power Project, testified to the importance of these contributions, stating that "*without CESET, the project may no longer exist because we would have blown the alternator*". To further ensure the project's longevity, CESET delivered a 2-day technical training program, offering a comprehensive focus on the maintenance of the mini-grid system. This training has strengthened their capacity, enabling a more effective and proactive management of the mini-grid system.

By facilitating access to clean energy, CESET has also indirectly contributed to environmental sustainability and improved public health in Livingstonia. The project's expansion from 120 to 238 households has led to a significant decrease in firewood

dependence for cooking as most of these households use hotplates or tea kettles for cooking.

In southern Malawi, CESET assisted Mulanje Electricity Generation Agency (MEGA) in introducing a mobile-money payment solution for electricity. Purchasing electricity tokens required a 25-km journey to MEGA's offices, which raised security concerns due to the transportation of cash. During our site visit, MEGA's director, Arnold Kadziponye, underscored these critical challenges. CESET took action by providing the financial support to engage a consultancy firm, which in turn commissioned TNM to develop the mobile-money platform for the village. This payment solution has alleviated safety concerns while enhancing convenience for over 2,300 households. Additionally, the implementation of this platform has fostered communal welfare, as a percentage of the generated revenue is remitted to the community trust.

## 1.2. Off-grid health clinics

CESET has proactively addressed the challenge of unreliable energy in remote health centres in Ethiopia and Malawi, using solar PV technology to restore energy access and ensure sustainable healthcare delivery.

Remote healthcare facilities may possess basic medical equipment, but limited or inconsistent power hinders their ability to provide essential services. For instance, some centres rely on mobile flashes and lanterns during critical times to maintain basic operations.

In late 2020, an armed conflict in Ethiopia's Tigray region severely impacted healthcare facilities. The region witnessed destruction and looting of existing solar PV systems that previously provided electricity to local health centres. The combination of the geographic isolation and the conflict-related damage to infrastructure left health centres without the reliable power necessary for effective service delivery. To address this, CESET collaborated with the Tigray Regional Health Bureau and Mekelle University to identify the most affected health centres and restore their energy access through solar PV systems.

Of the five health facilities selected for the solar PV installations, four were successfully completed in 2023. Additionally, the healthcare staff received training on the safe operation and maintenance of the solar PV system, including cleaning procedures to remove the dust and other contaminants that can obstruct sunlight absorption.

The solar PV systems have drastically enhanced the functionality of the health facilities. Medical equipment, lighting, and refrigeration now operate consistently, enabling uninterrupted emergency care and safe deliveries. Reliable refrigeration has strengthened vaccine storage, supporting immunization efforts. Stable power also improves response times during emergencies, enhancing overall care quality. By improving service delivery, CESET has contributed to greater community well-being, empowering communities to depend on these centres for both preventive health measures and urgent medical care. More than 56 000 residents benefit from this enhanced quality of healthcare services.

The solar restoration project in Malawi is currently underway, while the fifth and final installation in Ethiopia is nearing completion.

## **2. Shaping policy at national level**

CESET actively contributed to shaping policies that promote off-grid energy initiatives in Mozambique. This was achieved through collaboration with government agencies, NGOs, and local communities. It marked a crucial milestone in CESET's mission to empower communities through sustainable energy solutions.

In 2021, the Mozambican government was drafting a new off-grid energy regulation. CESET had the opportunity to provide valuable feedback on the draft, directly and through the Mozambican Association for Renewable Energy (AMER), which consolidated the input and submitted it to Mozambique's independent energy regulator, ARENE. We advocated for a regulatory framework that would accommodate the unique needs of smaller-scale projects and empower communities to take ownership of off-grid initiatives. Its key recommendations included tailoring bureaucratic requirements based on project size, aligning tariffs to reflect community affordability and integrating community-led energy projects. These recommendations were partially adopted in the final regulation, which introduced a tiered approach to bureaucratic requirements (article 7) and aligned tariffs with consumer affordability (article 26). In December 2021, Mozambique enacted the regulation (Decree 93/2021), establishing a framework for energy access in off-grid areas.

CESET also played a role in advancing gender equality and social inclusion within Mozambique's energy sector. In collaboration with SNV, a global development partner, we established a network of feminist professionals in the energy sector. This group introduced the Gender Equality and Social Inclusion Seal (GESIS), a voluntary program for off-grid operators, sparking broader discussions across the sector. CESET played a prominent role in the sector-wide conference that took place in Maputo, in November 2022.

Following the conference, CESET influenced the Ministry of Mineral Resources and Energy (MIREME) by contributing to the development and subsequent approval of the Gender Strategy for Mineral Resources and Energy Sector in 2022. Throughout the year, CESET actively participated in drafting multiple reviews, offering insights into international practice and indicators. The Gender Strategy aims to integrate gender perspectives into energy planning and policies by training the ministry staff and encouraging the involvement of gender specialists. As stated by Angelina Bombe, MIREME's Gender Coordinator, this strategy signifies an important step towards addressing the gender disparities within the sector. Additionally, CESET supported the appointment of a Gender Focal Node to further champion gender inclusivity within the institution.

## **3. Building capacity for a sustainable energy future**

Our co-investigators at Mzuzu University and Mekelle University led training programs to empower local technicians and engineers in implementing renewable energy solutions. These programs were carefully designed to equip participants with the skills necessary to design, install, troubleshoot, and maintain renewable energy systems (RES) effectively.

In Ethiopia, Mekelle University focused on training both male and female technicians and engineers from various sectors in the Tigray region, including mining, energy, water and health. The objective was to improve the skillset of employed technicians in the field of

RES. As a result, participants became self-reliant in performing repairs, eliminating the need to outsource such services. Additionally, the training has also opened new opportunities for part-time work, with one noting that they now provide consultancy services to private companies working in the renewable energy sector.

In Malawi, Mzuzu University specifically targeted female technicians and engineers, reflecting CESET's broader commitment to promote gender equality and social inclusion in the energy sector. By placing women at the centre of energy transition, this program improves their opportunities to enter and advance in the energy workforce.

The first training program, held in March 2023, garnered media coverage and included 19 female participants. In a follow-up survey conducted twelve months later, all participants reported increased confidence and competence to succeed in the male-dominated field. Some described instances of exclusion and gender bias, of which they were able to overcome through the training. An Energy Efficiency Engineer wrote, 'I am now the supervisor for the project that we are about to implement, and I am currently heading the solar water pumping project'. This program has demonstrated the power of targeted training to address gender disparities in the energy sector. Four participants have either secured new positions or assumed new leadership positions.

Building on this success, Mzuzu University delivered a second training for 27 female technicians and engineers, attracting a competitive pool of 135 applicants. These efforts underscore CESET's efforts to fostering diversity and empowerment within the energy sector.

#### **4. Digital presence and audience reach**

The CESET website has demonstrated a global reach, with user engagement originating from diverse geographical locations such as the Netherlands, Germany, the United States, Finland, China and Brazil. A review of the past 28 days reveals 318 new users and 342 active users. Users most frequently access and interact with our published research and outputs.

A key focus of the CESET project has been organising workshops and conferences, which have served as an important platform for disseminating our research findings and promoting innovative solutions. This reach is a positive reflection of our commitment to sharing knowledge and contributing to a more informed global community on energy issues.

As we conclude the CESET project, we are grateful for the collaboration and support of all our partners and stakeholders.

We look forward to the continued application of the knowledge and insights gained from this project.

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Written by: Shirley Jeque Mutemba, December 2024

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