Report on panel presentations from the CESET Policy Event

25th September 2024

CESET
Community Energy and the Sustainable Energy Transition in Ethiopia, Malawi and Mozambique

Introduction

On 25th September 2025 CESET convened a workshop "Realising the Benefits of Community Energy for A Just Energy Transition" at the Royal Society in London.

Presentations were given on Community Energy in Practice, Experiences from Malawi by John Salience of Chipopoma Power, Arnold Kadziponye from the MEGA project and Dr Chrispin Gogoda from Mzuzu University. A presentation was also delivered by Clementina Gemo from SNV on Gender Equality and Social Inclusion in the Off-grid Energy Sector from Mozambique.

This report provides an overview of the presentations.

John Salience

Coming from the Northern part of Malawi, John manages a mini grid called Chipopoma Power. It is currently generating 40kW of electricity for a community, connecting 236 houses and a few businesses in the area. It also has a 3.5km range of HV (high voltage) light.

- The evolution of Chipopoma Power

The project commenced in 2015 where he sought to start an initiative at the village from which his mother came from. He introduced himself to the community, and subsequently explained that he wanted to harness the waterfalls to generate electricity for the community. This initiative was met with resistance as many problems arose in his quest to convince the community to start the project. Some feared that he would exploit the project for financial gain, and ultimately abandon the community. Fortunately, with some help, he was able to convince the community to start the initiative at the village. They started generating electricity in 2017. Starting with his brother's house, they were able to connect a total of 30 houses. In 2 weeks, they managed to connect 60 houses as more people expressed their interest in the electricity.

Prior to establishing a network, they encountered many challenges, such as securing adequate funding and procuring the essential components for the hydro plant. John was able to secure some initial funding for the project through the help of two colleagues, Naomi and Cameron. They were supplied with some scraps which enabled them to make a

local plumbing. They were also equipped with a 14kW inverter that could generate 40kW of power. However, they also encountered challenges with their turbine.

The project had started with a turbine that was not strong enough to hold the pressure. The plastic pipes would burst as soon as the generator turned on. Consequently, the turbine was breaking every day because the water was stretching off the caps. This further fueled the community skepticism regarding the project. John decided to build his own turbine that could last about 22 weeks. Once the turbine failed, he would build another one.

They came into contact with UNDP which proved to be instrumental in helping the project. UNDP supplied some strong pipes that could hold the pressure, along with some funding and training to help the project. The current turbine is strong enough to hold the pressure, but there are still frequencies that it cannot hold, such as those during peak hour lunchtime and dinnertime. As a course of action, there are plans to introduce load shedding to deal with the high frequencies during lunchtime. CESET has also provided direct technical and financial support to the project, including energy meters. Hence, the meters enable them to monitor the consumption of electricity.

Currently, there are 6 people helping with the maintenance of the project. With respect to decision-making, the process is similar to that of a company. There is a board of 7 members who are responsible for decision-making. The board also must report to the community chief, as the land was given for free by the community. Chipopoma Power is a community-based project.

Arnold Kadziponye

Coming from social enterprise, Mulanje Electricity Generation Agency, also known as MEGA. MEGA falls under the Mulanje Mountain Conservation Trust that manages the biodiversity of the Mulanje Mountain, the third highest mountain in central Africa. The area boasts a forest that has been a tourist attraction. However, due to population growth, the Conservation Trust had to identify some strategies to manage the forest.

There has been significant degradation of the forest from the use of biomass for cooking. Out of the Malawi population, 97% depend on fire biomass in the form of firewood or crop residues as their mode of cooking. As of today, only 17% of the population has access to electricity with rural communities at a mere 2%. Approximately 0.3% of the rural communities use electricity to cook. Therefore, MEGA is part of an initiative to conserve mountain resources. It promotes efficient cooking stoves that use less firewood compared to the traditional mode of cooking in Malawi.

- The evolution of MEGA

The community nearby, Bondo, had approached the national service provider, Escom, to secure electricity supply, as their location was 8km from the national grid. Unfortunately, the estimated cost for the transformer was too high, and the community could not raise the capital to have a transformer. They had concluded that electrification was not a possibility, until the Conversation Trust proposed otherwise. The Mulanje Mountain has many perennial rivers, and the topography allows for the generation of electricity. Upon doing some studies, they had identified the Lithuania River as a potential source of hydroelectric power.

Lacking hydropower expertise, the Conservative Trust partnered with Practical Action, which had extensive experience in Zimbabwe and Mozambique. Practical Action initiated

the feasibility studies and provided the Conservative Trust with the design of the project. They also funded a trip to Zimbabwe for the chiefs to learn how mini grids are run. However, it took over 6 years to have establish a powerhouse due to the lack of technical knowledge. With some financial support from the EU, the project was able to have its first 60kW plant. This plant provided electricity to 400 households within the community.

The initial expectations of free electricity contributed to the long wait of the project, which led to discussions on how the system would be maintained and sustained. A collective agreement was established whereby each household would pay 1000 Kwacha a month towards electricity costs. However, some households consumed more electricity than others, prompting the introduction of the prepaid metering system. The project demanded a sustainable approach to manage electricity generation and distribution, requiring both managerial and business skills. This eventuated in the founding of MEGA, a social enterprise, where the proceeds from therein are drafted back into the project to finance its growth. MEGA is responsible for the generation, as well as the distribution, of electricity.

- MEGA powerhouses

The first light was established in 2014, but the project was not yet licensed by the government to generate electricity. Further challenges were met within the government structure as there was no policy or guide on how community energy systems should be managed. It took a long time to obtain these licenses. They only obtained the generation license for the first powerhouse while they were setting up the second powerhouse in 2015. It was found that the river had the potential for another project. To obtain the distribution licence, the government needed to assess the transmission system and the potential risks, resulting in a year-long process. There was a situation in which floods had washed away the structure of second power plant in 2015. Fortunately, turbine and generator were still at the office, resulting in a significant cost saving from the flood. With the help of the NDP and Scottish government, they were able to develop a larger system, ultimately resulting in the third power plant.

At present, MEGA has 3 power houses that generate a total of 260 kW, providing electricity for 2300 households, and that is, approximately 15 000 direct beneficiaries. There are close to 2000 indirect beneficiaries that include 1 health facility, 4 secondary schools, 10 primary schools, 9 churches and 12 maize meals. The health facility was the first to be powered by the project. It served as a tangible demonstration of the project's potential as health services were needed in the community. This demonstration played a role in incentivising community engagement and subsequently, its members investing their labour towards the project. MEGA has employed 36 local members of the community as operators. To better cater to the community, a council, Village Electricity Community, was established where each village has to elect a representative for them. However, a member of the committee can only get elected twice.

They have done some feasibility studies that demonstrated the river's potential for 6.5 megawatts. MEGA plans to use 2.5 megawatts to connect 10 000 more customers and sell the rest to the national grid. This could generate good returns that can enable the MEGA to grow as an entity.

- Hydro plant model

The current hydro plant model has provided some valuable lessons, such that its model has been replicated by other projects. Community Energy Malawi, utilises the same model, but

with solar power instead of hydro. MEGA has also informed the mini grid framework for Malawi.

- Challenges faced

Convincing the community to invest its time and labour was not easy. It required substantial time and effort. Additionally, they had to persuade the chiefs to pay as they were insistent on receiving free electricity. There was also the lack of technical know-how. Mzuzu University and Malawi University of Business and Applied Sciences were instrumental in providing support due to their electricity-related research. Other challenges included the lack of policy framework, which did not facilitate the initiatives of community energy systems.

Chrispin Gogoda

Coming from Mzuzu University, one of the public universities in Malawi. Chrispin works in the Department of Energy System as a lecturer and head of department.

The renewable energy programme started in 2004. Mzuzu has a centre for testing and training new technologies called Configured, which offers specialised short courses. The department and centre collaborate closely to deliver content aligned with the department's focus. There have been other collaborations, such as the Emory project with the University of Strathclyde. This project has kickstarted the committee of energy systems issues with the development of Community Energy Malawi.

- The current state of community energy in Malawi

Through evaluations of community energy projects, the primary technologies being leveraged are solar PV and hydropower systems. In terms of ownership structures, some community energy systems are owned by the communities and others are owned by organisations. The proliferation of community energy in Malawi is the policy environment. There was a time in which the regulatory framework for such initiatives were non-existent. There was no guidance on how community energy systems could be run. However, there have been some improvements in the policy environment, including the main grid framework. With respect to the financial resources, UNDP and other organisations have provided funding for community energy systems. They found committee participation to be an interesting phenomenon, which has become a key aspect of promoting community energy in Malawi.

Active research has been undertaken by the department to assess the current approaches through the lens of what is working and what is not, to support community energy systems. There was a bad case in Malawi where the government built 6 mini grid systems that all failed within the first 2 years of their operations. This can be attributed to the lack of proper business models that could have been designed to ensure sustainability. Many of these systems succumb to failure from poor business models. Currently, there has been more thinking into the sustainability of these systems through improved business models. Some communities pay a fee for electricity consumptions to sustain the systems. However, an improved business model also requires a productive use of energy. Many of the systems are not capable of being sustained from the revenues that are generated from households. Thus, the productive use of energy plays a significant role in sustainability.

Given the low electrification rate in Malawi, the hope is to see more of these systems in communities. The grid connection in Malawi is approximately 12%. If off-grid systems were to be added, electrification could be up to 90%. Community energy systems constitute a rapid and practical solution. There needs to be learning on how community energy systems can be supported, and how they can be managed in the event of failure. Continuous improvement in the policy environment is also imperative in ensuring that these systems survive. It has been witnessed that different community energy systems are paying different tariffs, and arguably, it does not constitute as a good idea. It constitutes as an energy injustice as rural communities are unfairly burdened with high tariffs due to the nature of the energy delivered to them. It could be more effective for governments to provide subsidies, as this could better support community energy systems.

- Women in the energy transition

Women are particularly vulnerable to the consequences of inadequate electricity access. They are the ones that travel long distances to gather firewood and are exposed to hazardous fumes while cooking. It has been recognised that women need to be brought into the context of clean energy. With the support of CESET, there have been training programmes aimed at female technicians and engineers in Malawi. It was interesting to see a strong willingness from the women to engage in the training. For instance, the women participated in installing a backup system at the university. By bringing in more women, they can also be part of the solution with respect to energy transitions.

Clementina Gemo

Representing SNV, an NGO working in cooperation with CESET to promote gender equality and social inclusion in the energy sector within the Mozambican regulatory framework. The initiatives began in 2022 when the government was developing the regulatory framework for the off-grid energy sector in Mozambique. During this process, they identified that there was a missing tool in public policies that incentivised the government to improve cooking solutions.

- Gender Equality and Social Inclusion Seal (GESIS)

They decided to design a framework called the Gender Equality and Social Inclusion Seal (GESIS), whereby its main objective is to influence government practices to mainstream gender in the energy sector, including the off-grid areas. In 2023, the Minister of Energy approved the gender strategy in which it commits to develop a tool for private operators to mainstream gender in their operations. One of the markers in the gender strategy is related to the number of contracts signed by the government that include gender indicators. However, the framework is still non-existent as there is only the commitment of the gender strategy.

According to the World Bank, 61% of the population in Mozambique live in rural areas and only 24% can access electricity from the national grid. This implies that a significant portion of the rural population relies on the initiatives by private operators in Mozambique. It is essential for companies to possess a specific framework to navigate the integration of gender in their business model and to capture the social impact of these initiatives in the communities. The government needs a tool that can promote gender equality and social inclusion in the off-grid sector. However, the gender strategy still represents a notable step forward as no such tool had been endorsed by the government.

- The Brilho programme

Presently, the major challenge has been to get the GESIS framework approved. As part of the advocacy work in Mozambique, the Brilho programme, implemented by SNV, is testing this framework by working with 9 companies that provide cooking solutions and solar home systems. The objective is to evaluate the efficacy of the tool to ensure that it can add value to operators' activities.

One company that produces cook stoves did not have any representation of female employees until last year. Now, approximately 22% of the employees that produce the cook stoves are female, and there has been an improvement in the quality of the stoves. The diverse workforce has enabled an exchange of new perspectives and ideas that has consequently led to increasing sales from higher-quality stoves. Another case study is related to the female and male sales of solar home systems. An assessment showed that female sales representatives carried no rates of default payment, compared to male sales representations. This can be corroborated with data from SolarWorks in Mozambique. The objective of this exercise is to build strong evidence that illustrate the pertinence of the framework, thereby persuading the government and private operators to implement it.

If the country is to achieve universal access to energy as it has pledged, the failure to consider the gender imbalances and the different needs of specific groups will hinder the progress towards this goal. A large part of the population will not have access to the benefits of energy transition, specifically women. Men and other groups are also affected in different ways as energy poverty is shaping their roles and responsibilities in communities.

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