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Nordic Consulting Group A/S

Impact study of Beyond the Grid for Zambia

A case study as part of the Central Evaluation of Sida's work with Poverty



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The views and interpretations expressed in this report are the authors' and do not necessarily reflect those of the Swedish International Development Cooperation Agency, Sida.

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Abbreviations and acronyms

BGFA	Beyond the Grid Fund Africa
BGFZ	Beyond the Grid Fund Zambia
DHS	Demographic and Health Survey
ESP	Energy Service Provider
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
LCMS	Living Conditions Measurement Survey
MDPA	Multidimensional Poverty Analysis
MFCA	Modern Cooking Facility for Africa
MPI	Multidimensional Poverty Index
NEFCO	Nordic Environment Finance Corporation
OPHI	Oxford Policy and Human Development Initiative
REACT	Renewable Energy and Adaptation to Climate Technologies
REEEP	Renewable Energy and Energy Efficiency Partnership
SDG	Sustainable Development Goal
SEK	Swedish Kroner
Sida	The Swedish International Development Cooperation Agency
ToC	Theory of Change
USD	United States Dollars

Executive Summary

Beyond the Grid Fund Zambia (BGFZ) was designed to create access to basic and affordable renewable energy services for energy poor people living outside the national electricity grid. This was to be achieved by incentivising private sector companies' expansion and investment in off-grid energy generation, distribution and service delivery. In this way, BGFZ aimed at enabling access to clean, modern energy services for more than one million Zambians living in peri urban and rural areas.

Our study shows that the impact and outreach from BGFZ has been impressive. The programme managed to reach more than one million people, most of them new customers who had not been able to access energy products and services before and had no access to a good alternative. The access to basic energy services has contributed to enhanced quality of life for the costumers and their families, although there is an absence of real evidence on health and education impacts. We also found that the focus on productive use of the energy products has not been high.

While the majority of the customers are people living in poverty, there are indications that BGFZ has faced challenges in effectively targeting and reaching under-served people living in poverty to a sufficient extent. Thus, while BGFZ overall has demonstrated an innovative and successful model for market penetration of unserved poor costumers for energy products and services, including cooking stoves, the distribution model has had some challenges and a viable business model for how to reach the “last mile” is still to be developed.

1 Introduction

This report presents an impact assessment of the Contribution “**Beyond the Grid Fund Zambia**” (BGFZ). The case study constitutes a part of the overall “Strategic Evaluation of Sida’s Work with Poverty”.¹ It aims to contribute to learning and informed decision-making rather than control or accountability.

BGFZ was designed to create access to basic and affordable renewable energy services for energy poor people living outside the national electricity grid. This was to be achieved by incentivising private sector companies’ expansion and investment in off-grid energy generation, distribution and service delivery. Overall, BGFZ aimed at enabling access to clean, modern energy services for more than one million Zambians living in peri urban and rural areas. The analysis in the report is primarily based on desk research and supplementary key stakeholder interviews.

The report is organised in the following way: In Chapter 2, the contribution case is presented and contextualised. Chapter 3 includes an outline of the main data sources and methods applied in the impact study. In Chapter 4, a reconstructed Theory of Change (ToC) for the contribution case is being presented and discussed. This is followed by a presentation of key impact findings in Chapter 5. Finally, in Chapter 6 the conclusions are presented.

Sida defines multidimensional poverty as deprivations within four dimensions - resources, opportunities and choice, power and voice and human security. Sida defines a person living in multidimensional poverty as being resource-poor and poor in one or several of the other dimensions.

Note that this definition is broader than the definition used in for instance OPHIs national multidimensional poverty index (MPI) and the World Bank definition of multidimensional poverty that uses the MPI in combination with monetary poverty.

Source: Sida (2019), Dimensions of Poverty, poverty toolbox.

¹ There are seven other case studies, which are presented in separate reports.

2 The contribution at a glance

Table 1. Overview of the contribution

Contribution name	Beyond the Grid Fund Zambia (BGFZ)
Agreement partner	Renewable Energy and Energy Efficiency Partnership (REEEP)
Implementing companies (Energy Service Providers)	• VITALITE Zambia Ltd • Emerging Cooking Solutions (ECS) Zambia Ltd (also known as SupaMoto) • Fenix International Zambia • Standard Microgrid Initiatives (SMI) Ltd
Implementation period	2017-2020 (extended to 2022)
Date of approval	6/12/2016
Sida strategy	Strategy for Sweden's development cooperation with Zambia 2018-2022. Strategy Area 3: Environment, climate, renewable energy and sustainable, inclusive economic development and livelihoods.
Total budget	SEK 551 million (including co-finance leveraged) ²
Total Sida contribution	SEK 200 million (from 2017-2022) ³
Sida poverty indicators	Opportunities & choices and resources
Geographic coverage	National, across all 10 Provinces of Zambia
Sector/sub-sector	Greater access to renewable energy and improved energy efficiency

BGFZ was financed and launched in December 2016 by the Swedish Embassy in Lusaka with the aim to radically expand access to clean off-grid energy, such as solar home systems and mini-grids, and kick-start the market for affordable, reliable and clean energy services provided by the private sector in rural and peri-urban areas. With a planned investment of around SEK 200 million, about 1,5 million people in Zambia were expected to be reached with basic electricity services for lighting, phone charging

² BGFZ Portfolio overview Dec. 2022.

³ Several decisions were taken to prepare for BGFZ: 18/12/2015: Establishment of BGFZ and to enter into agreement with Renewable Energy and Energy Efficiency Partnership (REEEP) to develop the Fund for SEK 8 million during 2016-2017. In 2016, the procurement of the Energy Service Providers was initiated and the budget frame increased to an estimated SEK 40 million. On 6/12/2016 Sida decided to deviate from having an overall commitment agreement (outside the contract with REEEP) and the funding framework was increased to SEK 200 million. On 15/12/2016 a decision to award contract to 5 Energy Service Providers for a maximum of SEK 150 million was decided. Later it was reduced to 4 the Energy Service Providers. Sida (2019), Appraisal of Intervention: Power Africa – Beyond the Grid Fund Zambia.

and running of small appliances such as fans, TV and radio. It was also expected that the electricity in some cases also could be used to power larger appliances such as water pumps and biomass gasification stoves. Ultimately, it was expected that this would lead to improved livelihoods and catalyse economic activities in rural and peri-urban areas of Zambia.

BGFZ was co-designed with the *Renewable Energy and Energy Efficiency Partnership* (REEEP) as a holistic and whole-of-system programme to address key market challenges and support the basis for a longer-term, sustainable, market-based growth in Zambia's renewable energy sub-sector.

BGFZ was based on a *Social Impact Procurement approach*,⁴ procuring “social impact” by providing energy services to poor Zambian consumers. BGFZ did this by covering some of the risks private companies face when operating in uncertain markets in developing countries. The backbone of the BGFZ approach was an innovative financing mechanism that offered incentives to Energy Service Providers to close the ‘viability gap’ on a per-connection basis of the rollout and scaling up of clean energy services in areas that would otherwise not represent viable markets.

In addition to the financial incentives offered, the contracted companies were provided with technical assistance to develop their businesses and secure finance (see below). The BGFZ design comprised three interdependent pillars:

1) Provision of grants and technical support to Energy Service Providers. For the implementation of BGFZ, the Swedish Embassy entered in mid-2017 into commercial contracts with four Energy Service Providers (private companies) in Zambia through a public procurement process. The four companies were Vitalite, Emerging Cooking Solutions (ECS)/SupaMoto, Fenix and Standard Microgrid Initiatives (SMI). BGFZ provided grant funding of around USD 2-3 million to each of the four ESPs, disbursed in tranches throughout the implementation period.

The grant amounts were determined through a reverse auction, where sellers - in this case, Energy Service Providers - bid on the prices at which they are willing to sell their goods and services to BGFZ. Payments were linked to agreed deliverables and results. Additionally, the Energy Service Providers were required to raise co-financing, with a target leverage ratio of 4:1 against the BGFZ funding. Three of the Energy Service Providers relied on business models offering energy services through solar home

⁴ The major difference between the BGFZ Social Impact Procurement and a traditional procurement lies in what is being procured, and in how it is being evaluated, investigated, monitored and verified.

systems, of which one also was pioneering a solar-powered cookstove using pellets in its product offering.⁵ One Energy Service Providers was a mini-grid pioneer in Zambia with a technology that would allow for a greater longevity compared to the solar home systems. Business advisory support was provided to the companies alongside the funding awards and investment support was offered to all companies to advise on mobilising finance, as was technical support to implement data reporting systems. Monthly meetings were conducted with senior management of each company to discuss business plan progress.

2) Establishing and running a platform for market change. BGFZ aimed to improve market ecosystem conditions through a combination of capacity building and technical assistance, stakeholder outreach, and market intelligence development. The aim of establishing and running a stakeholder platform for market change was to improve the learning in the market, coordinate with relevant stakeholders (government, donors, finance, private sector) to promote synergies, avoid duplication and with that enable a more efficient use of donor funding, provide market information, coordinate capacity and awareness raising.

After a comprehensive consultation process with other development partners, key sector stakeholders and various departments of the Zambian Government, an Off-grid Energy Task Force was formalised by the end of 2017. It was embedded within the Department of Energy within the Ministry of Energy and the Office of the Vice President. REEEP was tasked to convene the Task Force by providing secretariat services. The Task Force convened key stakeholders from the government, donor agencies, finance and the private sector.

3) Improvement of market information and analytics. The visionary software platform EDISON (Energy Data and Intelligence System for Off-Grid Networks) was identified by BGFZ as an appropriate data system solution to fulfil both reporting requirements and provide improved market information and thereby the best approach to implementing the objectives of BGFZ pillar 3 during implementation. These objectives included provision of a low-burden reporting system for the four ESPs to track active systems in use by households and supporting improved information for

⁵ SupaMoto pioneered the use of pelletised waste-biomass for heating, developing clean and affordable alternatives to traditional charcoal-based cooking. The pellets were made out of sustainable forestry waste and the stoves sold were running on pellets instead of charcoal. The stoves were built with an internal combustion system that produced clean gas emissions from the pellets. Besides being more energy efficient than an electric stove, this was estimated to reduce cooking time by 75%, allow for indoor cooking, and keeping carbon monoxide at bay. The pellets were up to 40% cheaper than charcoal.

programme management for BGFZ and for the companies. The pillar also aimed to generate market intelligence to improve information and transparency for use by government, companies, investors, and wider sector stakeholders. See further discussion and assessment of EDISON in Chapter 3.

As a portfolio, the four Energy Service Providers were initially contracted to deliver more than 300,000 energy service subscriptions, i.e. connections made by end-customers entering into a contract with an ESP for the provision of energy services. This would benefit 1.5 million Zambians within the intended four-year implementation period (2017-2020). However, all the contracts were amended during the implementation period due to reasons related to learnings of the business model implementation and/or market developments, including the global COVID-19 pandemic. As a result, the final amended contracted delivery of the energy service subscriptions was extended to 2022, and the target reduced to benefit a minimum of one million peri-urban and rural people in Zambia with access to basic energy.

2.1 THE ZAMBIAN DEVELOPMENT CONTEXT

Poverty in Zambia

Consumption poverty in Zambia, defined as the share of the population living on less than USD 1.90 per day, has risen over the past decade, increasing from 54% in 2015 to 60% in 2022 (Table 2). The share of the population identified as multidimensionally poor (based on the Multidimensional Poverty Index) was 48% in 2018, and the share in severe multidimensional poverty was 21%.⁶

Table 2. Poverty in Zambia disaggregated by rural/urban divide

	Share in severe MPI poverty (2018)	Share in MPI poverty (2018)	Consumption poverty (2015)	Consumption poverty (2022)
Urban (40% of the population)	6%	21%	23%	32%
Rural (60% of the population)	31%	66%	77%	79%
National	21%	48%	54%	60%

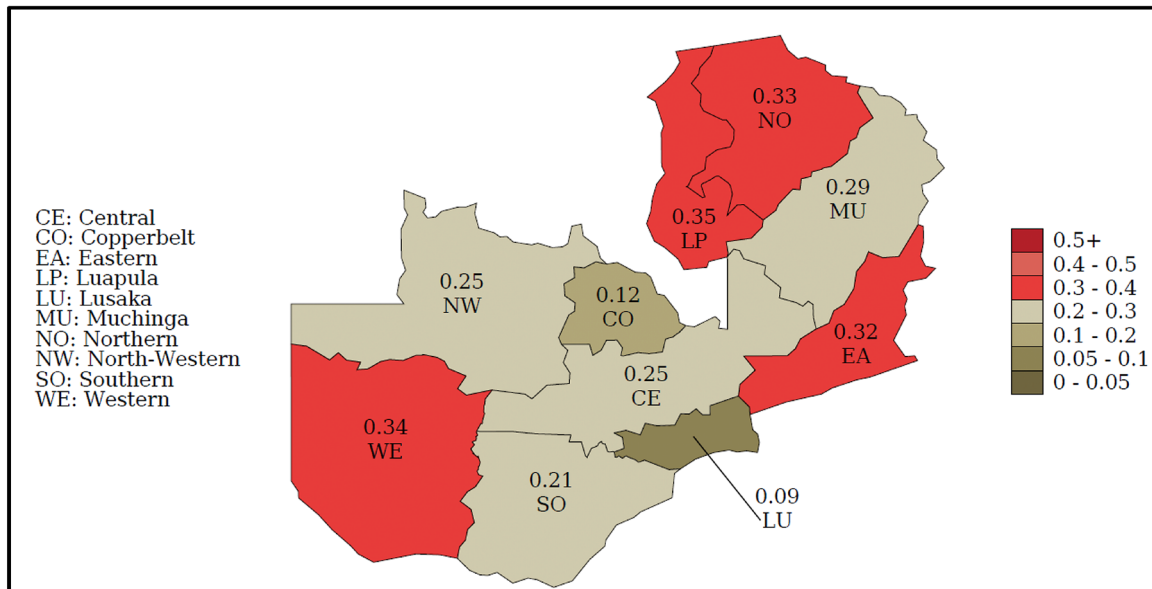
Source for MPI poverty: Global MPI Country Briefing 2020: Zambia, OPHI, July 2020. The figures are based on the headcount, H, which refers to the share of the population that are multidimensional poor. The multidimensional poverty index is based on deprivation in health, education, resources. Sources for Consumption poverty: Living Conditions Measurement Survey (LCMS) 2022, figure 12.1. Sources for rest: OPHI (2024).

⁶ It is to be noted that the Multidimensional Poverty Index is a quite different concept than Sida's Multidimensional Poverty Analysis (MDPA).

Zambia suffers from extremely high inequalities with a severe divide between rural and urban areas. Table 2 shows that 60% of the population live in rural areas, and of those 79% are poor in terms of consumption. For urban areas, the figure is 32%. It is however noted that income poverty has been increasing fastest in urban areas during the period.

Figure 1 shows the Multidimensional Poverty Index per province, based on Demographic and Health Survey (DHS) data from 2018. Luapula was the province with the highest poverty rate but also Eastern, Northern and Western Provinces are listed as provinces with similar high poverty incidences.⁷ This situation was confirmed when Sida re-assessed the poverty dimensions in Zambia as part of their Mid-Term Review of the country strategy.⁸

Figure 1. Multidimensional poverty index per province based on the 2018 DHS



Source: *Global MPI Country Briefing 2020: Zambia*, OPHI, July 2020. Data based on the 2018 DHS. The multidimensional poverty index is calculated as the prevalence (H) times the intensity (A), see the source for further details.

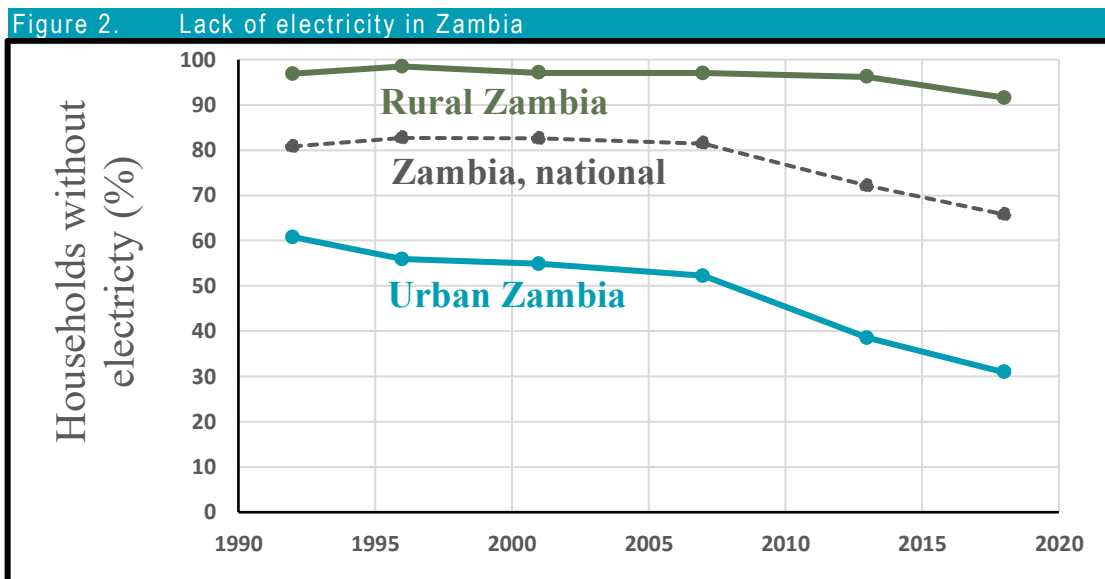
⁷ Embassy of Sweden, Lusaka (2020) Mid-Term Review of Swedish Development Cooperation with Zambia 2018-2022.

⁸ Embassy of Sweden, Lusaka (2018) Poverty analysis Zambia 2018; Embassy of Sweden, Lusaka (2020) Mid-Term Review of Swedish Development Cooperation with Zambia 2018-2022.

Energy access – urban vs. rural areas

Data from a Global Survey on energy access, launched by the World Bank in 2017 in Zambia,⁹ showed large gaps in energy access between urban and rural areas in 2017:

- 1.4 million Zambian households (42.4%) had access to electricity through either national grid or off-grid sources, while the remaining 1.9 million households (57.6%) have no access to electricity.
- Out of the 42.4% with electricity, most (37.7% of all households) are connected to the national grid, while the remaining 4.7% primarily use off-grid solutions.
- The difference in access to electricity between urban and rural areas is substantial: most urban households (74.8%) access electricity through the national grid, yet the majority of rural households (88.1%) have no access to any kind of electricity source.
- 60.7% of urban households use a traditional charcoal stove (Mbaula) as their primary cooking solution, while 83.6% of rural households use open fires. Electric stoves are the primary cooking solution for 32.5% of urban households.



Source: DHS, data compiler.

Figure 2 (based on DHS data) confirms the large gaps observed in energy access between urban and rural areas in Zambia. The figure further illustrates that the gap

⁹ World Bank 2019. Zambia - Beyond Connections: Energy Access Diagnostic Report. The household survey sample selection was designed to be representative of the country at large. A total of 3,612 households from all the 10 provinces of Zambia were surveyed, both urban and rural areas.

widened in the period from 1992 to 2018 and that a significant improvement in national coverage in the period 2007 to 2017, mainly was driven by an improved energy access in urban areas. In the period from 2013 to 2018, some improvements started to show also in rural areas. A key objective of BGFZ was to activate a market for off-grid services within peri urban and rural areas. However, with only around 4,000 customers and no more than three operating Energy Service Providers in Zambia, Zambia was at the inception stage of BGFZ classified as a non-active market. The vast majority of the existing off-grid sources at the time consisted of home solar systems.

2.2 THE SIDA PROJECT RATIONALE

The BGFZ project represent a shift in focus for Sida's energy support in Zambia.¹⁰ Before 2015, Sweden largely funded the expansion of national grids into unserved rural areas in Zambia (and other African countries), mainly reaching rural towns. Many of the customers reached were in the middle-income category. The project costs were around SEK 20,000 per connection and this high cost limited the number of people reached. As a result, the progress on new connections lagged behind the population growth. Moreover, unless the electrification was able to reach rural industries, electricity remained limited to lighting and small appliances. Energy providers also often struggled to cover the operating and maintenance costs of the infrastructure due to low tariffs and limited loads.

When Sida initiated the support to BGFZ in 2017, the focus changed from on-grid to off-grid energy, aiming to reach poorer segments of the population than before, and with more sustainable energy solutions. The support facilitated entrance and scale up of Energy Service Providers that provided off-grid energy access to customers on a "lease to own" business model. In this model, project costs per connection were below SEK 400, covering approximately 25% of the capital investment cost needed for companies to establish themselves at scale and operate commercially sustainable businesses. Once an off-grid pro-poor market would become active (estimated when one company will be selling to more than 20,000 customers), it can be considered sufficiently developed for provision of subsidies to target the poorest who are unable to afford the service fees required to cover the investment and operating costs. Unless Energy Service Providers are already active in the market, the level of project funding required would be expected to increase to allow for the companies to reach both energy poor and the poorest market segments.

¹⁰ This section describes this shift and the rationale for the BGFZ, drawing on interviews with Sida staff and a review of relevant documents.

3 Data and methods

3.1 OVERALL APPROACH

The aim of the case studies has been to assess the impact of Sida's contributions on poverty, in line with the overall objective of Swedish development cooperation, namely, *to create preconditions for better living conditions for people living in poverty and under oppression*. For this case, the aim is thus to assess the degree to which BGFZ has contributed to reduce multi-dimensional poverty in Zambia.

A mixed method, theory-based approach has been applied, reconstructing the programme's ToC to assess the causal chain of the intervention to understand *how* and *why* an impact has been achieved (or not). The assessment also considers the underlying assumptions of the BFGZ ToC, and whether these have held in practice or not.

In this case study, we primarily draw on secondary data sources made available. Analysis of these data has been conducted and compared with other publicly available data and supplemented by key stakeholder interviews conducted with the Swedish Embassy in Zambia and Sida staff in Stockholm.

In the following sections, we elaborate further on data availability, reliability and credibility, and the limitations to the case study and its findings.

3.2 DATA AVAILABILITY AND ANALYSIS

While BGFZ has put substantial emphasis on data collection and analytics it has not been possible to access updated data. The four Energy Service Providers have reported daily on indicators in the EDISON Platform, allowing for generation of real-time data.¹¹ However, with the expansion of BGFZ to Beyond the Grid for Africa (BGFA)¹² an assessment of the EDISON platform was conducted, and it became clear that several elements needed to be revised to allow for the scaled span.¹³ It was decided to

¹¹ Sida (2021), The Power Africa Project at Sida: Innovative mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019; Oxford Policy Management (2021) Evaluation of MRV aspects of the Beyond the Grid Fund for Zambia and the EDISON software platform.

¹² In 2019, BGFZ was scaled up to also include Mozambique, Burkina Faso, Liberia and Uganda (2020) and DRC (2021) under the Beyond the Grid Fund Africa (BGFA) programme. BGFA is implemented by Nordic Environment Finance Corporation (NEFCO) and REEEP. The total initial budget of BGFA was about EUR 120 million.

¹³ Oxford Policy Management (2021) Evaluation of MRV aspects of the Beyond the Grid Fund for Zambia and the EDISON software platform.

phase out the use of EDISON and instead continue the data collection through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) PROSPECT project. Since the transfer of data from BGFZ was ongoing and the legal basis for accessing the data had not yet been established, we could not get access to raw data and has had to rely on already existing analyses of impact instead.

While the data in EDISON relies on the Energy Service Providers' self-reporting, an assessment was conducted by the social impact measurement company 60 Decibels to verify the data in May 2021. Thus, rather solid data exists on quality-of-life changes and reasons, challenges, customer satisfaction and access to alternatives (choice).¹⁴ EDISON also tracks data on e.g. jobs created, number of female customers etc., but these have unfortunately not been verified by 60 Decibels and are thus less reliable. Some of these elements were further investigated in the "Midterm Evaluation of the Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification" (2020) but from a more qualitative perspective. The Ex-post Evaluation of BGFZ (2024) also includes some analysis of these elements but is also based on already existing data (60 Decibel), REEEP's Final Report, additional assessments and qualitative interviews.

3.3 DATA RELIABILITY AND CREDIBILITY

We have been using three main evaluations and assessments for this impact study of BGFZ: two external evaluations conducted by, respectively, Greencroft Economics (Ex-post Evaluation, 2024) and Nordic Consulting Group (NCG) (Mid-term Evaluation of the Power Africa Project, 2020)¹⁵ and one social impact performance assessment by 60 Decibel. Source criticism of these assessments/evaluations is presented in Table 3 - Table 5. We also draw on data from the EDISON platform. Besides that, qualitative interviews have been conducted with Sida staff at Headquarters and at the Embassy in Lusaka to understand the development after the Midterm Evaluation was conducted in 2020.

¹⁴ 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

¹⁵ The NCG consultancy team conducting this current impact study was also part of the Midterm Evaluation of Sida's Power Africa Project so the source criticism is not fully objective. On the other hand the team has collected primary data on BGFZ and thus has first hand in-depth knowledge of BGFZ.

Table 3. Source criticism of Ex-post Evaluation of the BGFZ

Criteria	Ex-post Evaluation of the Beyond the Grid Fund for Zambia (BGFZ), May 2024
Usability	Impact is included in the assessment but mainly based on 60 Decibel assessment so limited new findings on impact.
Credibility	Independent evaluation report conducted by external consultants
Results level	Impact data from 60 Decibel and BGFZ final report but only limited additional information on impact level.
Data quality	30 qualitative interviews have been conducted but otherwise data has relied on the 60 Decibel assessment and Renewable Energy and Energy Efficiency Partnership (REEEP)'s own monitoring and reporting.
Quantitative/qualitative evidence	Qualitative but applies quantitative data from 60 Decibel. It does not refer to the Midterm Evaluation of the Power Africa Project (2020) where BGFZ was substantially assessed, this is a limitation. Methodology, including sample selection, is not rigorously explained.
Reliability	Reliable although main elements are based on other data sources.
Conclusion	Sufficient confidence

Table 4. Source criticism of 60 Decibel: BGFZ

Criteria	60 Decibel: Beyond the Grid Fund Zambia, 2021
Usability	Links access to energy with social impact and thus highly relevant for assessing not only achievements of BGFZ but also for testing assumptions in the ToC.
Credibility	The assessment is conducted by an independent end-to-end impact measurement company who have developed social impact indicators for the off-grid renewable energy sector.
Results level	Social impact data
Data quality	High quality
Quantitative/qualitative evidence	Quantitative survey of 626 BGFZ supported customers across the country, verification of monitoring data collected through the EDISON platform to calculate data accuracy. Benchmarking with other energy service providers conducted since 2016. 60 Decibel randomly selected the 626 customers from the dataset for the sample. The sample selected is representative for the overall database shared by the Energy Service Providers with 60 Decibel by product type and region.
Reliability	Highly reliable
Conclusion	High confidence and highly useful with benchmarking with other renewable energy companies.

Table 5. Source criticism of Midterm Evaluation of Power Africa Project	
Criteria	Mid-Term Evaluation of the Power Africa Project at Sida, 2020
Usability	Main focus on relevance, efficiency and effectiveness of the Power Africa Project and less on impact and sustainability although trajectory of impact is included. BGFZ was a key element of the Midterm Evaluation but the focus was on all Power Africa Project interventions across Africa.
Credibility	Independent Midterm Evaluation report.
Results level	Mainly outcome level but trajectory towards impact and sustainability included.
Data quality	Around 100 qualitative interviews, country case studies in Zambia, Tanzania, Kenya and Ethiopia, three participatory workshops in Sida. The interview persons were selected through a purposive sampling process, in order to ensure balanced coverage of countries and key stakeholder groups.
Quantitative/qualitative evidence	Primarily qualitative data collection but triangulated with a highly invested Evaluation Reference Group and Sida stakeholders through participatory workshops.
Reliability	Reliable
Conclusion	High confidence with some indications of impact, although the Midterm Evaluation spanned greater than BGFZ and had a stronger focus on effectiveness than impact.

High confidence	Sufficient confidence	Limited confidence	Insufficient evidence
Based on usability, addresses impact level, identified bias mitigated, good data quality	Confidence reduced by shortcomings to usability, indications of bias not mitigated, less convincing data quality	Low confidence due to lack of usability, clear bias not mitigated, poor data quality	Insufficient evidence to support a contribution judgement

3.4 LIMITATIONS

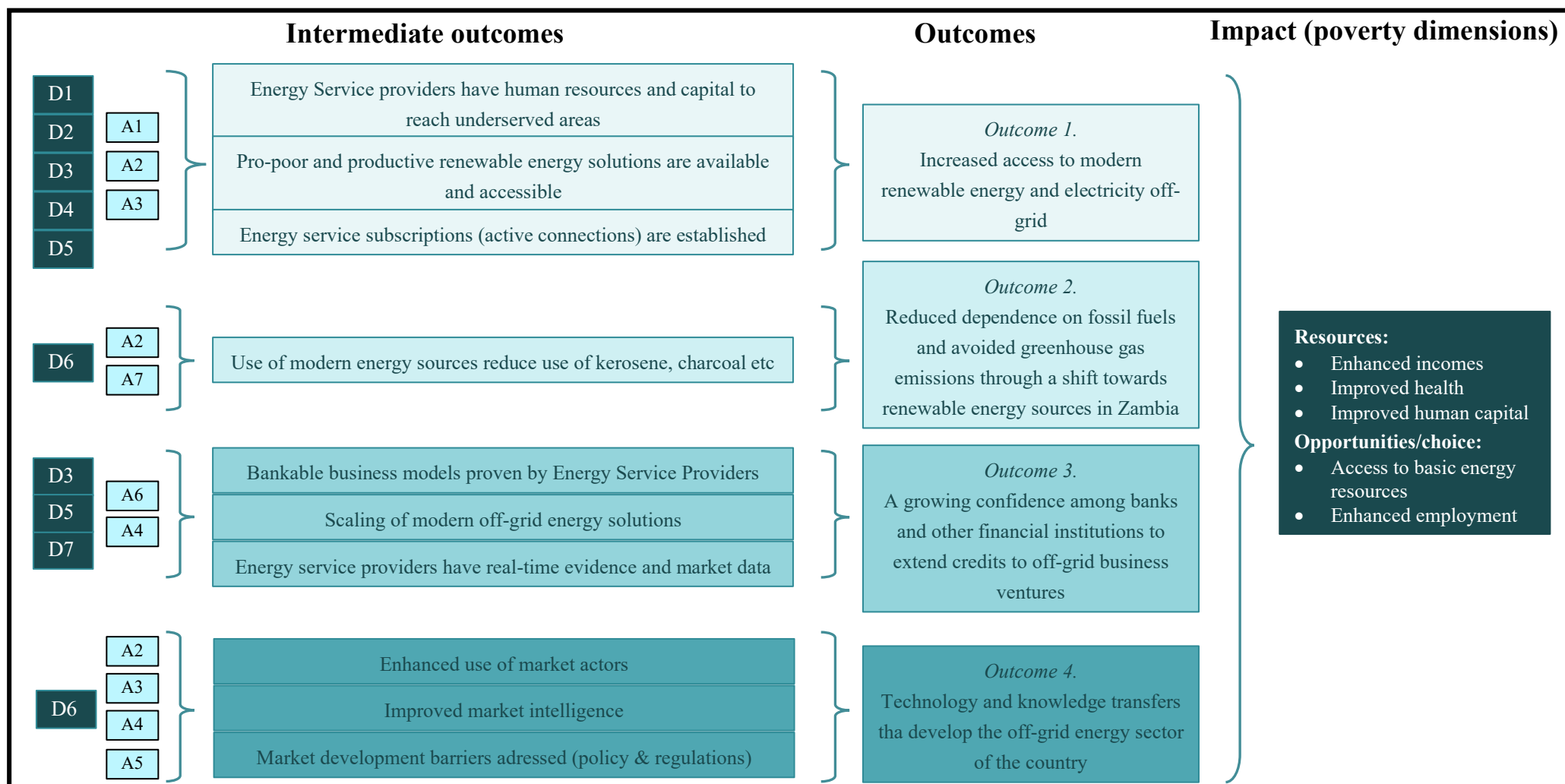
- It was not possible to get access to raw data from the EDISON platform. This limited the possibility for cross-tabulation of data.
- Limited evidence was found on access to energy's impact on health and education which are key assumptions of the BGFZ's Theory of Change (ToC).
- There are some discussions of employment generated by the Energy Service Providers in the Ex-post Evaluation and data is gender disaggregated which is essential. Nevertheless, there is no assessment of impact on women's employment and the assumption that women are empowered by acquiring an employment is not further tested. Thus, assumptions on long-term impacts on health, education and employment have not been substantially tested and remains assumptions.

4 Theory of Change and Sida's poverty dimensions

Two envisioned impacts have been defined for BGFZ: i) enhanced income and employment; and ii) enhanced quality of life through education and health. BGFZ recognises that access to energy is not an aim in itself but rather a means to achieve social impact, such as improved education and health. Employment is to be achieved through the Energy Service Providers expanding their businesses to semi-urban or rural areas while enhanced quality of life is assumed to occur when households get access to energy allowing study time also in the evenings and reduce the use of e.g. kerosene lamps, thereby enhancing health conditions in the households. A key assumption is that market development will trickle down and increasingly benefit the poor.

As illustrated in the ToC (Figure 3), BGFZ targets Sida's poverty dimensions resources (productive resources) and opportunities and choice (access to infrastructure). Education and health care are part of both poverty dimensions. The ToC has been reconstructed from BGFZ programme documents and validated with Sida staff engaged in BGFZ implementation. The discussions in the following sections will take point of departure in the reconstructed ToC, and the outcome and impact areas defined here.

Figure 3. Reconstructed ToC



Assumptions

- A1: Zambians understand the benefit of and are interested in purchasing renewable energy
- A2: ESPs and national stakeholders apply technology and knowledge in practice
- A3: Sufficient human resources available
- A4: Continuous political commitment
- A5: Market development will trigger down to the poor
- A6: Jobs created will support women's empowerment
- A7: Access to renewable energy will reduce use of fossil fuels
- A8: Access to modern cooking solutions will reduce HH air pollution

Drivers (approaches)

- D1: Transparent public procurement
- D2: Awareness raising of renewable energy benefits
- D3: Grants to kick-start scaling
- D4: Capacity building of ESPs
- D5: Leveraging of private financial resources to built the market
- D6: Convening dialogue with sector stakeholders incl. on environment and gender equality
- D7: Data to support evidence based solutions

5 Findings on impact

Below, we present our findings on evidence of impact from Sida's support to BGFZ. The findings are focusing on scaling, targeting and sustainability.

5.1 SCALE OF IMPACT - REACH AND COSTS

With the support from BGFZ, more than one million Zambians were provided access to basic renewable energy. This achievement can largely be attributed to the BGFZ supported interventions, since the vast majority of the customers were new in the market without real alternatives for energy supply.

Although the cost per connection was higher than first anticipated, compared to other Challenge Funds and Results Based Financing, the value for money in BGFZ has been reasonable. 194,000 energy service subscriptions were achieved during a period of six years, reaching more than the targeted one million Zambians (based on the assumption that one subscription reaches an average of 5.2 family members).¹⁶ The BGFZ subsidy cost per subscription ended at around USD 52 (compared to USD 38 as the expected amount).¹⁷ According to the Ex-post Evaluation (2024), this is a reasonable level. For other challenge funds, the unit connection price is higher. For example, the challenge fund Renewable Energy and Adaptation to Climate Technologies (REACT) stands at USD 98 per energy service subscription,¹⁸ although REACT is more targeted at start-ups and thus cannot directly be compared with BGFZ that targets a more mature stage of small and medium enterprises.¹⁹ It should however be noted that there were great variations across the four Energy Service Providers, and only one of the companies reached and overachieved its targets. Only due to the performance of this company, did the four the Energy Service Providers reach their joint target.

According to the 60 Decibel assessment, 85% of the customers acquired energy access for the first time and 86% indicated that they had no access to good alternatives for

¹⁶ This assumption is confirmed by the 60 Decibel assessment of BGFZ where an average of 6 household members were found.

¹⁷ Greencroft Economics (2024), Ex-post Evaluation of the Beyond the Grid Fund for Zambia (BGFZ), May 2024.

¹⁸ Ibid.

¹⁹ Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

energy before the support.²⁰ The global benchmarking of first access is 67% and good alternatives stand at 73%. This indicates, that BGFZ is serving a market with few other alternatives and is reaching customers who did not have access to energy before. Impact indicators for BGFZ are listed in Table 6.

Table 6. Impact indicators	
Indicator	Result 2021
Customers that reach energy access for the first time	85%
Customers that experienced an improvement in quality of life (due to electricity)	83%
Share of customers that live below USD 3.10 per person per day (poverty reach)	58%
Customers with no access to a good alternative	86%

Data sources: EDISON, verified by 60 Decibels. Data methodology: Phone-based (88%) and in-persons surveys (12%) of customers from all 4 Energy Service Providers (626 supported customers, min. 105 respondents per provider). 60dB energy benchmarking. The frequency of the data: Real-time upload of data by Energy Service Providers and verified by 60 Decibels in May 2021.

The linkages at the household level between access to energy and income generating activities are less evident. When it comes to the effects for the customers, only 9% of BGFZ's customers use their energy source for productive use.²¹ The corresponding figure for the best performing Energy Service Provider, SMG, which promotes mini-grids, was 18%.²² While SMG is in line with the figures reported in the global study 60 Decibel did in 2020, where it was found that 18% of customers reported use of energy for income-generating activities²³, the average across BGFZ Energy Service Providers was well below. Findings from the Midterm Evaluation of Sida's Power Africa Project indicated that the strong focus on solar home systems limited the potential for productive use. While this Midterm Evaluation did find examples of households generating income from charging services on their solar home systems, something that is also reported in the global 60 Decibel impact performance report, it is not fully reflected in the 60 Decibel BGFZ report.

Also, while the first assessment of impact in 2018 indicated that 25% of customers used their energy source for income generating activities, in the full impact assessment this result was considerably lower.²⁴ Thus, the higher-level impact on productive resources reflected in the ToC is only to a limited extent confirmed by the studies. In addition,

²⁰ 60 Decibels (2021), Beyond the Grid Fund Zambia. Standard Microgrid Insights.

²¹ 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

²² 60 Decibels (2021), Beyond the Grid Fund Zambia. Standard Microgrid Insights.

²³ 60 Decibels (2020), Why off-grid energy matters, An Impact performance Report.

²⁴ REEEP (2023), Final Report. Beyond the Grid Fund for Zambia (BGFZ), February 2016 to December 2022.

while it was a key assumption that customers would advance to a higher energy tier²⁵ this was not realised to the extent expected. According to the Ex-post Evaluation of BGFZ, most households are still using low tier systems and **there is limited evidence that BGFZ has been catalysing movement up the energy ladder**. The ESPs therefore also have struggled to sell higher tier systems as the low-income nature of the Zambian customer base has meant that low price and lower tier products were favoured.²⁶

There are solid data confirming impact on enhanced quality of life from energy connections, and quite substantially above the 60 Decibel benchmarking.²⁷ 83% reported enhanced quality of life from the BGFZ intervention which is far beyond the 50% from the 60 Decibel benchmarking. When asked about quality of life parameters, customers referred to financial savings on energy which has released funding for other expenditures. The solar home systems are provided at a lower cost than for instance candles and batteries, allowing families to better provide for other necessities.

Customers²⁸ who purchased the clean cooking stove indicated highest impact on quality of life with 91% indicating “very much improved quality of life”. A reduction in the expenditure for cooking fuel (pellets) used for cooking on clean cooking stoves replacing charcoal was mentioned as an important saving in this regard. This was confirmed from interviews with customers conducted as part of the Midterm Evaluation of Sida’s Power Africa Project (2020), where people understood the benefits of cooking on SupaMoto’s stoves and highlighted the fact that cooking took less time and that it was cleaner and cheaper to deal with the pellets compared to charcoal.

Nevertheless, several of these interviewed families continued to cook some dishes on charcoal and wood as this was the methods they were accustomed to. Furthermore, pellets were not always readily available with local providers, so families needed back-up strategies for cooking in case they were not available. Hence, the Midterm

²⁵ The Multi-Tier Framework (MTF) defines access to electricity according to a spectrum that ranges from Tier 0 (no access) to Tier 5 (full access). See more: Enel Green Power (2023), What are energy access tiers? <https://www.enelgreenpower.com/learninghub/qigawhat/search-articles/articles/2023/01/energy-access-tiers>

²⁶ Greencroft Economics (2024), Ex-post Evaluation of the Beyond the Grid Fund for Zambia (BGFZ), May 2024.

²⁷ 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

²⁸ According to 60 Decibels, more than 10,000 customers bought a clean cooking stove. The majority of the clean cooking stoves customers mentioned charcoal as their main cooking energy source prior to acquiring the cooking stoves.

Evaluation also showed that **while the potential impact on in particular women and children is considerable, changing behaviour is not done overnight and there are several challenges related to introducing clean cooking stoves.** This is backed up by several research and literature studies where it is found that many clean cooking stove programmes do not seem to have worked as intended. Despite positive results in the lab, several randomised evaluations point out that biomass cookstoves designed to reduce smoke exposure and/or increase fuel efficiency have not substantially improved health conditions. Many people did not want to buy or maintain the cookstoves, or did not use them enough, and continued to use their old stoves. In those cases, where researchers found most positive effects, including reductions in household fuel consumption and costs, the stoves had been better adapted to people's cooking habits.²⁹

There are indications that BGFZ has had a positive impact on health status due to energy access, although no hard evidence is provided on this aspect. While BGFZ customers do not refer directly to improved health, the introduction of cooking stoves and electricity instead of candles is likely to contribute to a better air quality in the home. Impact on health from solar home systems and cooking stoves has also been documented in other impact assessments, although great variations across companies exists and impact cannot be taken for granted.³⁰ In addition, some customers indicated that with the clean cooking stove they could provide three meals to their families a day, which is likely to have a positive effect on household's nutrition and thus health status in the longer run.

The assumption that energy will enhance education has not been fully confirmed. When it comes to education, there are only few highlights of this in the 60 Decibel report on BGFZ Energy Service Providers and it is not an impact mentioned by the majority of the respondents included in the customer survey. It is also not well documented in the impact performance report from 60 Decibel.³¹ While the Midterm Evaluation of Sida's Power Africa Project did find indications of positive impact on children's schools when a more reliable lightning is available, the Midterm Evaluation also found negative impacts in terms of girls having more hours available for household

²⁹ See e.g. Abdul Latif Jameel Poverty Action Lab (J-PAL). 2020. "Biomass cookstoves to reduce indoor air pollution and fuel use" J-PAL Policy Insights. Last modified October 2020. <https://doi.org/10.31485/pi.2265.2020>

Likewise, two baseline studies also seem to offer at least some evidence that the stoves work better in particular cases:

Poverty Pire In Southern Africa (Eppsa), E., & Study Team, P. (2021). Zambia Clean Cooking Study (ZCCS): Baseline report for implementing partner SupaMoto. <https://doi.org/10.17615/hjzf-gs31>

Poverty Pire In Southern Africa (Eppsa), E., & Study Team, P. (2021). "Zambia Clean Cooking Study (ZCCS): Baseline report for implementing partner VITALITE". <https://doi.org/10.17615/jatn-8h22>

³⁰ 60 Decibels (2020), Why off-grid energy matters, An Impact performance Report.

³¹ Ibid.

chores due to lightning, thus reducing leisure time and potentially study time. For families who managed to acquire televisions, children tended to get less sleep which could have a negative impact on children's health and education.³² On the other hand the 60 Decibel report indicated a stronger cohesion in the family when a television was introduced, thus impacting the families both positively and negatively.

Sida's support to the Energy Service Providers has allowed many of these companies to expand their portfolio, help them start to grow and employ more staff. The EDISON report that 1,853 part or full time staff have been employed by the Energy Service Providers, with a majority being part time employments (77%). According to the Final Report of BGFZ, the number of direct employments of the Energy Service Providers is however lower than the EDISON figures and it is unclear from where data has been derived. The Final Report reports an increase from 79 employees across the Energy Service Providers in July 2017 to 510 in December 2022. The employment rate of women has increased from 17% in 2017 to 40% in 2022 reflecting an enhanced focus over the period on recruiting women.³³ It should however be noted that the EDISON data did not gender-disaggregate jobs created which was a criticism of the Midterm Evaluation of Sida's Power Africa Project in 2020.³⁴ According to the Ex-post Evaluation, gender disaggregated data do exist, so somehow REEEP has managed to introduce gender disaggregated data in recent years which is a positive development. While there is an assumption in the ToC that employment will increase women's empowerment this is not investigated further in neither of the evaluation reports and thus continues to be an assumption.

5.2 IMPACT FOR SPECIFIC TARGET GROUPS

The BGFZ contribution has impacted around 5% of Zambians, however with great regional variations skewed towards regions close to Lusaka and with lower extreme poverty. Some of the provinces can be justified by low grid connection but the intervention areas seem rather randomly selected and not based on assessments of poverty-prone areas or lack of grid connection. With the contribution from BGFZ, above one million Zambians in peri-urban and rural Zambia have been able to access energy - and 85% of them for the first time – since 2017. While BGFZ has been implemented nation-wide, some provinces are less represented

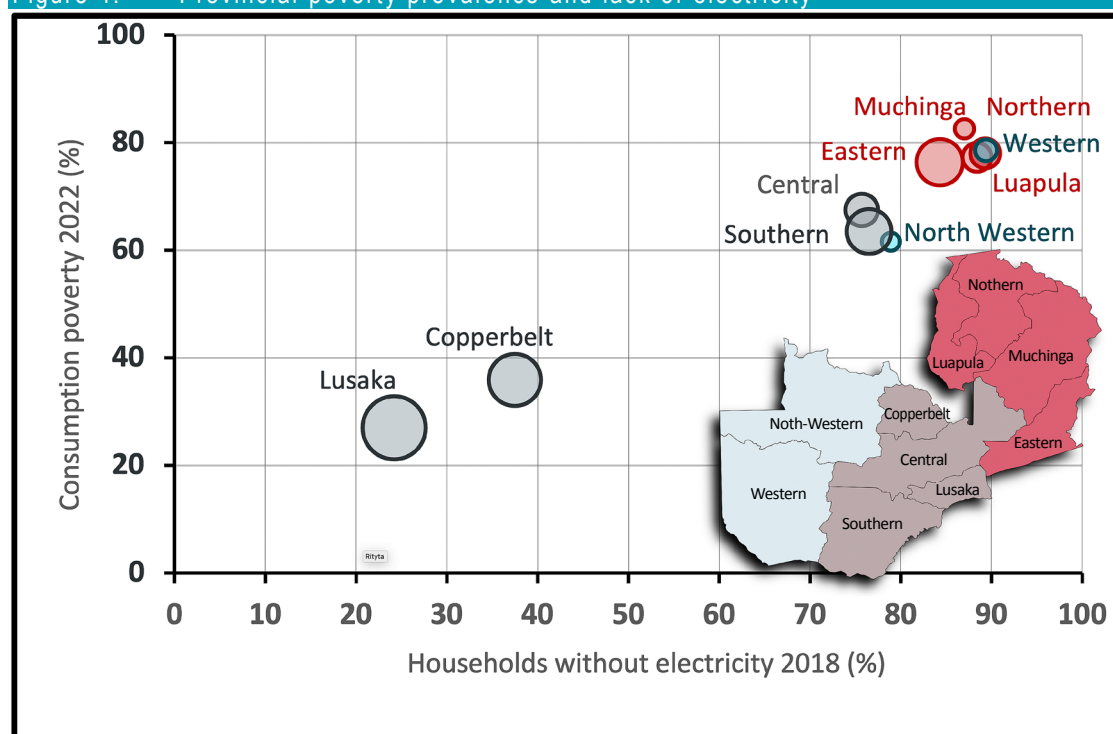
³² Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

³³ REEP (2023), Final Report. Beyond the Grid Fund for Zambia (BGFZ), February 2016 to December 2022.

³⁴ Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

than others. Copperbelt, Central, Eastern and Lusaka provinces have the best coverage whereas Western, North-Western, Luapula, Northern and Muchinga are less covered by the Energy Service Providers.³⁵

Figure 4. Provincial poverty prevalence and lack of electricity



The size of the bubble indicates the population size. Provinces in the west of the country are coloured blue, those in the center grey and east red.

Sources: Consumption poverty: LCMS 2022, figure 12.3. Electricity, DHS 2018.

It is noted, that according to the 2022 poverty census, the provinces best covered by BGFZ are the better off provinces and for instance Copperbelt and Lusaka are the only provinces where extreme poverty levels are below the national average. As shown in Figure 4, Copperbelt and Lusaka Provinces are also the provinces best connected to the grid (only around one third of all households were not connected in 2019, compared to much more than half in all other provinces).³⁶ Extreme poverty increased in Luapula Province and Muchinga Province from 2015 to 2022³⁷ and these provinces have,

³⁵ Fenix, VITALITE and SupaMoto had customers across all ten provinces and SMG in four of the ten provinces. The two main provinces for each Energy Service Provider were: Fenix (Copperbelt (18%) and Central (17%)); VITALITE (Central (15%) and Lusaka (14%)); SupaMoto (Lusaka (49%) and Eastern (11%); and SMG (Eastern (33%) and (Copperbelt (30%)). Source: 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

³⁶ World Bank, ESMAP, SREP (2019), Zambia Beyond Connections. Energy Access Diagnostic Report Based on the Multi-Tier Framework.

³⁷ Zambia Statistics Agency (2023), Highlights of the 2022 Poverty Assessment in Zambia.

respectively, less than 10% and 21% of households connected to the grid. Nevertheless, these are some of the provinces least covered by BGFZ. Eastern and Central Provinces, that are better covered by BGFZ, can be justified by their poor connection to the grid with, respectively, less than 8% and 18% of households.³⁸

While it is acknowledged that the extreme poor will often not be able to afford the energy supplies provided by BGFZ Energy Service Providers, there is evidence indicating that impact is larger at the earliest stages of off-grid energy penetration. According to the 60 Decibel impact performance report, solar lanterns provide the biggest impact on quality of life and customer satisfaction compared to any other energy source. The lanterns often substitute kerosene use and have a greater impact on families' health conditions.³⁹ Nevertheless, these products are not promoted by any of the Energy Service Providers.

From the benefiting households, 53% are located in rural areas, whereas 38% are in peri-urban areas. In addition, 9% are located in urban cities, although it has been a requirement from BGFZ not to focus on urban areas.⁴⁰ The Energy Service Provider SupaMoto is focusing on cooking stoves and has 49% of their customers in Lusaka, making Lusaka the region where SupaMoto by far has most of their customers. The Energy Service Provider Vitalite has Lusaka as the region with second most customers (14%). Thus, the principle of not including urban areas has not always been adhered to. While it is likely to make good commercial sense not to spread out too thinly, there seems to be need for stronger emphasis on reaching hard to reach areas in the provinces lagging behind and with higher poverty rates if the ambition continues to be a national scope and pro-poor. However, according to the Midterm Evaluation of Sida's Power Africa Project, the Energy Service Providers did not have any incentives to promote their product in hard to reach areas and thus it became a better business case to focus on more accessible areas.⁴¹

While BGFZ does reach poor people, customers are generally wealthier than the general population and there is room for improvement in terms of increasing customer diversity and reaching poor people living below USD 3.1 per day. As mentioned above, BGFZ companies are reaching customers who have accessed energy

³⁸ World Bank, ESMAP, SREP (2019), Zambia Beyond Connections. Energy Access Diagnostic Report Based on the Multi-Tier Framework.

³⁹ 60 Decibels (2020), Why off-grid energy matters, An Impact performance Report.

⁴⁰ 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

⁴¹ Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

for the first time and without access to good alternative energy sources. While this is an important indicator, the 60 Decibel assessment found that BGFZ customers are wealthier than the average national population and have a higher education level. 60% of the customers are living below the poverty line of USD 3.1 per day, however 74% of Zambians live below this threshold, thus BGFZ representation of customers is below the national average. The 60 Decibels measures inclusivity rates where above 1 means parity with national population, below 1 means underserving and above 1 means overserving the low-income customers. The average inclusivity rate of BGFZ was calculated at 0.81,⁴² indicating an underserving of low-income customers. The rate is higher still higher than the 60 Decibel benchmark of 0,57.

According to EDISON data, 30% of all primary customers were women.⁴³ This is largely confirmed by the 60 Decibel assessment that found that 83% are males from male-headed households. The typical customer is a 42 year old man with an average household size of six persons.⁴⁴ Thus, women represent less than one third of direct customers. This is somehow in accordance to the 2018 DHS, where 26.8% of HHs were female-headed (with little difference between rural and urban areas). While it is assumed that wives still benefit from purchases made by husbands, this is an assumption that stills remains to be tested.⁴⁵

There are no specific target group mentioned in the BGFZ documents besides the requirement to focus on rural and peri-urban areas. However, the definition of this is unclear and as discussed above urban customers also seem to be among the beneficiaries reached, although the majority are from rural areas.

5.3 SYSTEMIC IMPACT AND SUSTAINABILITY

While there is a positive correlation between growth and improved social impact results in the early stages of the Energy Service Providers' development, there are indications that social impact results decrease with maturity and growth of the Energy Service Providers in the longer run.⁴⁶ Also, evidence indicates that growth

⁴² 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

⁴³ REEP (2023), Final Report. Beyond the Grid Fund for Zambia (BGFZ), February 2016 to December 2022.

⁴⁴ 60 Decibels (2021), Beyond the Grid Fund Zambia. Energy Service Subscription Verification & Customer Insights.

⁴⁵ The number of female primary customers is explained as customers that were widows or not married, primarily widows. In the case where married, the husband would be the primary customer.

⁴⁶ 60 Decibels (2020), Why off-grid energy matters, An Impact performance Report.

is correlated with a stronger focus on higher-income markets.⁴⁷ There are indications that only a few companies improve over time in terms of poverty reach and the 60 Decibel report indicates that growth is instead associated with a focus on more expensive appliances and wealthier customers. The Midterm Evaluation of Sida's Power Africa Project also found that supporting the Energy Service Providers in scaling up is not sufficient to reach the poorest and there are indications that growth is correlated with stronger focus on higher-income markets.⁴⁸ Even with subsidies it is difficult to reach the poorest segments of clients, so without subsidies it is a challenging business case. Thus, the assumptions that the market will grow and gradually become more accessible to poorer segments is not confirmed by evidence. The experiences from BGFZ therefore also raises the issue that while Sida may be well placed to play a role in activating markets, subsidies may more suitably be channelled through larger government managed programmes (e.g. with support from the World Bank) to reach universal access.

The policy framework for renewable energy has been enhanced which will continue to impact the off-grid energy sector in Zambia. The establishment of the Off-grid Taskforce was instrumental in this regard and allowed for coordination across development partners and government agencies. While this approach has been scaled to other African countries through BGFA, the sustainability of the Taskforce in Zambia is questionable. The Taskforce anchored in the Ministry of Energy was instrumental in coordinating donors and government agencies and a number of policies to ease import of renewable energy was developed and adopted by the Taskforce. This included a customs handbook for importing solar home systems, development of mini-grid regulations, a new national energy policy in 2019, a gender action plan for the Ministry of Energy, and tax exemptions for lithium-ion batteries.⁴⁹ It is well noted that progress has been made in terms of mainstreaming gender into energy policies since at the time of the Midterm Evaluation of Sida's Power Africa Project (2019/2020) there had been no discussion of gender aspects in the Taskforce.⁵⁰

While policy achievements of the Taskforce have been impressive indicating a continued political will to develop the off-grid market (thus also confirming the assumption of the ToC), the Taskforce has not played the anticipated role in terms of

⁴⁷ Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

⁴⁸ Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

⁴⁹ REEP (2023), Final Report. Beyond the Grid Fund for Zambia (BGFZ), February 2016 to December 2022.

⁵⁰ Sida (2021), The Power Africa Project at Sida: Innovative investment mobilisation for fossil-free electrification. A Mid-Term Evaluation 2015-2019.

facilitating mobilisation of additional funding for the Energy Service Providers. Also, the sustainability is a challenge, and it is unlikely that the Taskforce will continue working without continued donor support for convening of meetings.⁵¹ While Sida continues to support the Taskforce under the BGFA, it is noted in the final evaluation of BGFZ that the pace of the Taskforce has reduced since one of the key actors ceased during the COVID-19 pandemic.⁵²

BGFZ has paved the way for further national scaling through significant leverage of additional funding as well as for regional expansion through BGFA and the Modern Cooking for Africa (MCFA) programmes,⁵³ together aiming to reach 12.6 million people within 10 countries. Compared to the around SEK 100 million that Sida has provided directly as grants to the four Energy Service Providers, by 2022 the target of mobilising four times as much had been overachieved: more than five times had been leveraged as debt, equity, grants etc.⁵⁴ This has allowed for further scaling of the interventions in Zambia.

This development is further impressing when taking into account that at the time when BGFZ was initiated, there was only around 4,000 customers and three operating Energy Service Providers in the Zambian market. Thus, Zambia was initially classified as a non-active market. A first task of BGFZ was therefore to activate a real market for off-grid services. With an active market in place, it also became possible to introduce public subsidies to reach poorer and harder to reach segments (see above).

Moreover, in 2019 a regional scaling of BGFZ took place with the formulation of BGFA, which includes Mozambique, Burkina Faso, Liberia and Uganda. BGFA is implemented by Nordic Environment Finance Corporation (NEFCO) and Renewable Energy and Energy Efficiency Partnership (REEEP). The total budget of BGFA is SEK 630 million with a contribution of around SEK 100 million per country strategy, except Zambia where the contribution is SEK 200 million.

⁵¹ REEP (2023), Final Report. Beyond the Grid Fund for Zambia (BGFZ), February 2016 to December 2022.

⁵² Greencroft Economics (2024), Ex-post Evaluation of the Beyond the Grid Fund for Zambia (BGFZ), May 2024.

⁵³ The MCFA aims to scale-up access to higher tier clean cooking solutions. The MCFA operates in the following countries: the Democratic Republic of the Congo, Kenya, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe. The goal of MCFA is to provide up to four million Africans with access to clean cooking solutions, improving overall health, reducing GHG emissions and increasing economic growth by 2027. This will be done by financially incentivising private companies active in the clean cooking sector and which are offering affordable, high-quality and energy-efficient clean cooking services, thereby accelerating the creation of a long-term sustainable market. MCFA is financially supported by Sweden, Norway and the European Union. See more about the MCFA programme and the funded projects on www.moderncooking.africa.

⁵⁴ Ex-post Evaluation of the Beyond the Grid Fund for Zambia (BGFZ), May 2024.

6 Concluding Remarks

Overall, we find that the impact and outreach from BGFZ has been impressive and studies conducted document a strong development impact from this contribution. Through BGFZ, the vast majority of the customers have been able to access energy products and services for the first time without having access to a good alternative. Most of the costumers express an enhanced quality of life due to the services obtained. While data and studies show that the majority of the customers are people living in poverty, there are at the same time indications that BGFZ have had issues with the targeting and to reach under-served people living in poverty to a sufficient extent. This also relates to gender aspects, where female costumers have been much fewer than male costumers. Gender of “costumers”, however, may not be the most suitable indicator, as it is mainly households headed by a widow that is classified as female customer. Thus, it might require a deeper analysis at household level as to the effects on gender.

While the geographic targeting has succeeded in reaching a nation-wide coverage in terms of provinces, this has not always led to reach of the poorest districts. This, however, need to be understood in view of the primary objective of this Contribution, related to first activating a market, then taking part of the risk for establishing and expanding the market. Mobilising additional capital was an important objective so as to balance between risk and who to be reached. If the objective had been to reach the poorest districts first, the boundaries should have been set that way. Thus, the Contribution needs to be seen as part of a process involving several logic steps, the first one being establishing a presence in the market, giving a requirement of targeting a majority in off-grid areas. This also makes good business sense, as on-grid customers would be less likely to pay unless when there are power cuts. The following steps to reach the poorest and most vulnerable build further on an activated market and presence of several Energy Service Providers, through which public subsidies could flow in a competitive way.

It is noted that focus has not been entirely on rural and peri-urban areas, as originally envisaged, but has also included costumers from urban areas. It is also found that the focus on productive use of the energy products has not been high, and BGFZ has not yet fulfilled the potentials for economic and employment effects to any larger extent. Thus, while BGFZ overall has demonstrated an innovative and successful model for market penetration of unserved poor costumers for energy products and services, including cooking stoves, the distribution model has had some challenges and a viable business model for how to reach the “last mile” is still to be developed. In reaching and stimulating development in areas which are remote or where poverty is high, purely market-based solutions may not suffice. Here, subsidies will most likely be required.

Beyond the Grid Fund Zambia was created to expand affordable renewable energy for energy poor people living outside the national electricity grid. This was to be achieved by incentivising private sector companies' to invest in off-grid energy generation, distribution and service delivery, with the goal to reach more than one million Zambians living in peri-urban and rural areas.

Positives: We find that the BGFZ had an impressive impact and outreach, reaching more than one million people. Most of them were new customers without previous access to energy products, and who lacked a good alternative. Access to basic energy services has contributed to enhanced quality of life for the costumers and their families.

Potential shortcomings: However, there is an absence of real evidence on health and education impacts, and the programs focus on productive use of the energy products has not yielded much. BGFZ has also faced challenges in effectively targeting and reaching the poorest and most underserved groups, even though the majority of its customers are people living in poverty.



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