



**Business Models**  
**for Sustainable Energy of Rural Communities Project in**  
**Chikwawa and Nsanje Districts, Malawi**

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Developed by Hivos on behalf of SE4RC partners in Malawi



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## 1 Executive Summary

Sustainable Energy for Rural Communities (SE4RC) is a European Union Sponsored project being implemented in Zimbabwe and Malawi by a consortium of organisations. The project aims to provide access to renewable energy to remote areas, which are located away from the national grids of the two countries. In Malawi, the project is in two south Malawi Districts of Chikwawa and Nsanje, and being implemented there by Environment Africa, Churches in Action Relief and Development (CARD), Hivos and Practical Action.

Hivos was tasked to develop business models for the Malawi project site. Although a detailed feasibility study was done earlier, certain project shifts necessitated a In consideration of project operation environment. A market survey was thus carried out in sample project sites in order to inform the Governance Systems and Financial modelling.

The commercial assessment for both the solar energy kiosks and minigrids for all the sites indicates that the business ventures would only be viable in the long term. This was evidenced by the Negative Net Present Values which were obtained after discounting the net cash flows for a period of five years. A Positive Net Present Value was obtained after discounting the net cashflows for 20 years. Whilst the economic viability of the project can be achieved only after 20 years, the social and environmental impacts of the project are well pronounced even in the short-term period of implementing the project. The financial analysis revealed that tariff rate and number of beneficiaries are key the determinant of the commercial viability of the project. It should also be noted that the commercial or economic viability of the project only considered direct income from selling power and not indirect revenue of the project e.g. the increase in income from irrigated crops and new businesses in the project sites.

Though the sites show huge commercial viability, the study revealed the following as some of the challenges that could compromise the commercial viability of the businesses:

- Lack of technical skills in business management;
- Lack of knowledge of solar products by operators;
- Low income levels of most households;
- Over reliance on agriculture as the main source of income. Fluctuation of agricultural prices pose a huge risk to farmers this is coupled with the absence of structured markets.
- The two districts are prone to drought and floods, which have an impact on their incomes.

- Limited number of businesses that could be potential customers for the minigrid and solar energy kiosks and
- Competition from cheap and low quality solar products.

In order to achieve sustainability of the businesses, the following should be done:

- Capacity building of project beneficiaries in business management, leadership, crop production and collective marketing.
- Facilitate partnership with key stakeholders to improve access to solar products, markets for agricultural produce and accessibility to farm inputs and finance. For example partnership with Solar Aid help the project reach more beneficiaries within a short period of time.
- Raise awareness about the benefits of a range of solar products.
- Increase the capacity of the minigrids to reach more people and cater for maize and rice mills. The current capacity of 30kwp appears not to suffice for private miller connection to the minigrids, save for custom energy efficient mills.
- There will be need to invest more into the distribution network so that distant households are reached and connected to the solar minigrid.

## 2 Introduction

### 2.1 Background

Sustainable Energy for Rural Communities (SE4RC) is a European Union Sponsored project being implemented in Zimbabwe and Malawi by a consortium of organisations, viz: Hivos, Environment Africa, Dabani Trust, Practical Action and Churches in Action Relief and Development (CARD) and SNV. The project aims to provide access to renewable energy to remote areas, which are located away from the national grids of the two countries. In Malawi, the project is in two southern most districts of Chikwawa and Nsanje, and hosted in the communities by Environment Africa in Chikwawa, and Churches in Action Relief and Development (CARD) in Nsanje, with Hivos and Practical Action offering floating technical implementation roles.

The project seeks to provide access to renewable solar energy to all remote and poor areas away from the national grid. The project is set to enhance water pumping for irrigation, electricity for lighting homes and public institutions, small businesses, agricultural enterprises, and is set to benefit more than 30,000 beneficiaries in both Zimbabwe and Malawi, thereby improving economic, social, technological and environmental resources and standard of living. The project also intends to create an enabling environment where both private and public actors are engaged in the rural electrification market.

The feasibility study conducted in 2014 defined the plans to construct 6 Energy kiosks and 4 solar mini grids in Nsanje and Chikwawa. From the consortium, CARD will oversee the installation of 4 Kiosks and 2 Solar mini grids in Nsanje. Environment Africa will oversee 2 Minigrids and 2 Solar Kiosks in Chikwawa. The feasibility study further clarified the assumptions made for the project, energy demand for the beneficiaries for lighting and household appliances like Radio, TV and mobile phone.

The feasibility study saw the relocation of sites due to flood damage and extension costs of the grid. The replacement sites were Nyamvuu and Chimombo. These sites were chosen due to isolation from national grid line, grid extension to previously identified sites and poorly established irrigation schemes.

This document is designed to provide specific insights into the economic environment in which Community Energy Service Committees (CESCOs), Energy Kiosks and Irrigation Schemes will be operating in Nsanje and Chikwawa, as well as to outline financial models that will aid viability of the SE4RC and enhance private sector investment in energy service provision. It aims to create oversight that is useful for new small businesses, agricultural enterprises and provide detailed information on the local markets for renewable energy.

The areas of specific interest include;

- Governance of the community energy service delivery under the project through Minigrids and Energy Kiosks Energy Kiosks and mini grids to facilitate an enabling environment for service delivery;
- Developing appropriate business models for CESCOs, Energy Kiosks and Agro Enterprises;
- Provision of Business Management Training and other backstopping services;
- Productive end use of electricity for 30,000 men and women, as well as business linkages to enhance financial viability of enterprises, and
- Public and private energy stakeholder engagement in joint learning and activities that enable access to energy in Malawi and Zimbabwe.

## 2.2 Rationale

The rationale used during the development of the business models as presented in this document has been guided by the understanding that the models defined herein will act as overall framework guiding delivery of off-grid rural electrification in Chikwawa and Nsanje Districts. These models therefore do not guide the choice of technology, as that was pretty defined in the project proposal, except on the shifts in technology from the initial thinking. It does however guide business aspects to the community power initiatives by defining **Governance and Institutional setup** for the mini-grids and Energy kiosks activated by the project and **Financial Modelling for the Minigrids and Kiosks. Roles of various stakeholders** as well as guiding elements related to **policy and regulatory frameworks** on energy provision to the target community are however not included in this writeup as at now.

Business models in the power sector takes many forms. In the private sector, the prime focus being pro-profit while in the public sector, the focus is on service delivery. SE4RC is a community Development project, granted by public funds from the European Union, and meant to benefit the public directly. At the same time, it is generally accepted that where users are able to pay for the services, the private sector approach to energy provision works better in ensuring not only quality, but also sustainability of service. The dilemma faced with the community power provision such as is the case under SE4RC project is that it is aimed at providing power to communities on the last mile, often not attractive target business areas for the traditional private sector. It requires deliberate public service initiative to serve such a population. It is for this reason that the business models proposed herein:

- are skewed towards optimising service delivery, protection of community interests, and aimed at achieving betterment of livelihoods.
- explore sustainability of current investment, hence pro-profit considerations, in order to achieve expansion of power systems/Kiosk business for more community members to be serviced as well as attract and sustain the interest of the private sector and development of renewable energy entrepreneurship.

This is therefore a documentation of business choices made that make up a guiding framework to SE4RC project staff in Malawi and the communities they serve with regard to Technological options for energy delivery, Governance models, and Financial models.

### 3 Technology and sites

SE4RC project aims at enhancing access to renewable energy in the target districts through provision of solar power based technologies to the communities as detailed below.

#### 3.1 Solar Power Plant and Minigrids

Solar power plants shall be supplied as presented in the table 1 below. Electricity shall be delivered to end users through a minigrids linked to each power plant. The primary consumers of the power from the minigrid will be the productive end users (Irrigation Schemes). Social services (Schools and Health Clinics) will also be supplied.

**Table 1: Solar Power Plants with Minigrids**

District	Site Name	Size of Power Plant (kWp)	User base
Nsanje	Nyamvuu	30	Irrigation Scheme, Under 5 Clinic
	Chimombo	15	Irrigation Scheme, potential maize mill, and Under 5 Clinic (subject to renovation by host ministry)
Chikwawa	Mwalija	15	Irrigation Scheme, Under 5 Clinic
	Oleole	15	Irrigation, School and (potentially) Households
<b>Total</b>		<b>75</b>	

#### 3.2 Energy Kiosks

An Energy Kiosk is a booth for access to energy through charging whatever vessel a customer may have or access that can enable him/her to take the energy home or use it on site. The Kiosk shall also sell products that enables them access renewable energy. The Kiosks will be stocking and offering several products and services including:

- Charging services: batteries, radios, phones, radios, batteries and torches
- Renting out charged batteries
- Renting out and selling solar lanterns
- Selling rechargeable batteries
- Selling Solar panels
- Selling Wiring materials, especially at grid connected Kiosks/ Energy Service centres.
- Communication technology (photocopying, email, Computer services etc)
- Video shows,
- Shaving/barber shops, Saloons, Burning and selling of DVDs, for printing and photo copying.
- Refrigeration

The following table lists sites for the energy kiosks:

**Table 2: Kiosk sites in the project**

<b>District</b>	<b>Site</b>	<b>GPS Coordinate</b>
Chikwawa	Oleole	-16.298058, 35.027477
Chikwawa	Mwalija	-15.992197, 34.781013
Nsanje	Mmelo	-16.559425, 35.000248
Nsanje	Nguluwe	-16.576033, 35.029217
Nsanje	Nyamvuu (Nkotamo)	-16.597168, 35.043058
Nsanje	Nyanthana (Mulukwa)	-16.600483, 35.071367

## 4 Understanding the Business Model and its Viability

### 4.1 Solar Minigrids

#### 4.1.1 Profit side of the Solar Minigrids

##### **a) Value proposition**

All the areas targeted by the project are currently without access to power. The value of the minigrids is in the supply of reliable electrical connection and solar products to farmers in the irrigation schemes and the community at large. The provision of electricity to community will spur economic development of the areas, which are currently underdeveloped. It is envisaged that the installation of a mini grid to generate power will attract investment or businesses, which will create employment opportunities, improve infrastructure and agricultural productivity. Improved agricultural productivity will contribute to food security and household nutrition. It will also help to improve literacy levels amongst school going children, as children will have more study time. It is also envisaged that it will improve health service delivery, natural resource management, as households will now start to use power from the mini grid for lighting and heating instead of fuel wood and charcoal. Floodlights inside irrigation scheme will not only aid security of the crop, but also enable longer working hours in the field, be it for harvesting or tending to the crop.

Through connection to the minigrid, for those that can afford connection costs, households will have access to modern communication including television, and radios and will be able to use modern appliances in the households. The introduction of minigrid will help women to stop travelling long distances to access grooming services e.g. saloon and barbershops thereby allowing women to spend more time on productive activities.

##### **b) Customer segments**

Potential customers for the minigrid have been categorized into three classes namely:

1. Productive users where power from the minigrid will be used mainly for water pumping water. Other potential productive uses include but not limited to maize mills, sewing machines and welding machines, especially if the power is upscaled in time.
2. Domestic users who will use the power from the min grid for lighting, cooling, TV, radio and communication.
3. Social users e.g. school and health posts.

## The case of Oleole

For example, there are 3,721 households in Oleole who might be reached by the project directly and indirectly. Most households anticipate using electricity for lighting, fan and radio. The schools through school committees anticipate connecting the minigrid to the four teacher houses. Oleole has a market nearby that hosts a mobile market every Thursday. Mobile businesses such as barbershops, restaurants, and video shows and cold drinks selling points re-locate to the area on the market day. Oleole has also a shelter hall, Savara hall for flood victims. The shelter has a huge potential for businesses such as computer centre and restaurant that would need energy from the minigrid. At the moment, the hall does not have electricity for lighting.

In the project area, most businesses are owned by youths who are innovative and creative. Focus Group discussions highlighted video shows as one of the common businesses that attract youths. Multiple businesses were suggested for electricity usage such as saloons, maize and rice mills as some of them.



Error! Not a valid bookmark self-reference. Savara Hall, which also serves as an evacuation centre in times of floods.

### **c) Customer relationships**

In order to maintain good customer relationships for the solar minigrid and solar energy kiosks, the following will be done:

- Provision of reliable energy services to the irrigation schemes, households and small businesses.
- The committees (CESCO) will enter into service agreements for all services offered to Irrigation schemes.
- Regular meetings will be held with communities and traditional leaders to garner their support for the project and encourage payment for services.
- The community will be empowered to own the business through capacity building in business management and maintenance of solar grids and other products such as Lamps and batteries.
- For grid connected Kiosks, kiosk operators will be the customers of the CESCO, while themselves will be offering Flexible payment arrangements for energy services and solar products as agreed with communities. For example, some solar products will be sold on credit after depositing a non-refundable fee and payments will be built in the fee for recharging the items . Communities will be entitled to eventually own a solar product after renting and recharging it for a specified period as one way of creating customer loyalty.
- Trainings will be held for management teams of the minigrid and irrigation scheme to leadership and governance, financial management and business management in order to improve service delivery by the energy suppliers, and enhance productive use .
- Affordable tariff rates will be set through participatory or consultative means with key stakeholders to ensure buy-in from energy end users.
- Good financial records will be kept for transparency and accountability back to the annual general meeting of customers.

#### **d) Distribution channels**

There are local and urban-based suppliers of solar products in the project area. The project will however introduce the project beneficiaries to high quality solar products and facilitate the establishment of good business working relationships amongst them. The project only work with prequalified suppliers of quality and affordable products. In order to reach more households with solar products, the project will work with other stakeholders including NGOs, churches and traditional leaders in sensitising the community on the advantages of accessing certified and warrantied products through the project as opposed to cheap but unreliable counterfeit products.

Power from the mini grids will be distributed primarily to Irrigation schemes and social service points. However, most potential household consumers express willingness to pay for the cost of connections at an average cost was **MK7, 223 (US\$ 10.07)** .

#### **e) Profit structure**

The main revenue source for the mini grids will be the irrigation schemes and individual households for members of the scheme. The study revealed that members would be willing to pay a lump sum for energy consumed after selling their harvest. This will be possible if individual members of the irrigation scheme will put a committee in place to oversee energy usage and where marketing of produce will be collectively done.

#### **4.1.2 Cost side of the Solar Minigrids**

##### **a) Key partners**

The sustainability of the mini grid business will depend on the formation of long-term key partnerships with relevant stakeholders. The Market Assessment revealed the following as some of the potential partners for the solar minigrid in the project area:

- The Ministry of Education through the various rural schools;
- Ministry of Agriculture, Irrigation and Water Development through the various project in the agriculture sector,
- Traditional Leaders,
- Ministry of Health,
- Ministry of Energy and Mining,
- Malawi Regulatory Authority,
- The Ministry of Local Government especially at the District,
- Private sector e.g. suppliers of solar products, irrigation and electrical equipments.
- ESCOM as a potential customer for excess energy produced by the minigrid and at the same time a potential competitor. ESCOM is critical on setting tariffs and will provide an opportunity for scaling the uptake of the mini grid technology.
- NGOs such as Universal Purpose and Goal Malawi implementing various developmental projects in Chikwawa and Nsanje. Partnership with them will help to achieve greater impacts.

In some sites such as Nyamvuu, the Irrigation committee is looking to partner with Micro-finance institutions like FINCA, MUSCO for financial support. Community based organisations like Cooperatives, will be approached for collaboration on selling of crops.

## **b) Key activities**

Some of the key activities to be performed include the following:

- I. **Community sensitisation** which will include holding of meetings with communities and traditional leaders and conducting demonstrations on how solar products works and especially the value they create.
- II. **Capacity building:** This shall involve provision of training for the mini grid managers and on sourcing of materials and maintenance of the mini grid.
- III. Commissioning of the mini grid involving all the key stakeholders to garner their support and at the same time public awareness.
- IV. Formally agreeing the pricing and payment modes for energy consumed with customers with regulators and project beneficiaries. The pricing structure will take into account the sustainability of the project. Energy usage will be monitored for each block in the irrigation scheme on a monthly basis. The same will happen with other customers. Electricity bills will be prepared on a monthly basis based on individual usage.
- V. Promotional and demonstration activities will be conducted to raise public awareness of the benefits of using solar product with an aim to increase the number of customers for the min grid.
- VI. Financial records will be maintained to assess the profitability of the whole investment. Financial records will also help to instil a sense of transparency and accountability amongst members.
- VII. Surveys will be carried out regularly to assess the social, economic and environmental impacts of the project. Surveys will also be conducted to assess customer satisfaction levels in respect to the solar products and services provided by the project.
- VIII. Sourcing of loans, maintenance of the irrigation structures and minigrids equipment.
- IX. Conducting of marketing research for commodities to identify profitable markets for irrigated crops.
- X. Insurance of solar products against unforeseen circumstances.

## **c) Key resources**

The minigrids will be run on behalf of the communities by the CESCO.. Human resource is required for Operation and Maintenance as well as financial resources to pay the

employees. An office block/power house will be required to house maintenance materials and other assets for the minigrid. Stationery will be required for keeping records of energy consumed, payments made and receipts. Watchmen will be employed to secure project assets.

## 4.2 Solar Energy Kiosk

### 4.2.1 Profit side of Solar Energy Kiosk

#### a) Value proposition

The majority of households do not have access to power in the project sites. Furthermore, the solar mini grids to be established do not have the capacity to provide power to all the households. Therefore, the establishment of Solar Energy Kiosks will improve access to power for members of the community who will not be connected to the minigrid.

Improving access to power through solar energy kiosk will have social, economic and environmental benefits such as improving the quality of education and health of the project beneficiaries. It will also contribute to the reduction in deforestation as, some households use firewood for lighting as well, in addition to cooking. Firewood is associated with respiratory diseases, which is a health risk. Through use of solar energy from kiosks, there will be a reduction in carbon emission.

It is anticipated that 3,700 households in Oleole and 1,150 in Nyamvuu, and about 1,000 from each of the other 4 Kiosk sites will benefit from the kiosk through charging of lanterns, batteries and phone and printing services. The kiosks will also stock solar products thereby improving community access to clean and renewable energy.

Schools anticipate that they will acquire solar lanterns for students to study at night. Schools want to engage the school committee to mobilise resources for students to have access to solar lanterns for studying.

#### b) Customer segments

The main customers for the solar energy kiosk will be individual households, businesses and government or public institutions such as health posts, primary schools and police. For example, Dande primary school will be one of the beneficiaries of the solar energy kiosk in Nyamvuu and Oleole Primary School in Oleole. The small businesses will engage the kiosk to acquire solar products for lighting, video shows and for providing computer services such as printing and photocopying.

#### c) Customer relationships

Solar Energy Kiosks will forge long-term relationships with suppliers, customers, government and regulators. This will be done through meetings, customer satisfaction surveys and collaboration on project activities including capacity building or training.

Solar Energy Kiosk will provide training to its customers on how to use and resolve simple faulty problems. Solar energy kiosks will put in place quality management or control measures to ensure that customers maximise their benefits while complying with the necessary regulatory framework. Warrants will be provided to customers for services and goods delivered.

Incentive programmes will be put in place for loyal customers e.g. the possibility to own solar equipment after consistent or continuous usage of the equipment for more than 2 years.

The committee in-charge of the kiosk will establish payment plans for the solar lanterns during renting or purchasing through a loan. The contracts for renting of solar products will have a clause for a fee in case of theft, breakage and loss of goods.

The committee will be empowered in financial management, entrepreneurship, and strategic management, group dynamics and market research.

To enhance better customer relationships, flexible and easy payment methods will be introduced. For example, rechargeable lanterns will be offered for sale through a deposit, and then subsequent payments are built in the recharge fee till the lamp value is recovered.

As part of promotion, loyal customers will be offered free or non-chargeable days to rent and or charge their solar products at the kiosk.

#### **d) Distribution channels**

Equipment and materials for the kiosks will be sourced from only reliable suppliers of goods and services, and only “lighting Africa” approved materials will be accessed through the project.

The kiosk operators will be responsible for engaging with potential customers that patronise the mobile markets that take place around some sites such as Oleole and Nyamvuu. In-addition, the kiosk placed at the trading centre will have access to more than 6000 customers on market day, which is slightly higher than the customers for the minigrid. Customers on the market day come as far as 50 Kilometres away from the trading centre.

In addition, the Kiosk operators will be engaged in special community events hosted by Area Development Committees (ADC), Traditional leaders and Village Development Committees (VDC), to pitch kiosk products and services.

The kiosk operators will be engaged with demonstration campaigns of solar products and services found at the kiosk. These campaigns will be conducted during Village Development Committee meetings, farmer cooperatives meetings and other local level meetings including agricultural field days. In-addition to products, location of the energy centre will be advertised during these meetings and market days.

The kiosk will also have a long-term relationship with suppliers to ensure consistent supply of high quality products.

#### **e) Profit structure**

Profit for the kiosk will be generated mainly from provision of charging services of solar products, printing, television shows, provision of computer lessons, and Internet services. Depending on demand, resources and business development, the Solar Energy Kiosks plan to engage in trading and renting out of solar products.

The availability of solar equipment to meet the demand and distance from the nearest power grid has a significant impact on the profitability of the energy kiosk. It is anticipated that the further the distance to the nearest power grid the higher the profit that could be realised. Profit will influence by the ability of the individual households to generate enough income from their agricultural activities.

The operators will cut some of the transportation costs by selling within the communities. In-addition they will engage community members that travel long distances like priests, VDC and Chiefs ward to display posters and fliers for services offered at the Kiosk.

### **4.2.2 Cost side of Solar Energy Kiosks**

#### **a) Key partners**

Solar aid, Endev and hardware shops are some of the potential key partners for the energy centre. These partners could provide solar products which could later be sold, rented or loaned to customers. Such partnership will require a Memorandum of Understanding (MOU) that will spelt out the type of products to be provided, basis of commission and provision of backstopping services such as marketing, training and maintenance services. As with the minigrid, the same partners for the minigrid are applicable with the Solar Energy Kiosk.

#### **b) Key activities**

The key activities will include assembling and continuous customising of solar products. Kiosk operators will perform product demonstrations for customers and will also train and manage outsourced sales agents that will assist in selling products to surrounding areas where need arises.

Kiosk operators will ensure that maintenance of equipment in the kiosk is done regularly to improve the lifespan of the equipment.

Promotional activities will be conducted to raise awareness about the benefits of the various solar products. Promotion will be done through posters and fliers, community meetings and product demonstrations and community radios.

### **c) Key resources**

The main resources for the Kiosks will be :

- Lanterns, battery and phone chargers
- Printers, photocopiers and computers
- refrigerator
- SIM Cards for phone
- Lamination machine
- Human resources e.g. full time staff
- Financial resources for paying salaries, marketing, transport and communication
- Occasional human resources for operation and maintenance of Solar Products
- Kiosk Housing.

### **d) Cost structure**

The main costs for the kiosk will be salaries for operators, communication, community mobilisation, transport and repairs and maintenance costs of the solar products.

Cost reduction strategies will be put in place to avoid incurring unnecessary costs. Customers will be trained on how to use and manage solar products rented out to them to reduce damages. A budget will be prepared for each kiosk, which will be monitored regularly to avoid cost overruns. Only valid expenditures will be incurred. For this to be possible, the management team will be trained in budgeting and cost control strategies.

Materials and services will be sourced from suppliers offering the highest quality of products at affordable prices. This will be achieved by having proper procurement procedures in place. Kiosk operators will be trained on procurement. Where necessary, bulk purchase of goods will be encouraged in order to enjoy discounts or economies of scale while at the same time, the business will put in place measures to control loss of stock from obsolescence. Refer to Economic **and Financial Viability Section 5** of this report for detailed financial information.

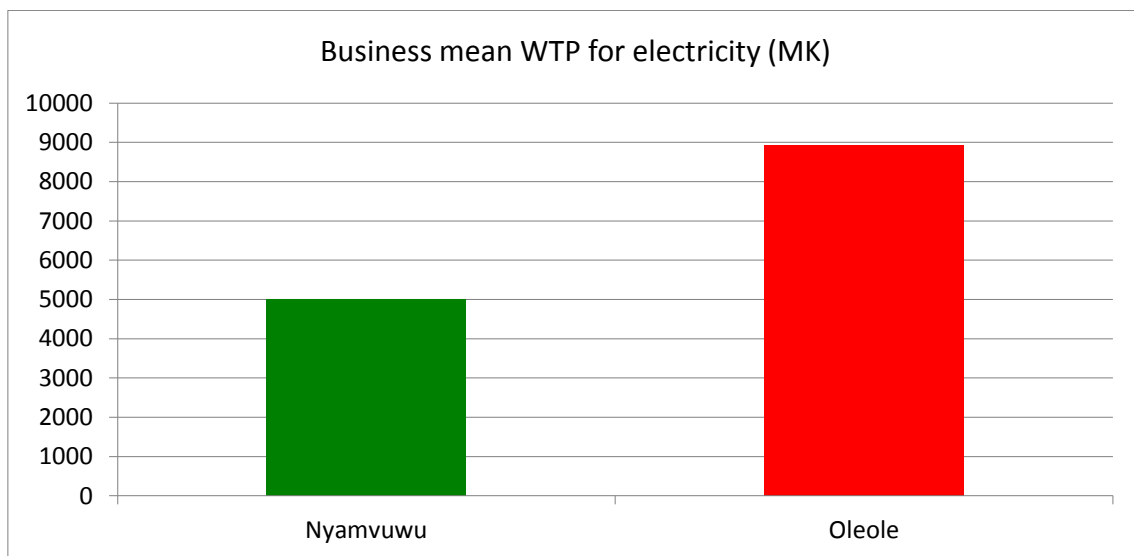
### 4.3 Market environment

#### 4.3.1 Willingness to Pay (WTP) for renewable energy

The market assessment revealed that respondents were willing to pay MK7,223 (US\$10.07) for electricity connection. The study further revealed that all the 11 small businesses that were interviewed were willing to pay for electricity connection if access was provided. The small businesses that were sampled included butchery, saloon, restaurants, video shows, groceries and maize mill.

The mean willingness for the businesses to pay for connection was MK16, 363.64 (US\$22.82) with a median of MK10, 000 (US\$13.94). Unlike farmers, who preferred to pay after harvest period, the small businesses indicated their willingness to pay on a monthly basis. The overall mean monthly willingness to pay for energy for Nyamvuu and Oleole was MK5, 000 (US\$6.97) and MK8, 928 (US\$12.45) respectively.

**Figure 1** below represents willingness to pay per month for two sampled sites.



**Figure 1 Business willingness to pay for Electricity**

Below is a table with monthly willingness to pay information

Location	Total willingness to pay for electricity per month				
	Mean		Std		N
	MWK	US\$ Equivalent	MWK	US\$ Equivalent	
Nyamvuu	5000	6.97	2449.490	34.16	4

Oleole	8928	12.45	8115.975	11.32	7
Total	7500	10.46	6726.812	9.38	11

**Table 3: Summary of Monthly Willingness to Pay**

### 4.3.2 Market size, potential market

#### 1. Potential productive use of energy

The market size assessment focused on current and potential use of energy since this will provide easy access to clean and renewable energy for small businesses, both existing and upcoming to grow and reap the benefits of extended working hours, higher productivity for increased income, product preservation and cooling and enhanced working conditions. The questions asked during data collection embraced existing electricity demanding businesses in the areas for assessing the already existing competition in-order to determine viability of the businesses. The FDGs and individual business interviews revealed that there would be emergence of a number of businesses due to the availability of renewable energy. The only limitation will be the capacity of the minigrid. A list of such businesses has been presented in the box below.

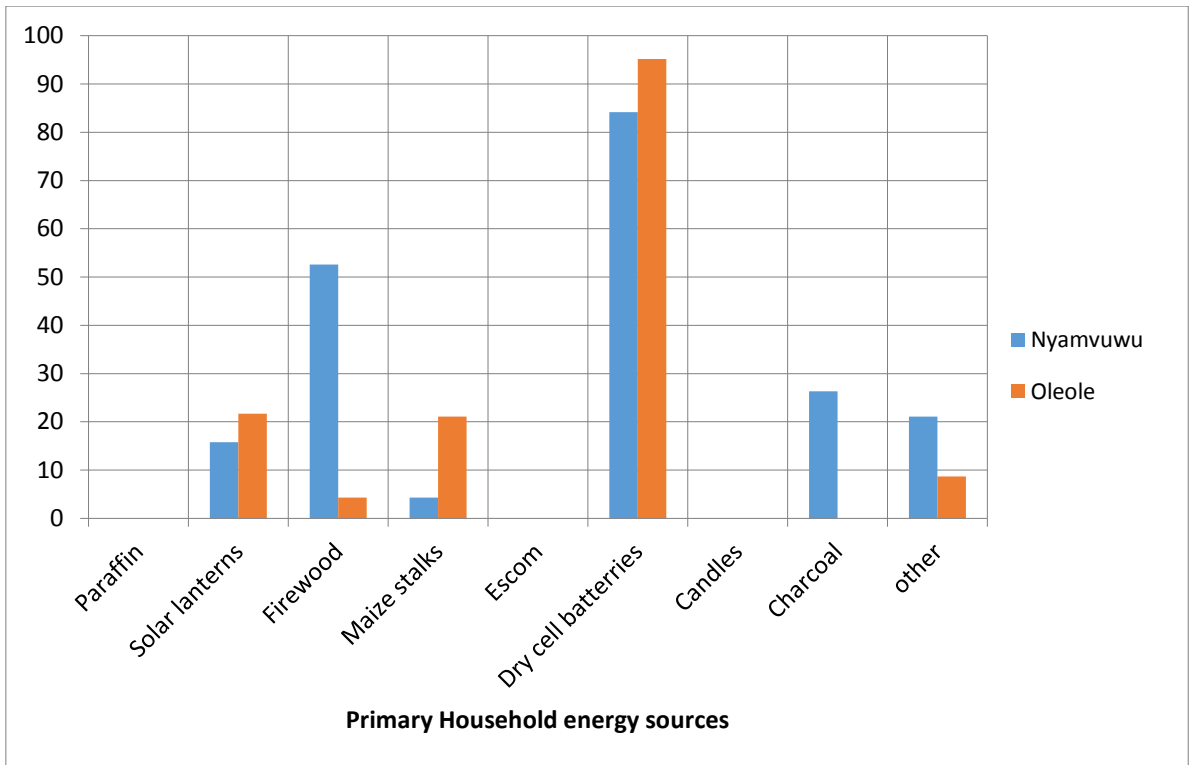
***Productive businesses***

*Grocery for cold beverages, maize and rice mill, video shows, battery charging, water pumping, saloon, restaurants, welders, Mobile phone charging, Internet café, and grocery lighting*

#### 2. Household energy usage

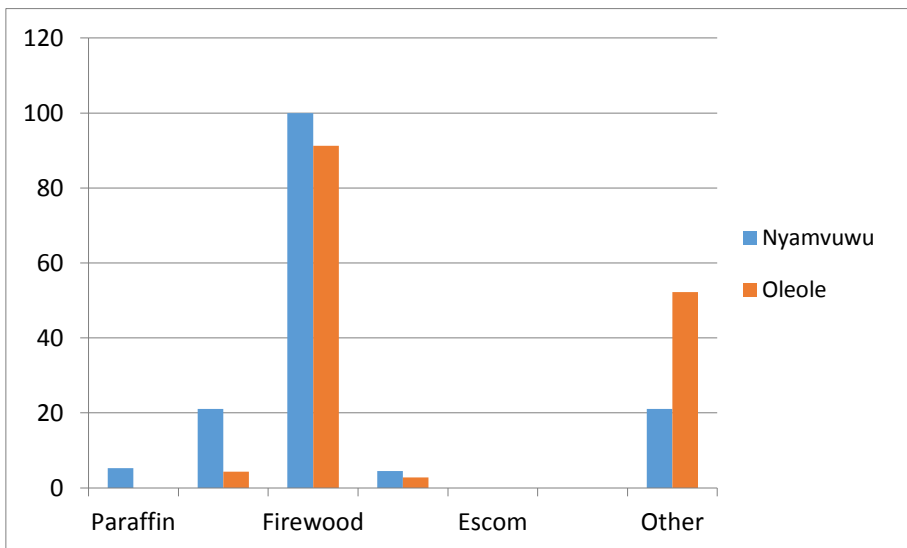
The study revealed that households in use dry cell batteries, solar lanterns, firewood, maize stalks and other materials for lighting. It further revealed that dry cell batteries were the highest energy source for lighting with, 95.2% in Oleole and 84.2% in Nyamvuu which could be attributed to availability and cost of the batteries than the other energy sources.

**Figure 2** below represents household energy use for two sites that were sampled.



**Figure 2 Primary Energy Sources for Lighting**

On the other hand, the study revealed that firewood was the major source of energy for cooking. Firewood is accessible in nearby forests for free as compared to other sources that need to be purchased. **Figure 3** presents results of the primary energy sources for cooking in the Nyamvuu and Oleole.



**Figure 3: Primary Energy Source for Cooking**

### 3. Energy consumption

The study revealed that rural households are known to have limited access to modern energy at a reasonable price and that they face high-energy expenditure on the traditional fuels. **Table 4** presents the mean monthly energy expenditure for Nyamvuu and Oleole households.

Type	Measure	Nyamvuu			Oleole		
		Quantity	Hrs of usage	Price (MK)	Quantity	Hrs of usage	Price (MK)
Paraffin	Litres	-	-	-	-	-	-
Candles	Number of candles	-	-	-	-	-	-
Firewood	Number of bundles	6.58	170	5,236	7	153	3,877
Solar lanterns	Charge time	1.63hr	26.67	68	4.35hr	48.33	252.37
Dry cell batteries	Number of batteries	4	57.5	1,824	6	140	3,053

**Table 4: Monthly Energy Expenditure**

## 4.4 Technical Viability

### 4.4.1 Professional expertise

During the focus group discussions with CESCOs it was noted that most of them lack the knowledge about their roles and had no skills in sales and marketing, customer service, financial record keeping, operation and maintenance of solar products and minigrids. For example, it was noted in Nyamvuu that CESCO operators were elected from Lyton Village in Nsanje without regard to their level of technical skills. The study therefore has identified the lack of technical ability by operators as the major threat to the commercial viability of the kiosk and minigrid businesses and the project plans to deal with this prior to handover of systems to communities.

### 4.4.2 Products

During the focus group discussions in Oleole and Nyamvuu, it was noted that off-grid lanterns are emerging key alternatives in meeting the basic lighting needs. The focus group discussions further revealed that to have sustained demand, the renewable energy products should be those that have the following attributes:

- ease to use,
- safe,
- brighter and cleaner,

- long product life,
- lower life cycle costs as compared to conventional sources such as paraffin cheap and fake products.



**Figure 4 Oleole Chief appreciating the Solar Lantern**

#### 4.5 Economic and Financial Viability of Energy Kiosks

The Economic and Financial Viability Assessment was done to assess whether the Solar Energy Kiosk and Minigrid business models could be commercially viable and sustainable ventures. The assessment incorporated results of the socio-economic study of the two areas and their potentials which involved assessing the willingness to pay for the solar products and services.

**Table 5** below shows the summary of planned services that the Solar Energy Kiosks will provide and related prices for each of the services. Prices were verified during the study by interviewing service providers in peri urban and township areas of Blantyre, Limbe and Machinjiri.

Item #	Service Description	Unit of Measurement	Per Unit Charge (MK)
1	Lantern charging	Each	500
2	Battery Charging	Each	200
3	Internet Service	Minute	20

4	Photocopying	Each	20
5	Printing	Each	100 black colour 300 colour printing
6	Printing & Typing	Each	200
7	Scanning	Each	200
8	Laminating	Each	350
9	TV Show	Each	20 movies 50 for Football
10	TNM Card	Each	350
	Airtel Card	Each	500
11	Phone Charging	Each	55
12	Phone Internet Setting	Each	500
13	Phone Application	Each	500
14	Computer Basic Lessons	Each /(per day)	350

**Table 5: Solar Service Charges**

## 4.5.1 Economic & Financial Viability of Nyamvuu Solar Kiosk

### 4.5.1.1 Assumptions for the financial model

The financial model for Nyamvuu Kiosk has been developed using the following assumptions:

- The current project beneficiaries will remain unconnected to the main power grid.
- There are 1150 households in Nyamvuu of which 300 will be the initial target beneficiaries of the project of the irrigation scheme
- There will be an annual increase of 20% in revenue.
- Exchange rate of MK717 per dollar will remain constant
- Lantern, battery, printing and phone charging will be the main revenue streams for the business.
- Five batteries will be charged per day at a price of MK200 (US\$0.2789) per battery.
- 50 lantern lamps will be charged per day at a price of MK500 (US\$0.6973)
- 50 pages will be printed per day at a cost of MK100 (US\$ 0.1394) per page
- There will be an annual increase in operating cost of 10%
- The Kiosk will operate as a social enterprise registered as a Limited Company by Guarantee hence not liable to remit corporate tax at 30% of profit after interest and depreciation to Malawi Revenue Authority
- The Kiosk will employ three full time staff
- The discount factor for computing the Net Present Value will be 24%. This represent the risk free rate or base lending rate of the Reserve Bank of Malawi
- The project will provide capital grant to Kiosk in form of assets worth US\$ 52, 207 which will be capitalized.
- Equipment will have a lifespan of 20 years whilst computers, furniture and building will have lifespans of 4, 10 and 50 years respectively.
- The above assumptions will remain applicable for twenty (20) years

### 4.5.1.2 Financial Statements

Using the above assumptions, a conservative approach was adopted in developing the financial model for the kiosk because of the poor economic status of the targeted project beneficiaries, lack of awareness about the solar products and lack of technical skills. The financial model comprise of the three main sets of financial statements namely:

- a) Statement of Comprehensive Income (formerly known as Profit and Loss Account)
- b) Statement of Financial Position (formerly known as Balance Sheet)

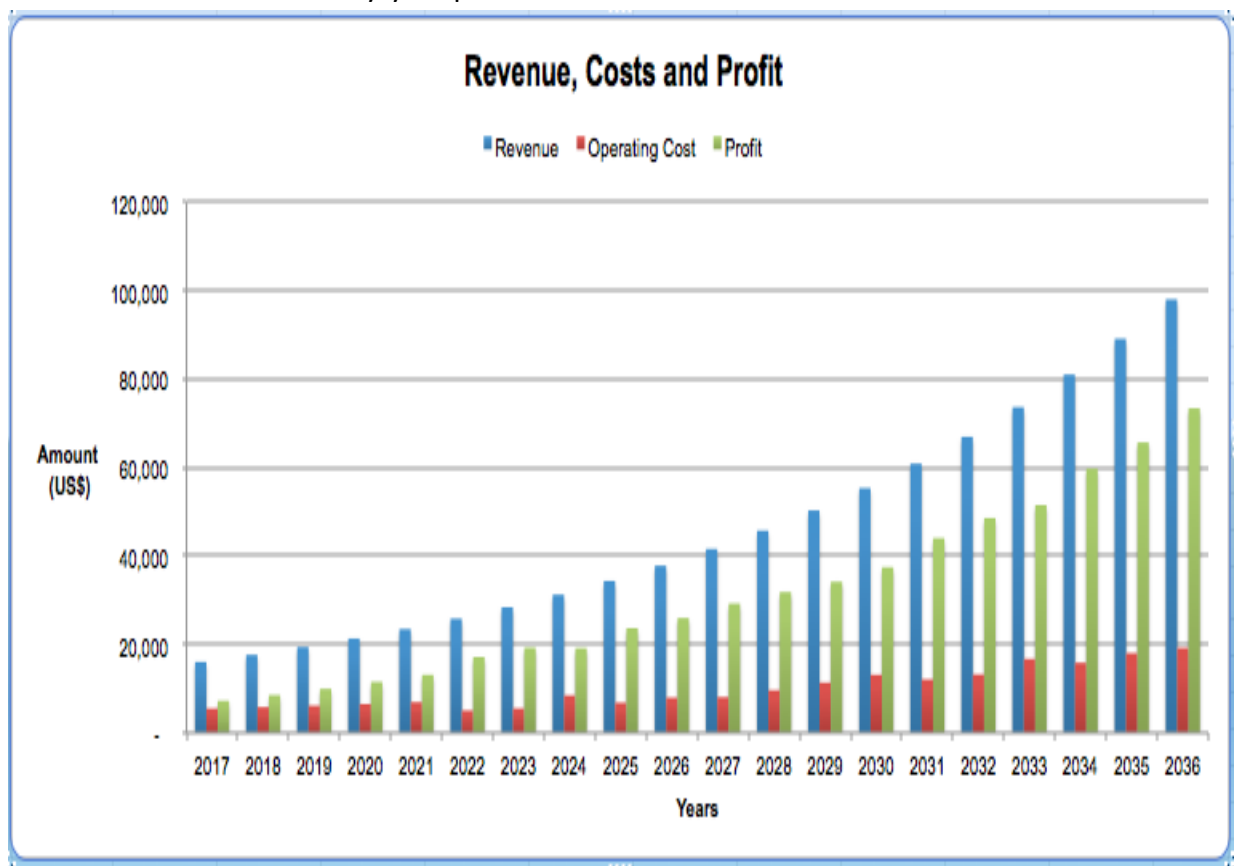
c) Statement of Cash Flows (formerly known as Cashflow Statement)

4.5.1.2.1 Statement of Comprehensive Income (Profit and Loss Account)

It is projected that as the per capita income of households increases, the demand for solar kiosk services will increase which will result into the increase in revenue and later alone profits. Sales are also expected to increase as the general public becomes aware of the benefits of using alternative clean energy sources and also as the number of start up businesses and agricultural productivity increases.

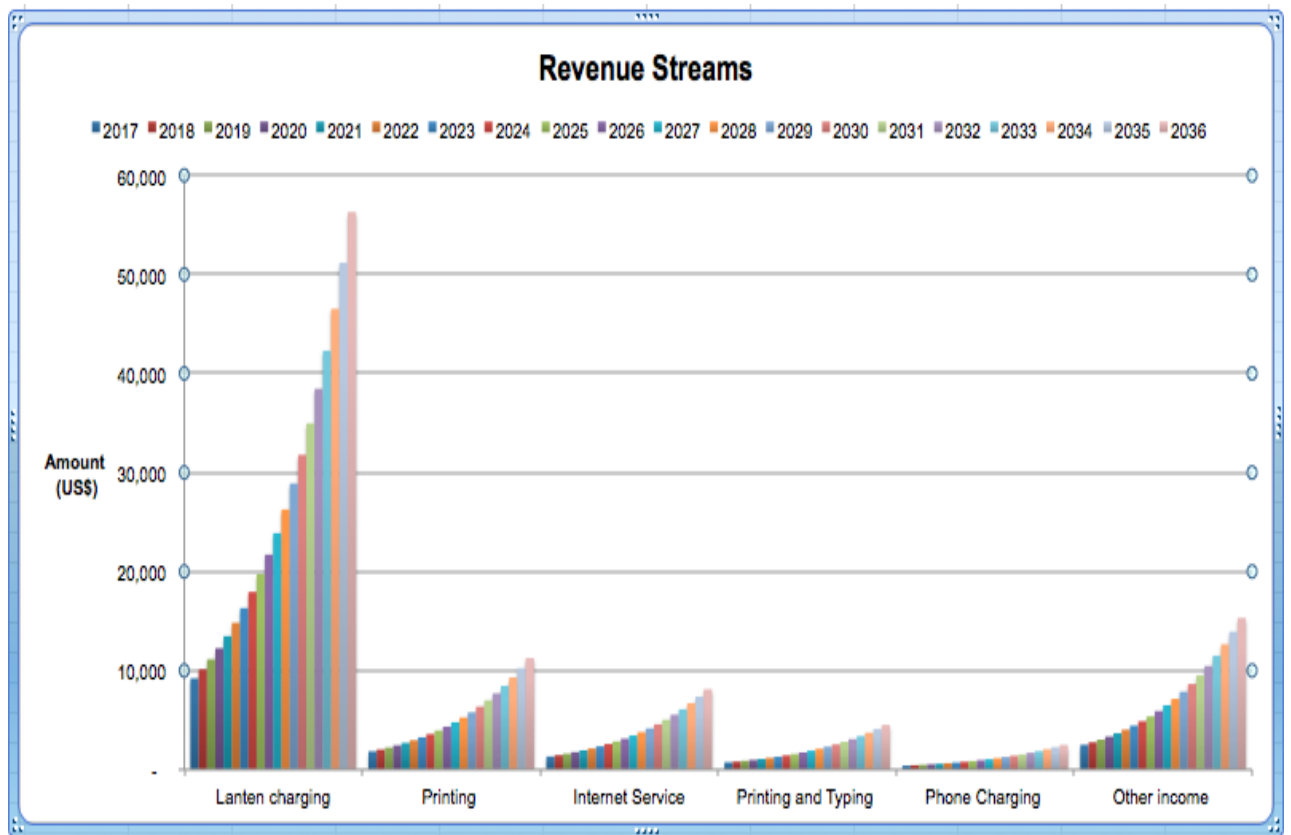
Sales for Nyamvuu Solar Energy Kiosk are envisaged to increase from US\$16,017 in 2017 to US\$97,957 in 2036 while profit will increase from US\$7,231 in 2017 to US\$73,345 in 2036. Refer to **Appendix 7.1.1** for the Statement of Comprehensive Income. It is envisaged that the establishment of a solar kiosk will spur the development of a number of small and medium enterprises in Nyamvuu. Operational costs are expected to remain relatively constant as the major costs for the Solar Kiosk relates to salaries, insurance and depreciation that are relatively fixed costs. Cost control strategies will be put in place to ensure that costs are minimised while maximising revenue.

**Figure 5** below shows the increase in revenue, operating costs and profit of the Solar kiosk within the first twenty-year period.



**Figure 5: Revenue Costs and Profit for Nyamvuu Kiosk**

As shown in **Figure 6** below, the main revenue streams will be lantern charging, printing and Internet service and phone charging. Lantern charging, typing and printing services have relatively higher charge rates compared to phone charging. Other income relate to revenue from sales of airtel and TNM phone cards, lamination, phone internet setting, battery charging, scanning and computer lesson whose demand are envisaged to be lower until a significant change in the social status of the population occurs.



**Figure 6: Different Revenue Streams for the Nyamvuu Solar Kiosk**

**4.5.1.2.2 Statement of Cash flows (Cash flow Statement)**

Nyamvuu is expected to receive a grant of US\$52,207, which will be used to procure assets and construct an office. Apart from the grant, the main source of cash for the business will be from trading. Since the Solar Kiosk business will be a newly established business, it is expected that it will not have easy access to a bank loan due to lack of good track record. The Kiosk however, could seize on the opportunity of working closely with the irrigation scheme to access bank loan as it is easy to access a loan when working in a group. The Solar Energy Kiosk will therefore rely on its internally generated income to finance its daily operations and save some to finance

future capital investments. As a start up, a significant portion of the profit realized within the first twenty years of operation will be retained to finance organic growth of the solar energy kiosk business.

Net cash flow for the Nyamvuu Solar Energy Kiosk is expected to increase from US\$10,530 in 2017 to US\$78,771 in 2036 while the accumulated cash flow will increase from US\$10,530 in 2018 to US\$679,630 in 2036.

Accumulative cash will increase as it is expected that only computers and furniture and fittings will be replaced using retained earnings and that all the surplus cash will be saved as reserves and reinvested back into the business. As a social enterprise, there will be no distribution of dividends. Refer to **Appendix 7.1.3** for Statement of Cash flows. The bar chart below shows the projected increase in net cash flow over the twenty-year period.

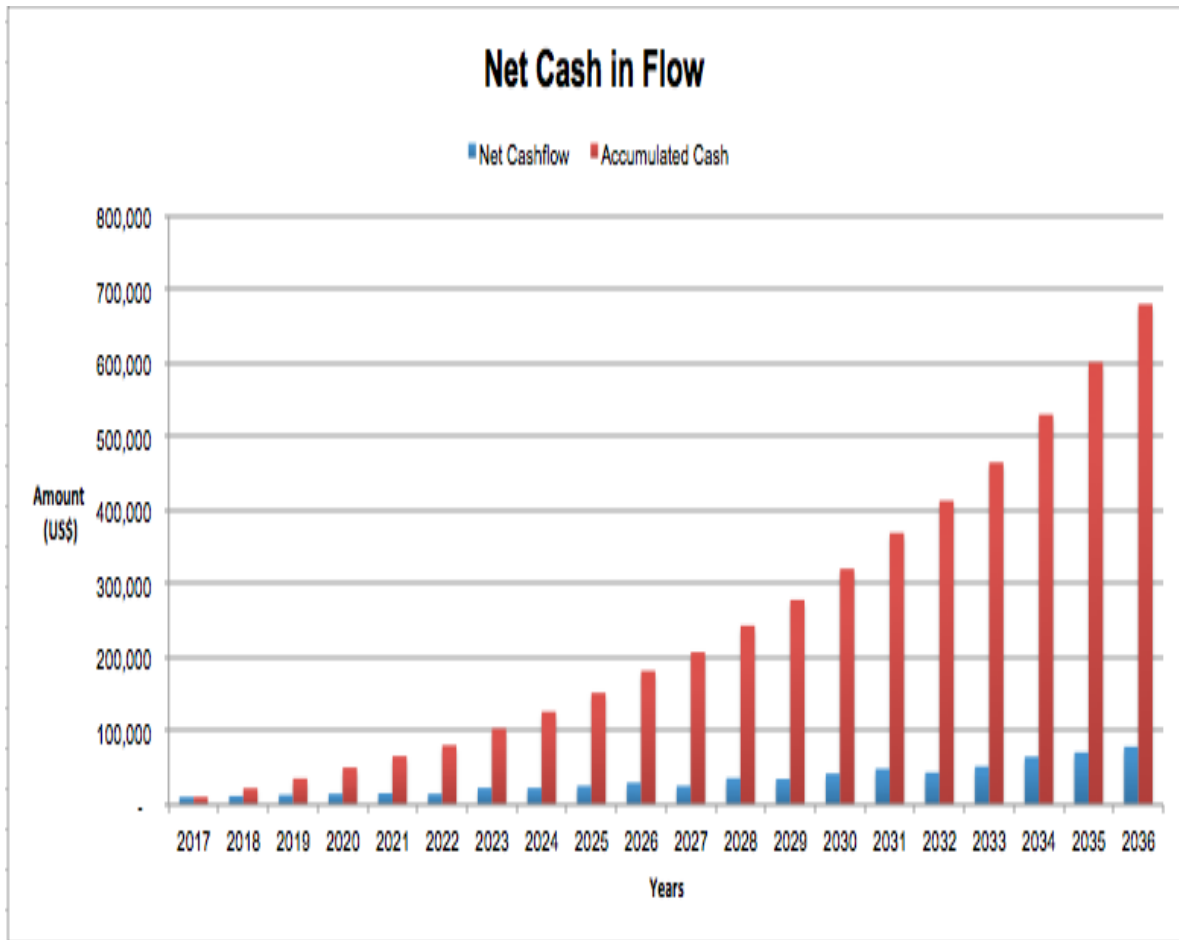


Figure 7: Net Cash flow for Nyamvuu Solar Kiosk

#### 4.5.1.2.3 Statement of Financial Position (Balance Sheet)

Nyamvuu Solar Energy Kiosk will depreciate its assets on a straight-line basis. Assets will be assessed at the end of each year to determine their remaining economic useful life according to IAS 16 and also for impairment losses as per IAS36. Assets will be repaired regularly in order to maintain their normal economic life. A fixed asset register will be maintained for all the assets to avoid pilferage. Assets will be depreciated as follows:

- a) Equipment at 5%
- b) Computer at 25%
- c) Furniture at 10%
- d) Building at 2%

The building will be depreciated annually at a rate of 2% for prudence sake as normally, buildings are expected to appreciate in value. The table below shows movement in net book value of the assets. Except for computers and batteries with a lifespan of 4 years and furniture and fitting with a lifespan of 10 years, the rest of the assets have a lifespan of 20 years and above as such, only computers, batteries and furniture and fitting are expected to be replaced during the 20-year period. Major capital investment is expected to occur in 2036 to replace or maintain the fully depreciated plant and equipment. Refer to **Appendix 7.1.2** for the Statement of Financial Position.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

Table 6 below shows the net book value of assets over the twenty year period.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-

Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

**Table 6: Net Book of Assets - Nyamvuu Solar Kiosk**

#### 4.5.1.2.4 Investment Appraisal

The commercial viability of Nyamvuu Solar Energy Kiosk has been analysed using the following tools:

- a) Financial Ratios
- b) Payback period
- c) Net Present Value
- d) Internal Rate of Return (IRR)

#### a) Financial Ratio Analysis

The Net Profit Margin for Nyamvuu Solar Energy Kiosk is expected to be 45% in 2017 and will increase to 75% by 2036. Net Profit Margins are expected to increase as overhead costs for the business are expected to be minimal. The high profit margin is indicative of the potential of the business to generate adequate profits and become sustainable. The business is expected to yield a return on capital employed of 12% in year one which is expected to decrease to 11% as cash reserves build up. The positive return on capital employed indicates that the investors into the business will be able to earn a profit and recoup their initial investment.

**Table 7** below shows financial ratio over the five-year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	45%	48%	51%	54%	56%	66%	68%	61%	69%	69%	70%	70%	68%	68%	72%	73%	70%	74%	74%	75%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%
<b>Return on Assets (ROA)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%

**Table 7: Financial Ratios Nyamvuu Solar Energy Kiosk**

**b) Net Present Value (NPV)**

A Positive Net Present Value of US\$20,449 was obtained after discounting the net cash inflows for twenty years at 24%. The Positive NPV indicates that Nyamvuu Solar Energy Kiosk would only be commercially viable in the first twenty years of operations based on the assumptions used. Negative NPV was obtained when net cash flows were discounted for 10 years. A discount factor of 24% is based on the Reserve Bank of Malawi's base lending rate. Discount factor was computed using a formula,  $1/(1+R)^n$  where "r" is base lending rate and "n" is the number of years. Table 8 Below shows NPV computation.

NET PRESENT VALUE (NPV)																					
Years	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(52,207)																				
Net Cash Inflow		10,530	11,822	13,243	14,806	15,526	14,759	22,865	22,762	25,530	29,824	25,433	36,080	34,918	42,189	48,766	43,722	51,903	65,130	71,053	78,771
Discount Factor (24%)	1.0000	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397	0.0320	0.0258	0.0208	0.0168	0.0135
<b>Net Present Value</b>	<b>(52,207)</b>	<b>8,492</b>	<b>7,688</b>	<b>6,946</b>	<b>6,263</b>	<b>5,296</b>	<b>4,060</b>	<b>5,072</b>	<b>4,072</b>	<b>3,683</b>	<b>3,470</b>	<b>2,386</b>	<b>2,730</b>	<b>2,131</b>	<b>2,076</b>	<b>1,935</b>	<b>1,399</b>	<b>1,340</b>	<b>1,356</b>	<b>1,193</b>	<b>1,066</b>
<b>Total NPV</b>	<b>20,449</b>																				

**Table 8. Net Present Value Table Nyamvuu Solar Energy Kiosk**

**c) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 25.9%<sup>1</sup>, which is greater than the base bank-lending rate of 24% for the Reserve Bank of Malawi. This further supports the assertion that the investment in Nyamvuu Solar Energy Kiosk could become commercially viable within twenty 20 years.

**d) Payback period**

The initial investment in Nyamvuu Solar Energy Kiosk is expected to have a pay back period of 5.89 years. Refer to **Appendix 7.1.4** for detailed information about the pay back period.

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<sup>1</sup>  $IRR = L + \{(NPV_1 / (NPV_1 - NPV_2)) \times (H - L)\}$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

## 4.5.2 Economic and Financial Viability of Oleole Solar Kiosk

As revealed by the study, the economic status of Oleole is better than Nyamvuu. The study revealed that the average household income for Oleole was MK77,373 (US\$107.91) per year while that of Nyamvuu was MK66,052 (US\$92.12) per year. The willingness to pay for Oleole was MK8,928 ( US\$12.45) per month while Nyamvuu is MK5000 (US\$6.97) per month. Oleole is located closer to Chikwawa District and to the main grid line compared to Nyamvuu. Furthermore, the target number of beneficiaries for Oleole is 800 while for Nyamvuu is 300.

The above differences have been considered in coming up with the assumptions below for the financial model.

### 4.5.2.1 Assumptions

Except for the assumptions summarised below, the rest of the assumptions that were used on developing the financial model for Nyamvuu Solar Energy Kiosk are also applicable to Oleole Solar Energy Kiosk:

Below are exceptional assumptions for Oleole Solar Energy Kiosk

- There are 3,700 households in Oleole of which 800 are the initial target beneficiaries of the project.
- The project will provide capital grant to Kiosk in form of assets worth US\$ 52, 207, which will be capitalized.

### 4.5.2.2 Financial Statements

#### 4.5.2.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales will increase from US\$19,699 in 2017 to US\$120,476 in 2036 while profit will increase from US\$7,315 in 2017 to US\$73,857 in 2036. Refer to **Appendix 7.2.1** for the Statement of Comprehensive Income.

As is the case with Nyamvuu, it is envisaged that the establishment of a solar energy kiosk will spur the development of a number of small and medium enterprises in Oleole. Operational costs are expected to remain relatively constant as the major costs for the Solar Kiosk relates to salaries, insurance and depreciation that are relatively fixed costs. The Solar Kiosk will put in place strategies to ensure that costs incurred are within the budget or income generation capacity of the business hence sustainable. **Figure 8** below shows the increase in revenue, operating costs and profit of the Solar Kiosk within a twenty-year period.

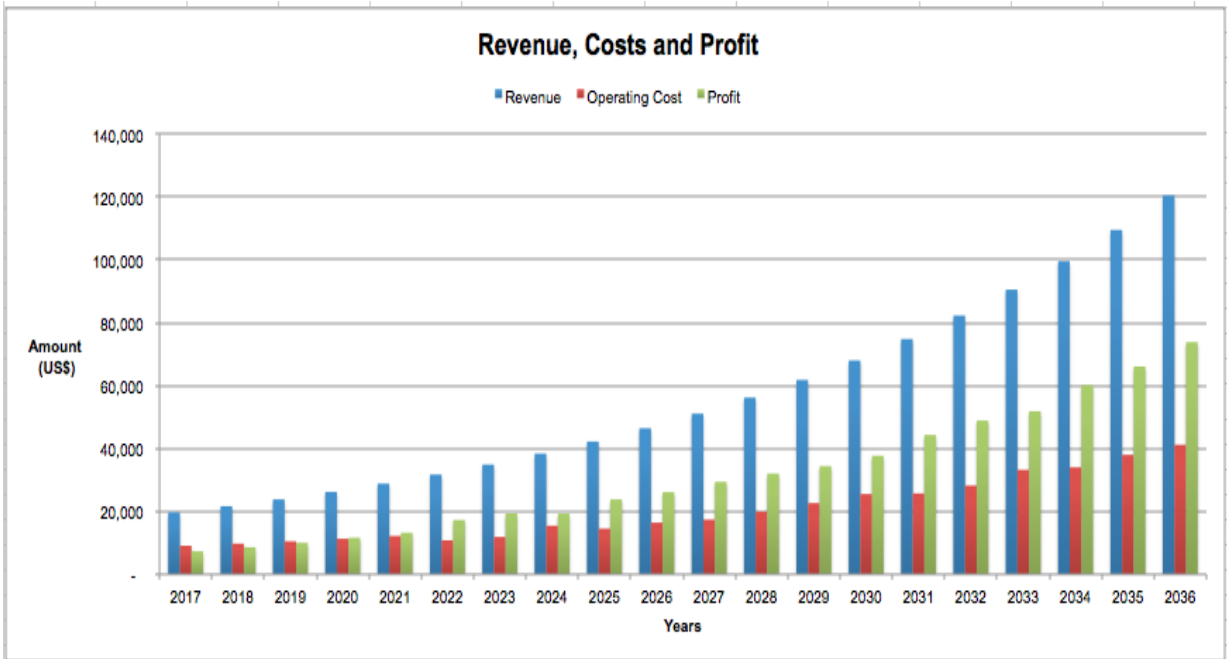


Figure 8: Revenue Cost and Profit Oleole Solar Kiosk

As shown in Figure 9 below, the main revenue streams will be lantern charging, printing and Internet service and phone charging. Lantern charging, typing and printing services have relatively higher charge rates compared to phone charging. Other income relate to revenue from sales of airtel and TNM phone cards, lamination, phone internet setting, battery charging, scanning and computer lesson whose demand are envisaged to be comparatively lower.

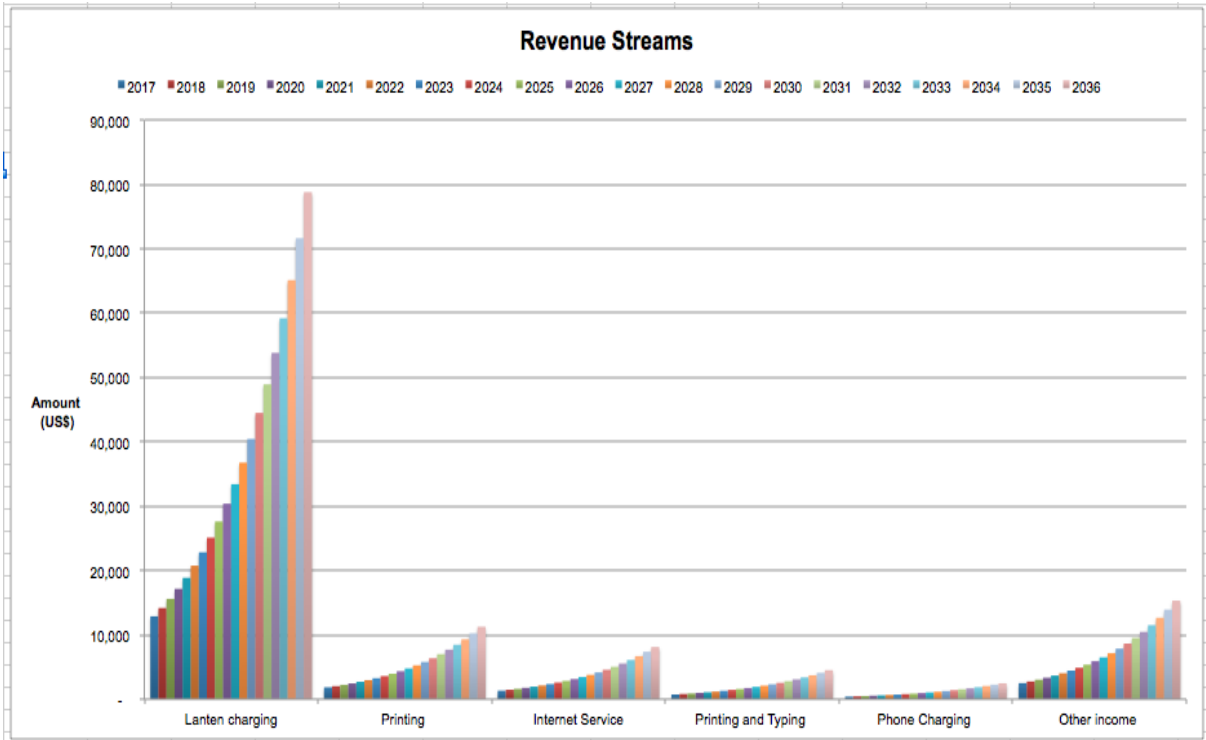


Figure 9: Revenue Streams for Oleole Solar Energy Kiosk

4.5.2.2.2 Statement of Cash flows (Cash flow Statement)

Oleole is expected to receive a grant of US\$52,207, which will be used to procure assets and construct an office. Apart from the grant, the main source of cash for the business will be trading. Since the Solar Energy Kiosk business will be a newly established business, it is expected that it will not have easy access to bank loan due to lack of good business track record. The Kiosk however, could seize on the opportunity of working closely with the irrigation scheme to access bank loan as it is easy to access a finance in a group. The Solar Energy Kiosk will therefore rely on its internally generated income to finance its daily operations and save some to finance future capital investments. As an early start up, any profit realized within the first twenty years of the business will be retained to finance organic growth of the Solar Energy Kiosk.

Net cash flow for Oleole Solar Energy Kiosk is expected to increase from US\$10,613 in 2017 to US\$79,282 in 2036 while the accumulated cash flow will increase from US\$10,613 in 2017 to US\$605,140 in 2036. Accumulative cash will increase as it is expected that only the fully depreciated computers and furniture and fittings during the twenty year period will be replaced using retained earnings. Refer to **Appendix 7.2.3** for Statement of Cash flows.

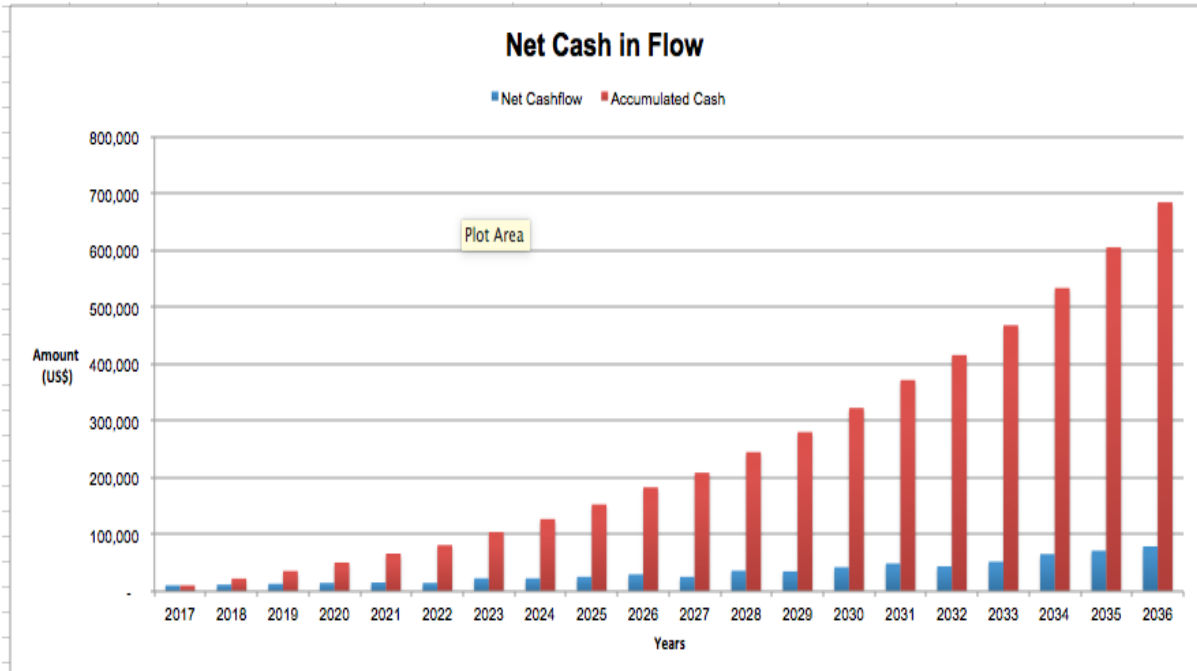


Figure 10 below shows the projected increase in net cash flow over the twenty-year period.

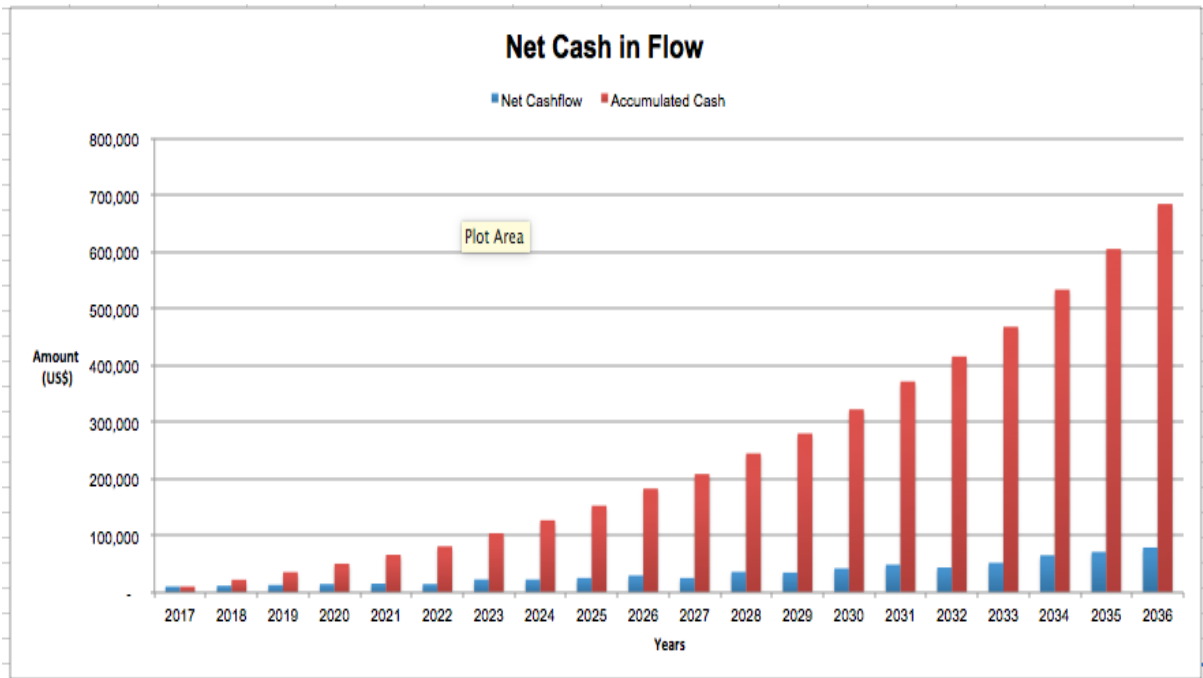


Figure 10: Net Cash Flow for Oleole Solar Kiosk

#### 4.5.2.2.3 Statement of Financial Position (Balance Sheet)

The same aforementioned depreciation policy for Nyamvuu Solar Energy Kiosk applies to Oleole assets.

. Refer to **Appendix 7.2.2** for the Statement of Financial Position.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

Table 9 below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

**Table 9: Net Book Value of Assets for Oleole Solar Kiosk**

#### 4.5.2.2.4 Investment Appraisal

The commercial viability of Oleole Solar Energy Kiosk has been analysed using the following tools:

- a) Financial Ratios
- b) Payback period
- c) Net Present Value
- d) Internal Rate of Return (IRR)

#### a) Financial Ratio Analysis

The Net Profit Margin for Oleole Solar Energy Kiosk is expected to increase from 37% to 61% for the same reasons as that of Nyamvuu Solar Energy Kiosk. The return on capital employed is also expected to decrease from 12% in 2017 to 11% 2036. The cash reserve is expected to decrease in 2036 /2037 as the fully depreciated equipment and plant will need to be overhauled or replaced. **Table 10** below shows the financial ratios for the twenty year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	37%	40%	42%	44%	46%	54%	56%	50%	56%	56%	58%	57%	56%	55%	59%	59%	57%	60%	60%	61%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	13%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%
<b>Return on Assets (ROA)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	13%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%

**Table 10: Financial Ratio Oleole Solar Kiosk**

**b) Net Present Value (NPV)**

A discount factor of 24% was used to calculate the Net Present Value of future cash inflows into the business. The discount factor is based on the Reserve Bank of Malawi’s base lending rate. A Positive Net Present Value of US\$20,992 was obtained after discounting the net cash inflows for twenty years. This implied that the investment in Oleole Solar Energy Kiosk would be a viable venture within twenty years of operations. Discount factor was computed using a formula,  $1/(1+R)^n$  where r is base lending rate and n represent the number of years.

NET PRESENT VALUE																					
Years	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(52,207)																				
Net Cash Inflow		10,613	11,914	13,344	14,918	15,649	14,893	23,013	22,925	25,709	30,022	25,650	36,319	35,180	42,478	49,083	44,072	52,288	65,553	71,519	79,282
Discount Factor (24%)	1.0000	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397	0.0320	0.0258	0.0208	0.0168	0.0135
Net Present Value	(52,207)	8,559	7,748	6,999	6,310	5,338	4,097	5,105	4,102	3,709	3,493	2,407	2,748	2,147	2,091	1,948	1,411	1,350	1,365	1,201	1,073
<b>Total NPV</b>	<b>20,992</b>																				

**Table 11: Net Present Value Table Oleole**

**c) Payback period**

The initial investment in Oleole Solar Energy Kiosk is expected to have a pay back period of more than 5.92 years. Refer **Appendix 7.2.4**

**d) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 25.95%<sup>2</sup>, which is greater than the base bank-lending rate of 24% for the Reserve Bank of Malawi and base-lending rate of commercial bank of 32%<sup>3</sup>. The result is indicative that the investors will be able to recoup their investment in the business within 20 years.

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<sup>2</sup>  $IRR = L + \{(NPV_1 / (NPV_1 - NPV_2)) \times (H - L)$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

<sup>3</sup> 32% is the National Bank of Malawi base lending rate effective 1<sup>st</sup> December 2016

### 4.5.3 Economic and Financial Viability of Mwalija Solar Kiosk

#### 4.5.3.1 Assumptions

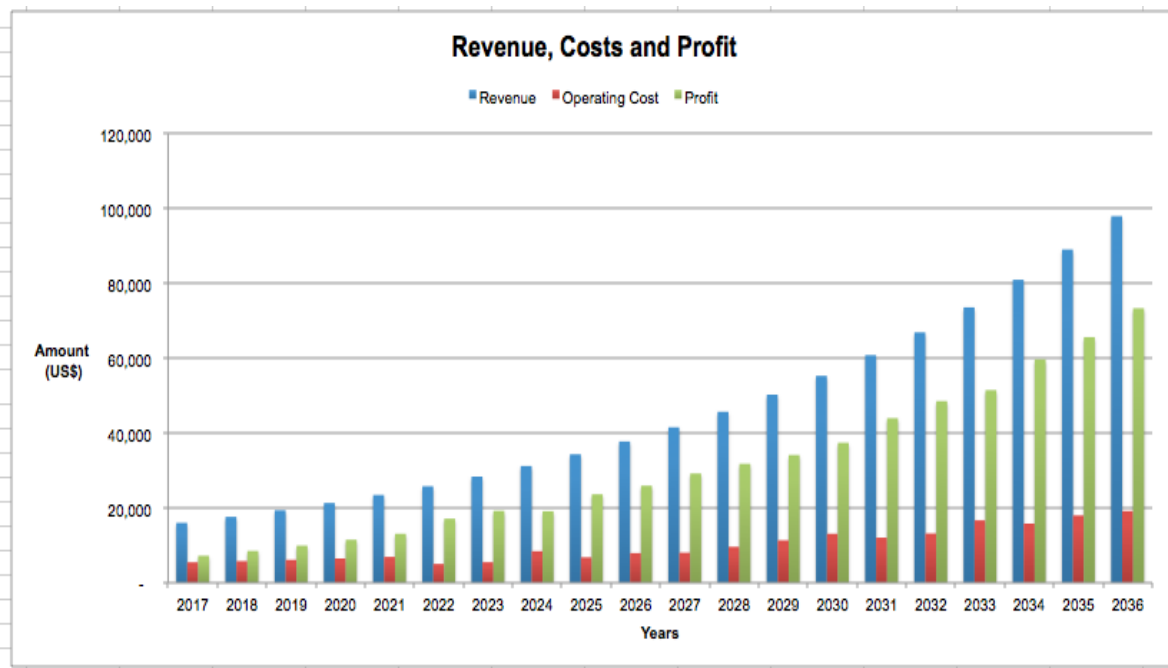
The same assumptions that applied to the other Solar Energy Kiosks are applicable to Mwalija Solar Energy Kiosk.

#### 4.5.3.2 Financial Statements

##### 4.5.3.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales will increase from US\$16,017 in 2017 to US\$97,957 in 2036 while profit will increase from US\$7,231 in 2017 to US\$73,857 in 2036. Refer to **Appendix 7.3.1** for the Statement of Comprehensive Income.

**Figure 11** below shows the increase in revenue, operating costs and profit of the Solar Kiosk within a twenty-year period.



**Figure 11: Revenue Cost and Profit Mwalija Solar Kiosk**

The same revenue streams for Nyamvuu and Oleole apply to Mwalija Solar Energy Kiosk as shown in **Figure 12** below.

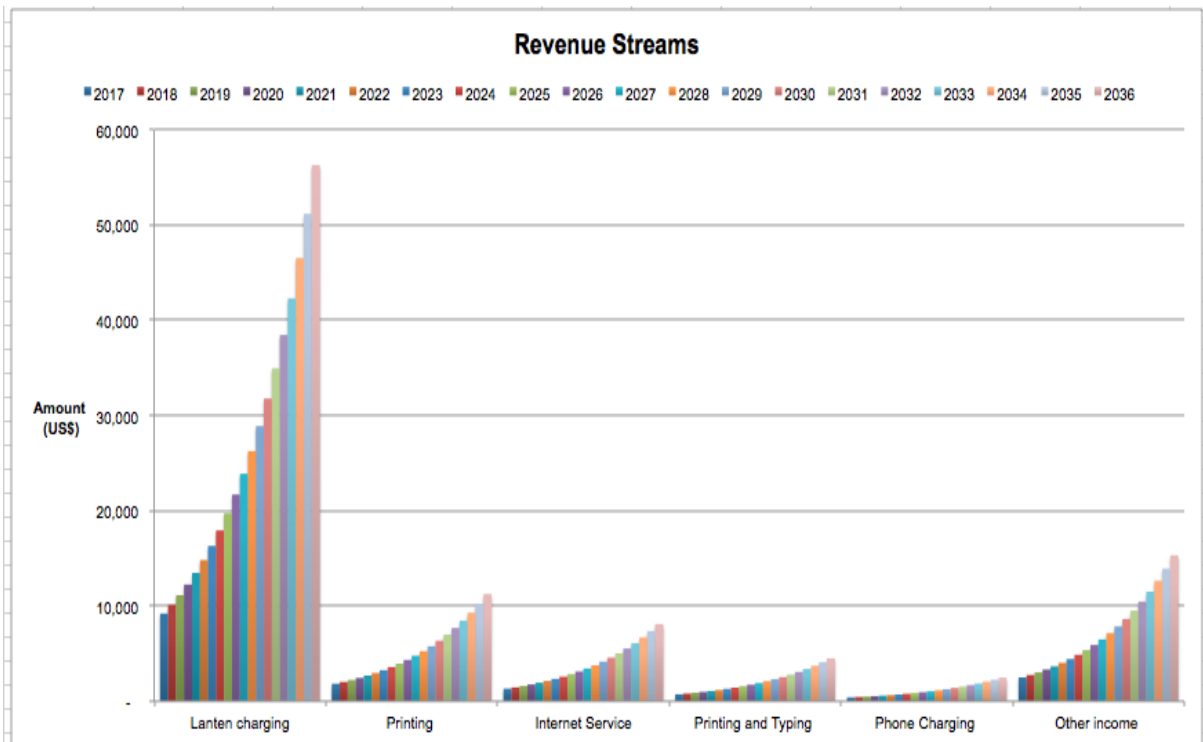


Figure 12: Revenue Streams for Mwalija Solar Energy Kiosk

#### 4.5.3.2.2 Statement of Cash flows (Cash flow Statement) Mwalija

Mwalija is expected to receive a grant of US\$52.207, which will be used to procure assets and construct an office. The Net cash flow for the Mwalija Solar Energy Kiosk is expected to increase from US\$10,530 in 2017 to US\$78,771 in 2036 while the accumulated cash flow will increase from US\$10,613 in 2017 to US\$600,859 in 2036. Accumulative cash will increase as it is expected that only computers and furniture and fitting will be replaced using retained earnings while the rest of the net profit will be maintained as reserves. Refer to **Appendix 7.3.3** for Statement of Cash flows. **Figure 13** below shows the projected increase in net cash flow over the twenty-year period.

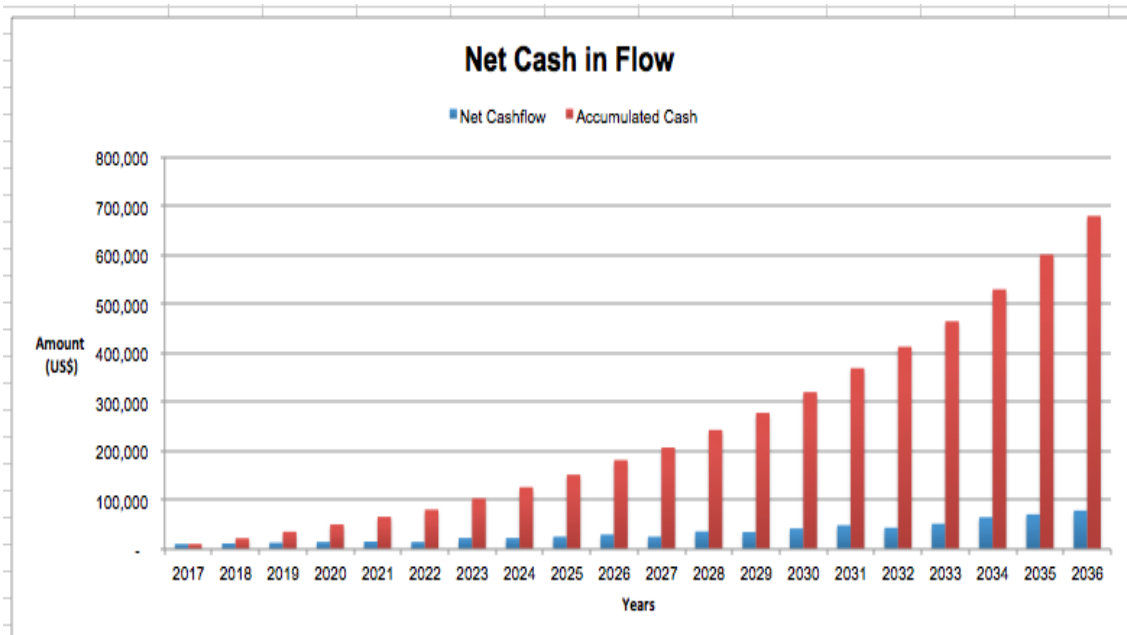


Figure 13: Net Cash Flow for Mwalija Solar Kiosk



#### 4.5.3.2.3 Statement of Financial Position (Balance Sheet)

The same information on depreciation and fixed asset replacement for the other solar energy kiosks apply to Mwalija. Refer to **Appendix 7.3.2** for the Statement of Financial Position. **Table 12** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

**Table 12: Net Book Value of Assets for Mwalija Solar Kiosk**

#### 4.5.3.2.4 Investment Appraisal

##### a) Financial Ratio Analysis

The Net Profit Margin for Mwalija Solar Energy Kiosk is expected to increase from 37% to 61%, which is indicative of the potential viability of the business. The business return on capital employed is expected to decrease from 12% from 2017 to 11% 2036 not necessarily because of poor performance but rather because of the increase in asset base as a result of accumulation of cash as there will be no dividend pay-outs. The cash reserve is expected to decrease in 2036 /2037 as the fully depreciated equipment and plant will need to be overhauled or replaced. **Table 13** below shows the financial ratios for the twenty-year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	45%	48%	51%	54%	56%	66%	68%	61%	69%	69%	70%	70%	68%	68%	72%	73%	70%	74%	74%	75%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%
<b>Return on Assets (ROA)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%

**Table 13: Financial Ratio Mwalija Solar Kiosk**

**b) Net Present Value (NPV)**

A discount factor of 24% was used to calculate the present value of future cash inflows into the business. The discount factor is based on the Reserve Bank of Malawi's base lending rate. A Positive Net Present Value of US\$20,449 was obtained after discounting the net cash inflows for twenty years. This implied that Mwalija Solar Energy Kiosk would be viable business venture within twenty years of operations.

Discount factor was computed using a formula,  $1/(1+R)^n$  where r is base lending rate and n represent the number of years.

Net Present Value																					
Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(52,207)																				
Net Cash Inflow		10,530	11,822	13,243	14,806	15,526	14,759	22,865	22,762	25,530	29,824	25,433	36,080	34,918	42,189	48,766	43,722	51,903	65,130	71,053	78,771
Discount Factor ( 24%)	1.0000	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397	0.0320	0.0258	0.0208	0.0168	0.0135
<b>Net Present Value</b>	<b>(52,207)</b>	<b>8,492</b>	<b>7,688</b>	<b>6,946</b>	<b>6,263</b>	<b>5,296</b>	<b>4,060</b>	<b>5,072</b>	<b>4,072</b>	<b>3,683</b>	<b>3,470</b>	<b>2,386</b>	<b>2,730</b>	<b>2,131</b>	<b>2,076</b>	<b>1,935</b>	<b>1,399</b>	<b>1,340</b>	<b>1,356</b>	<b>1,193</b>	<b>1,066</b>
<b>Total NPV</b>	<b>20,449</b>																				

**Table 14: Net Present Value Table Mwalija**

**c) Payback period**

The initial investment in Mwalija Solar Energy Kiosk is expected to have a pay back period of more than 5.89 years. Refer to **Appendix 7.3.4** for payback period computation for Mwalija

**d) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 25.90%<sup>4</sup>, which is greater than the base bank-lending rate of 24% for the Reserve Bank of Malawi and base-lending rate of commercial bank of 32%<sup>5</sup>. The result is indicative that the investors will be able to recoup their investment in the business within 20 years.

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<sup>4</sup>  $IRR = L + \{(NPV_1 / (NPV_1 - NPV_2)) \times (H - L)$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

<sup>5</sup> 32% is the National Bank of Malawi base lending rate effective 1<sup>st</sup> December 2016

#### 4.5.4 Economic and Financial Viability of Mmelo Solar Kiosk

##### 4.5.4.1 Assumptions

The same assumptions that applied to the other Solar Energy Kiosks are applicable to Mmelo Solar Energy Kiosk.

##### 4.5.4.2 Financial Statements

###### 4.5.4.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales will increase from US\$16,017 in 2017 to US\$97,957 in 2036 while profit will increase from US\$7,231 in 2017 to US\$73,345 in 2036. Refer to **Appendix 7.4.1** for the Statement of Comprehensive Income. Figure 14 below shows the increase in revenue, operating costs and profit of the Solar Kiosk within a twenty-year period.

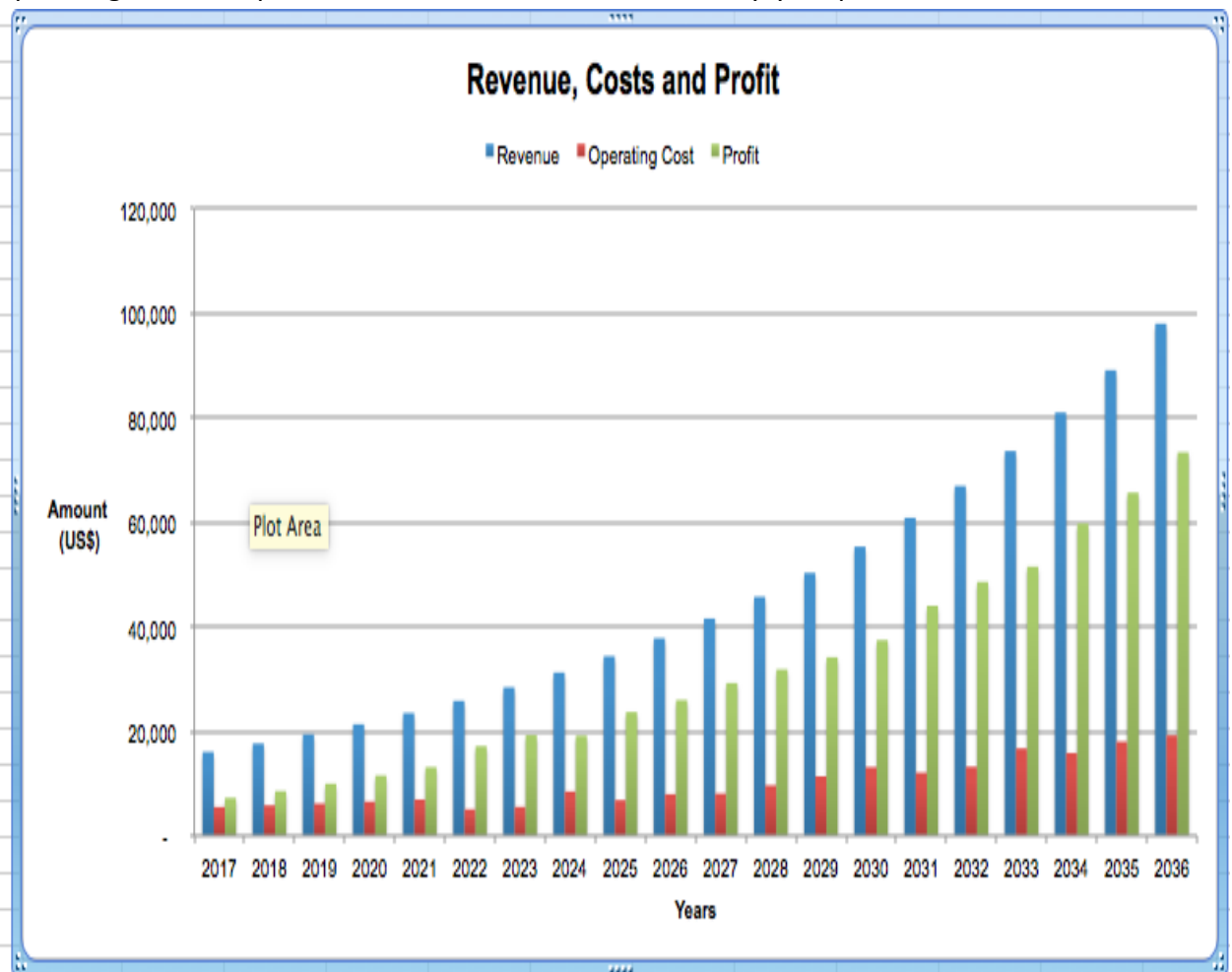


Figure 14: Revenue Cost and Profit Mmelo Solar Kiosk

Figure 14 below shows the different revenue streams for Mmelo Solar Energy Kiosk.

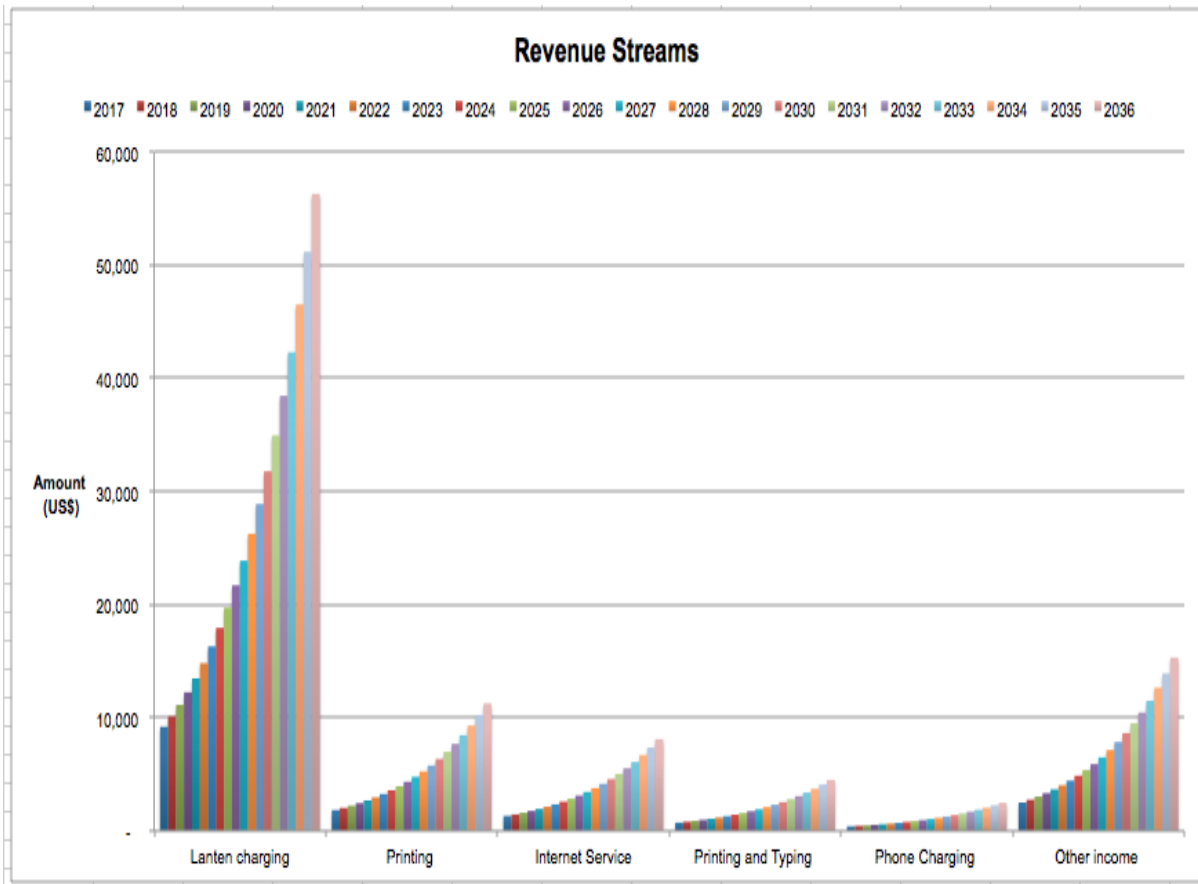


Figure 15: Revenue Streams for Mwalija Solar Energy Kiosk

#### 4.5.4.2.2 Statement of Cash flows (Cash flow Statement)

Mmelo Solar Energy Kiosk is expected to receive a grant of US\$52.207, which will be used to procure assets and construct an office. The Net cash flow for the Mmelo Solar Energy Kiosk is expected to increase from US\$10,530 in 2017 to US\$78,771 in 2036 while the accumulated cash flow will increase from US\$10,613 in 2017 to US\$600,859 in 2036. Accumulative cash will increase as it is expected that only computers and furniture and fitting will be replaced using retained earnings while the rest of the net profit will be maintained as reserves. Refer to **Appendix 7.4.3** for Statement of Cash flows.

Figure 16 below shows the projected increase in net cash flow over the twenty-year period.

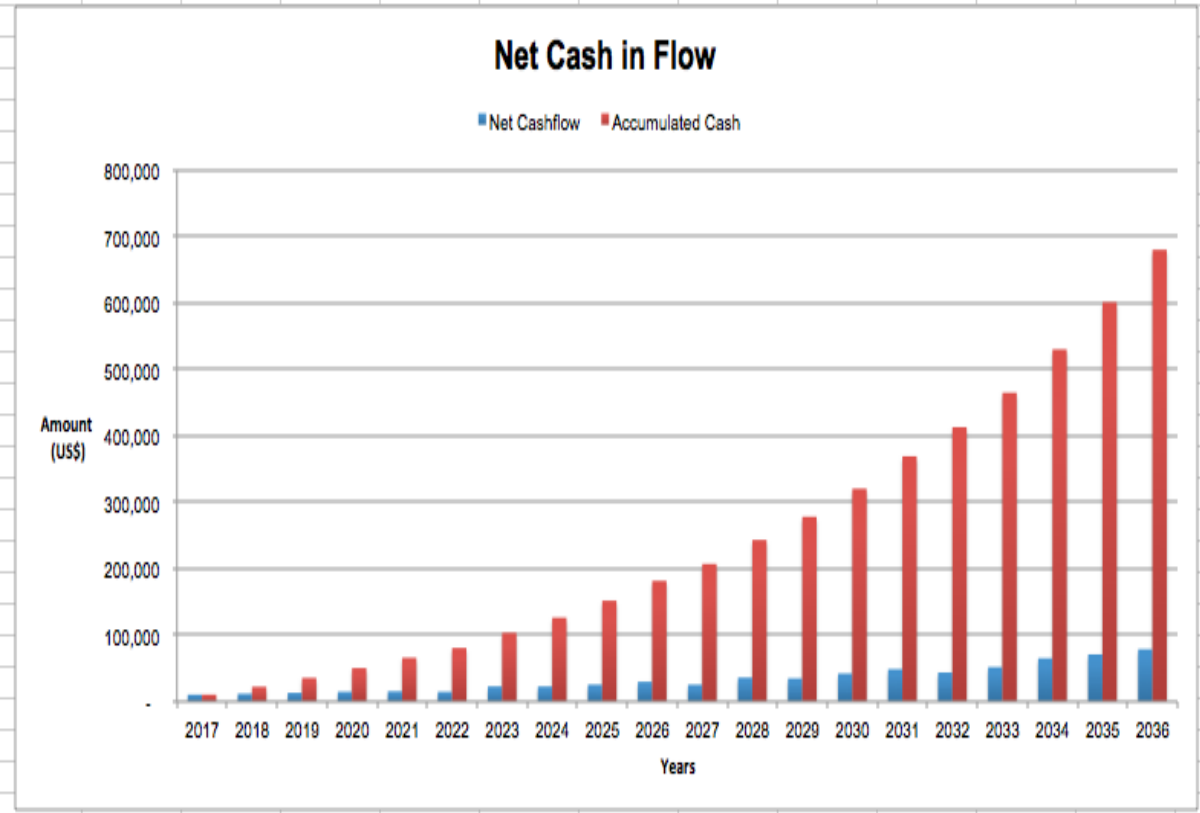


Figure 16: Net Cash Flow for Mmelo Solar Energy Kiosk

#### 4.5.4.2.3 Statement of Financial Position (Balance Sheet)

The same depreciation policy for the other Solar Energy Kiosks applies to Mwalija Solar Energy Kiosk. A huge capital outlay is expected after 2036 as equipment and plant, which forms a significant component of the total asset value, will be fully depreciated by 2036 and will need to be either replaced or overhauled. Refer to **Appendix 7.4.2** for the Statement of Financial Position. **Table 15** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

**Table 15: Net Book Value of Assets for Mmelo Solar Kiosk**

4.5.4.2.4 Investment Appraisal

**a) Financial Ratio Analysis**

The Net Profit Margin for Mmelo Solar Energy Kiosk is expected to increase from 45% to 75%, which is indicative of the potential viability of the business. The business return on capital employed is expected to decrease from 12% from 2017 to 11% 2036 not necessarily because of poor performance but rather because of the increase in asset base as a result of accumulation of cash as there will be no dividend pay-outs. The cash reserve is expected to decrease in 2036 /2037 as the fully depreciated equipment and plant will need to be overhauled or replaced. Table 13 below shows the financial ratios for the twenty-year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	45%	48%	51%	54%	56%	66%	68%	61%	69%	69%	70%	70%	68%	68%	72%	73%	70%	74%	74%	75%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%
<b>Return on Assets (ROA)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%

**Table 16: Financial Ratio Mmelo Solar Kiosk**

**b) Net Present Value (NPV)**

A discount factor of 24% was used to calculate the present value of future cash inflows into the business. The discount factor is based on the Reserve Bank of Malawi’s base lending rate. A Positive Net Present Value of US\$20,449 was obtained after discounting the net cash inflows for twenty years. This implied that Mmelo Solar Energy Kiosk would be viable business venture within twenty years of operations.

Discount factor was computed using a formula,  $1/(1+R)^n$  where r is base lending rate and n represent the number of years.

Net Present Value																					
Years	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(52,207)																				
Net Cash Inflow		10,530	11,822	13,243	14,806	15,526	14,759	22,865	22,762	25,530	29,824	25,433	36,080	34,918	42,189	48,766	43,722	51,903	65,130	71,053	78,771
Discount Factor (24%)	1.0000	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397	0.0320	0.0258	0.0208	0.0168	0.0135
<b>Net Present Value</b>	<b>(52,207)</b>	<b>8,492</b>	<b>7,688</b>	<b>6,946</b>	<b>6,263</b>	<b>5,296</b>	<b>4,060</b>	<b>5,072</b>	<b>4,072</b>	<b>3,683</b>	<b>3,470</b>	<b>2,386</b>	<b>2,730</b>	<b>2,131</b>	<b>2,076</b>	<b>1,935</b>	<b>1,399</b>	<b>1,340</b>	<b>1,356</b>	<b>1,193</b>	<b>1,066</b>
<b>Total NPV</b>	<b>20,449</b>																				

**Table 17: Net Present Value Table Mmelo**

**c) Payback period**

The initial investment in Mmelo Solar Energy Kiosk is expected to have a pay back period of more than 5.89 years. Refer **Appendix 7.4.4**

**d) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 25.90%<sup>6</sup>, which is greater than the base bank-lending rate of 24% for the Reserve Bank of Malawi and base-lending rate of commercial bank of 32%<sup>7</sup>. The result is indicative that the investors will be able to recoup their investment in the business within 20 years.

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<sup>6</sup>  $IRR = L + \{(NPV_1 / (NPV_1 - NPV_2)) \times (H - L)\}$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

<sup>7</sup> 32% is the National Bank of Malawi base lending rate effective 1<sup>st</sup> December 2016

## 4.5.5 Economic and Financial Viability of Nguluwe Solar Kiosk

### 4.5.5.1 Assumptions

The same assumptions that applied to the other Solar Energy Kiosks are applicable to Nguluwe Solar Energy Kiosk.

### 4.5.5.2 Financial Statements

#### 4.5.5.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales will increase from US\$16,017 in 2017 to US\$97,957 in 2036 while profit will increase from US\$7,231 in 2017 to US\$73,345 in 2036. Refer to **Appendix 7.4.1** for the Statement of Comprehensive Income. Figure 14 below shows the increase in revenue, operating costs and profit of the Solar Kiosk within a twenty-year period.

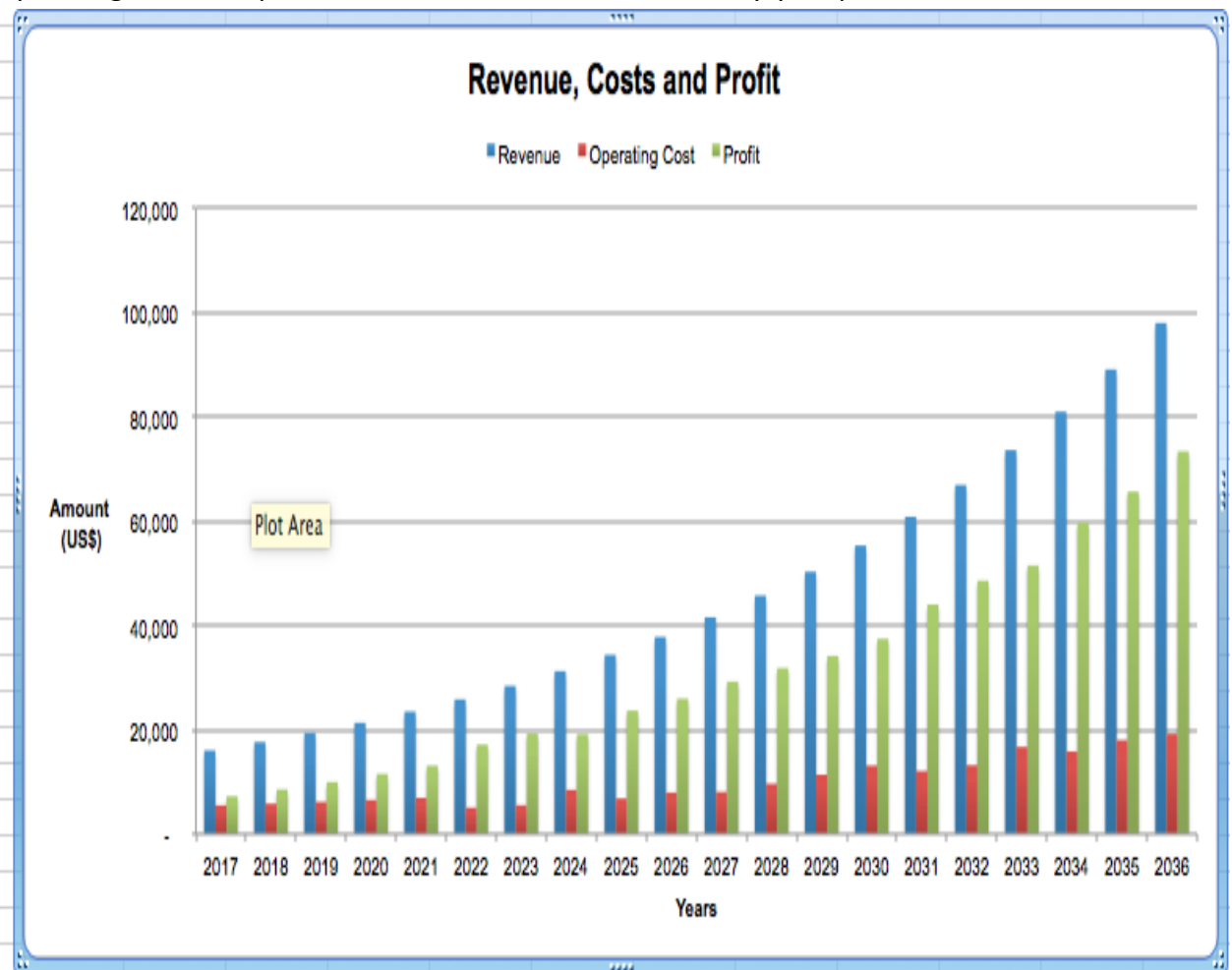


Figure 17: Revenue Cost and Profit Nguluwe Solar Kiosk

Figure 14 below shows the different revenue streams for Nguluwe Solar Energy Kiosk.

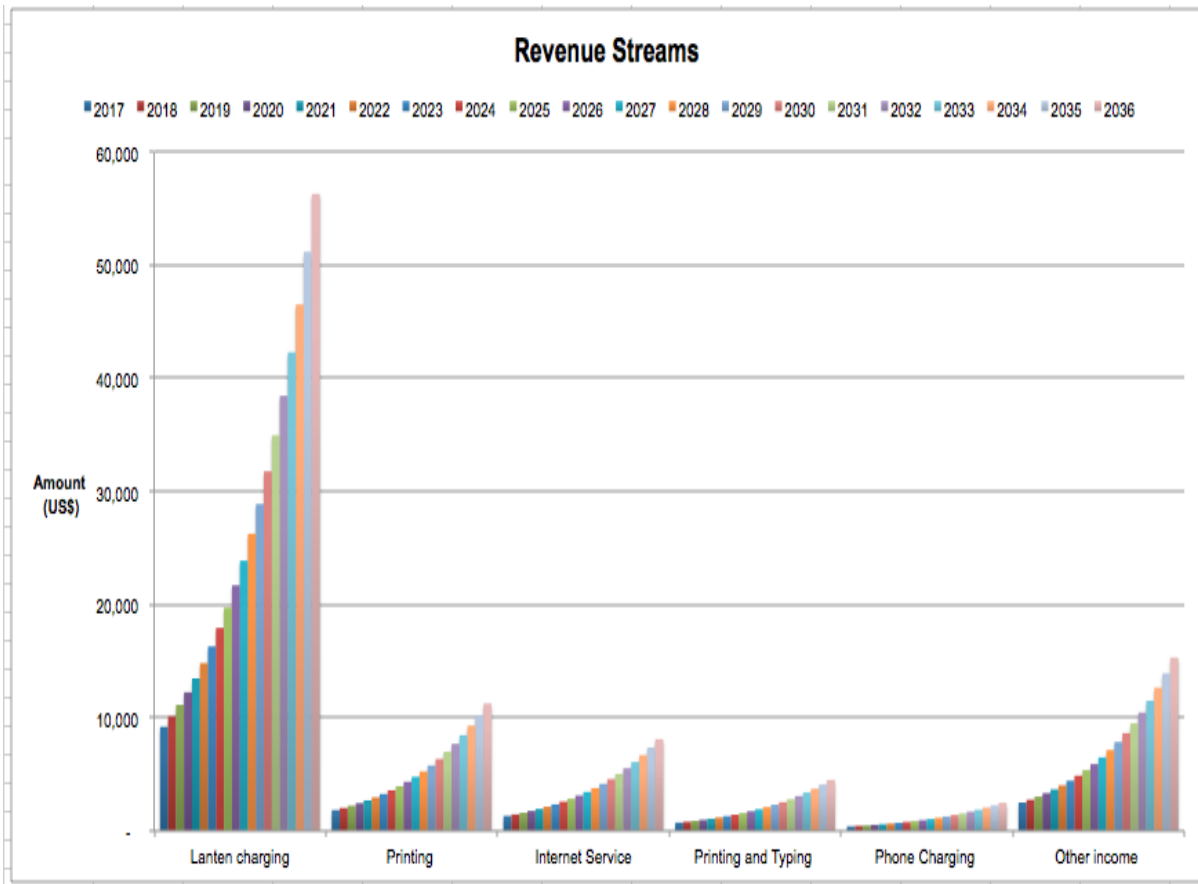


Figure 18: Revenue Streams for Mwalija Solar Energy Kiosk

#### 4.5.5.2.2 Statement of Cash flows (Cash flow Statement)

Nguluwe Solar Energy Kiosk is expected to receive a grant of US\$52,207, which will be used to procure assets and construct an office. The Net cash flow for the Nguluwe Solar Energy Kiosk is expected to increase from US\$10,530 in 2017 to US\$78,771 in 2036 while the accumulated cash flow will increase from US\$10,613 in 2017 to US\$600,859 in 2036. Accumulative cash will increase as it is expected that only computers and furniture and fitting will be replaced using retained earnings while the rest of the net profit will be maintained as reserves. Refer to **Appendix 7.4.3** for Statement of Cash flows.

Figure 16 below shows the projected increase in net cash flow over the twenty-year period.

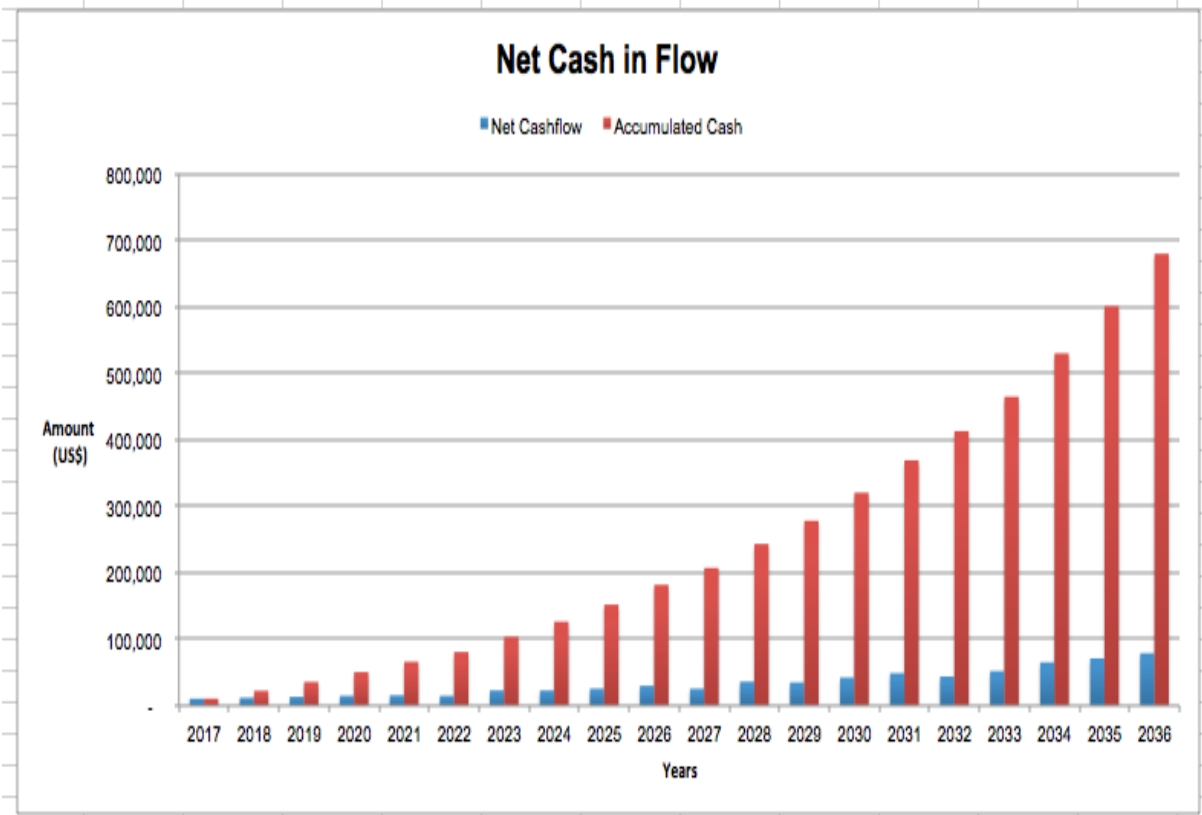


Figure 19: Net Cash Flow for Nguluwe Solar Energy Kiosk

#### 4.5.5.2.3 Statement of Financial Position (Balance Sheet)

The same depreciation policy for the other Solar Energy Kiosks applies to Mwalija Solar Energy Kiosk. A huge capital outlay is expected after 2036 as equipment and plant, which forms a significant component of the total asset value, will be fully depreciated by 2036 and will need to be either replaced or overhauled. Refer to **Appendix 7.4.2** for the Statement of Financial Position. **Table 15** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant & Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

**Table 18: Net Book Value of Assets for Nguluwe Solar Kiosk**

#### 4.5.5.2.4 Investment Appraisal

##### a) Financial Ratio Analysis

The Net Profit Margin for Nguluwe Solar Energy Kiosk is expected to increase from 45% to 75%, which is indicative of the potential viability of the business. The business return on capital employed is expected to decrease from 12% from 2017 to 11% 2036 not necessarily because of poor performance but rather because of the increase in asset base as a result of accumulation of cash as there will be no dividend pay-outs. The cash reserve is expected to decrease in 2036 /2037 as the fully depreciated equipment and plant will need to be overhauled or replaced. Table 13 below shows the financial ratios for the twenty-year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	45%	48%	51%	54%	56%	66%	68%	61%	69%	69%	70%	70%	68%	68%	72%	73%	70%	74%	74%	75%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%
<b>Return on Assets (ROA)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%

**Table 19: Financial Ratio Nguluwe Solar Kiosk**

**b) Net Present Value (NPV)**

A discount factor of 24% was used to calculate the present value of future cash inflows into the business. The discount factor is based on the Reserve Bank of Malawi’s base lending rate. A Positive Net Present Value of US\$20,449 was obtained after discounting the net cash inflows for twenty years. This implied that Nguluwe Solar Energy Kiosk would be viable business venture within twenty years of operations.

Discount factor was computed using a formula,  $1/(1+R)^n$  where r is base lending rate and n represent the number of years.

Net Present Value																					
Years	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(52,207)																				
Net Cash Inflow		10,530	11,822	13,243	14,806	15,526	14,759	22,865	22,762	25,530	29,824	25,433	36,080	34,918	42,189	48,766	43,722	51,903	65,130	71,053	78,771
Discount Factor (24%)	1.0000	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397	0.0320	0.0258	0.0208	0.0168	0.0135
<b>Net Present Value</b>	<b>(52,207)</b>	<b>8,492</b>	<b>7,688</b>	<b>6,946</b>	<b>6,263</b>	<b>5,296</b>	<b>4,060</b>	<b>5,072</b>	<b>4,072</b>	<b>3,683</b>	<b>3,470</b>	<b>2,386</b>	<b>2,730</b>	<b>2,131</b>	<b>2,076</b>	<b>1,935</b>	<b>1,399</b>	<b>1,340</b>	<b>1,356</b>	<b>1,193</b>	<b>1,066</b>
<b>Total NPV</b>	<b>20,449</b>																				

**Table 20: Net Present Value Table Nguluwe**

**c) Payback period**

The initial investment in Nguluwe Solar Energy Kiosk is expected to have a pay back period of more than 5.89 years. Refer **Appendix 7.4.4**

**d) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 25.90%<sup>8</sup>, which is greater than the base bank-lending rate of 24% for the Reserve Bank of Malawi and base-lending rate of commercial bank of 32%<sup>9</sup>. The result is indicative that the investors will be able to recoup their investment in the business within 20 years.

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<sup>8</sup>  $IRR = L + \{(NPV_1 / (NPV_1 - NPV_2)) \times (H - L)$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

<sup>9</sup> 32% is the National Bank of Malawi base lending rate effective 1<sup>st</sup> December 2016

## 4.5.6 Economic and Financial Viability of Nyanthana Solar Kiosk

### 4.5.6.1 Assumptions

The same assumptions that applied to the other Solar Energy Kiosks are applicable to Nyanthana Solar Energy Kiosk.

### 4.5.6.2 Financial Statements

#### 4.5.6.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales will increase from US\$16,017 in 2017 to US\$97,957 in 2036 while profit will increase from US\$7,231 in 2017 to US\$73,345 in 2036. Refer to **Appendix 7.4.1** for the Statement of Comprehensive Income. Figure 14 below shows the increase in revenue, operating costs and profit of the Solar Kiosk within a twenty-year period.

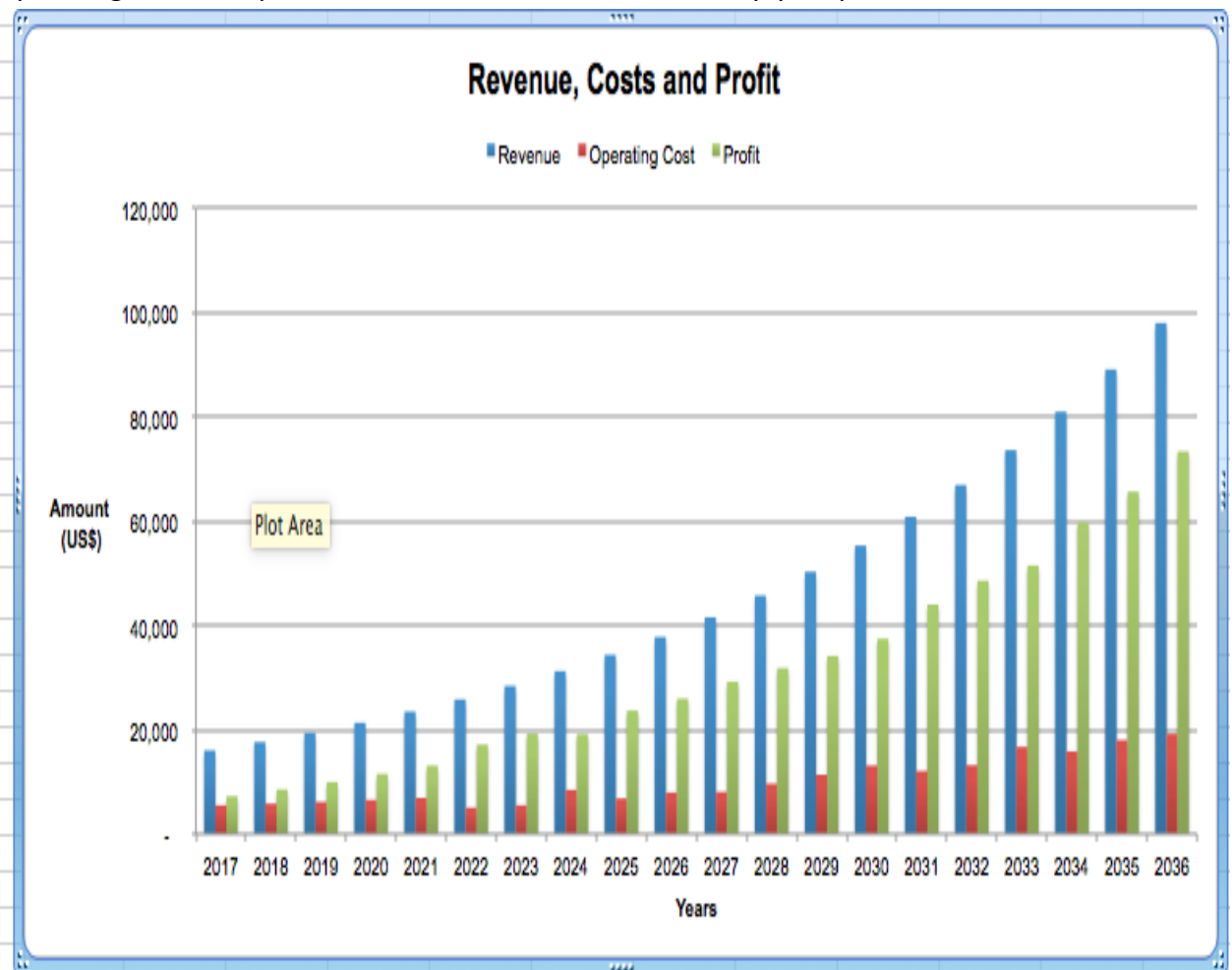
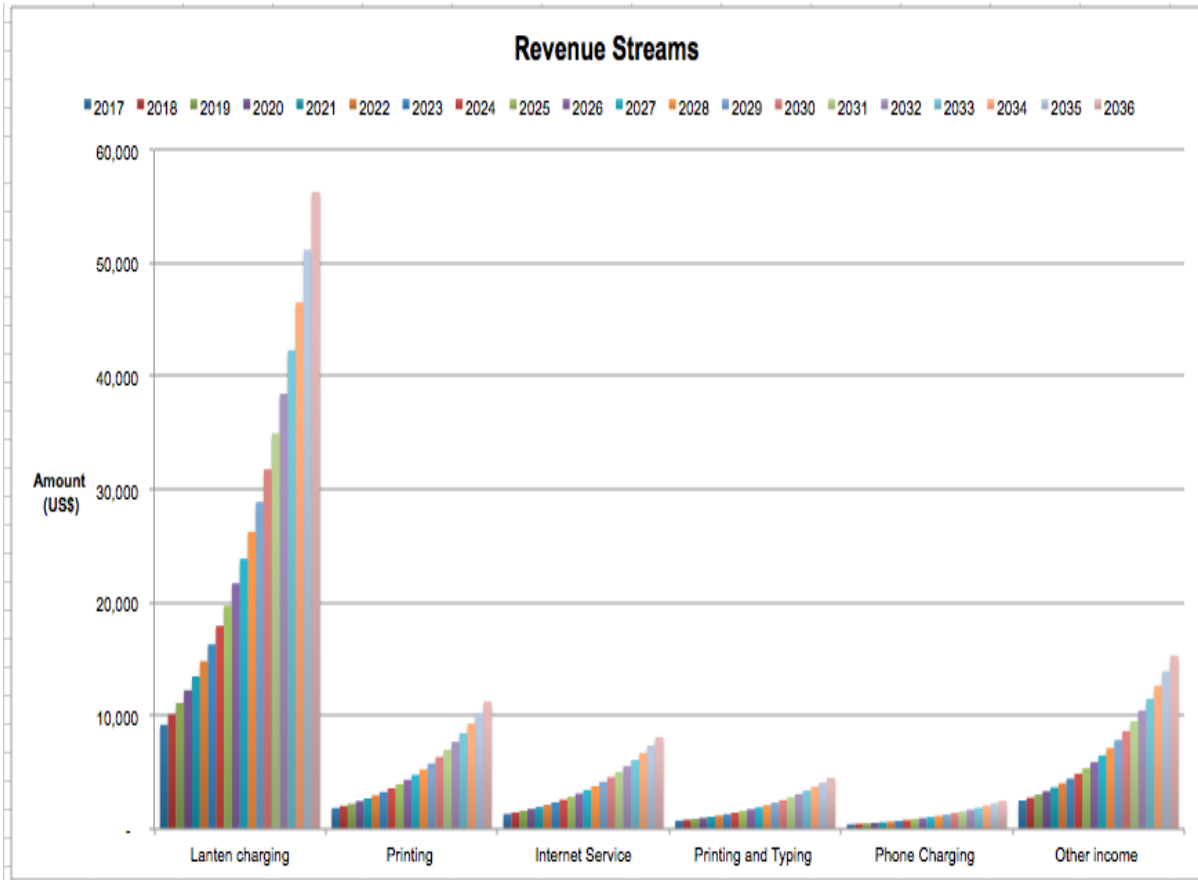


Figure 20: Revenue Cost and Profit Nyanthana Solar Kiosk

**Figure 14** below shows the different revenue streams for Nyanthana Solar Energy Kiosk.



**Figure 21: Revenue Streams for Mwalija Solar Energy Kiosk**

**4.5.6.2.2 Statement of Cash flows (Cash flow Statement)**

Nyanthana Solar Energy Kiosk is expected to receive a grant of US\$52,207, which will be used to procure assets and construct an office. The Net cash flow for the Nyanthana Solar Energy Kiosk is expected to increase from US\$10,530 in 2017 to US\$78,771 in 2036 while the accumulated cash flow will increase from US\$10,613 in 2017 to US\$600,859 in 2036. Accumulative cash will increase as it is expected that only computers and furniture and fitting will be replaced using retained earnings while the rest of the net profit will be maintained as reserves. Refer to **Appendix 7.4.3** for Statement of Cash flows.

**Figure 16** below shows the projected increase in net cash flow over the twenty-year period.

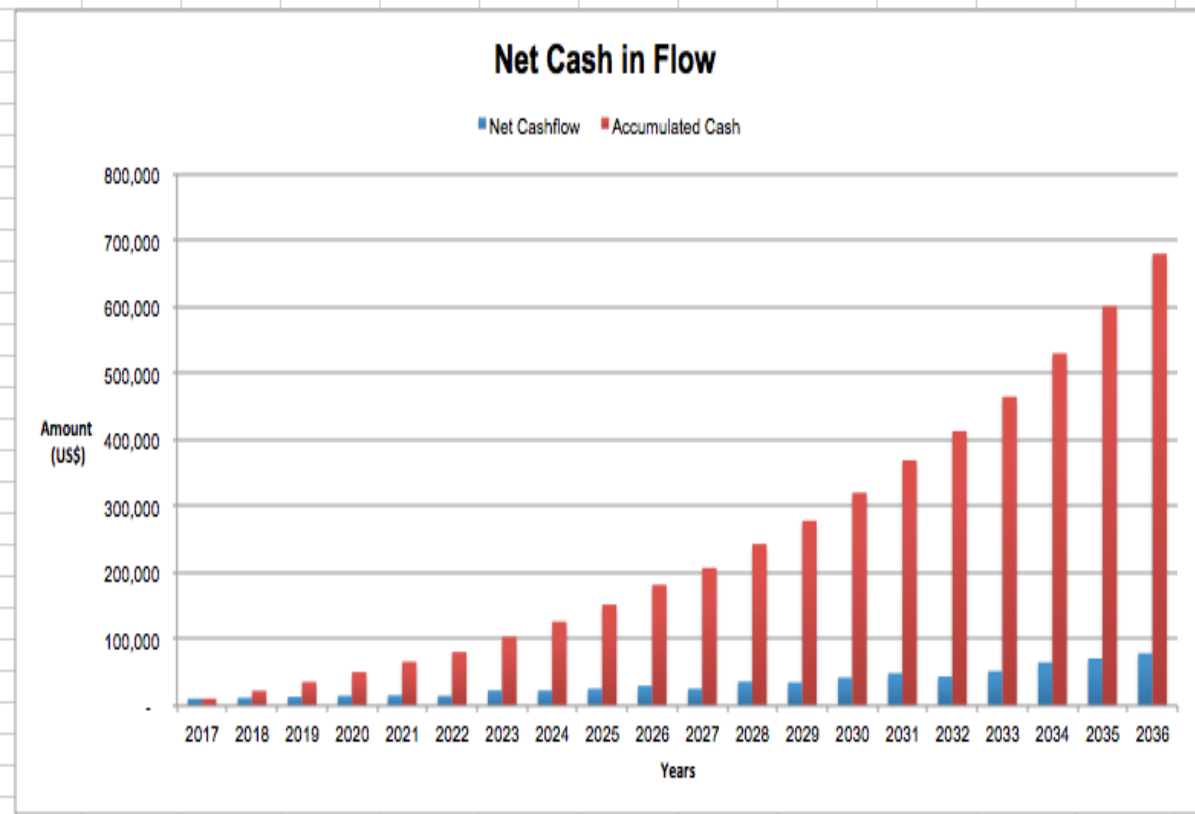


Figure 22: Net Cash Flow for Nyanthana Solar Energy Kiosk

#### 4.5.6.2.3 Statement of Financial Position (Balance Sheet)

The same depreciation policy for the other Solar Energy Kiosks applies to Mwalija Solar Energy Kiosk. A huge capital outlay is expected after 2036 as equipment and plant, which forms a significant component of the total asset value, will be fully depreciated by 2036 and will need to be either replaced or overhauled. Refer to **Appendix 7.4.2** for the Statement of Financial Position. **Table 15** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
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Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture & fittings	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Net Book Value</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>

**Table 21: Net Book Value of Assets for Nyanthana Solar Kiosk**

#### 4.5.6.2.4 Investment Appraisal

##### a) Financial Ratio Analysis

The Net Profit Margin for Nyanthana Solar Energy Kiosk is expected to increase from 45% to 75%, which is indicative of the potential viability of the business. The business return on capital employed is expected to decrease from 12% from 2017 to 11% 2036 not necessarily because of poor performance but rather because of the increase in asset base as a result of accumulation of cash as there will be no dividend pay-outs. The cash reserve is expected to decrease in 2036 /2037 as the fully depreciated equipment and plant will need to be overhauled or replaced. Table 13 below shows the financial ratios for the twenty-year period.

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<b>Net Profit Margins</b>	45%	48%	51%	54%	56%	66%	68%	61%	69%	69%	70%	70%	68%	68%	72%	73%	70%	74%	74%	75%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%
<b>Return on Assets (ROA)</b>	12%	13%	13%	13%	13%	14%	14%	12%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	11%	11%

**Table 22: Financial Ratio Nyanthana Solar Kiosk**

**b) Net Present Value (NPV)**

A discount factor of 24% was used to calculate the present value of future cash inflows into the business. The discount factor is based on the Reserve Bank of Malawi’s base lending rate. A Positive Net Present Value of US\$20,449 was obtained after discounting the net cash inflows for twenty years. This implied that Nyanthana Solar Energy Kiosk would be viable business venture within twenty years of operations.

Discount factor was computed using a formula,  $1/(1+R)^n$  where r is base lending rate and n represent the number of years.

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Discount Factor (24%)	1.0000	0.8065	0.6504	0.5245	0.4230	0.3411	0.2751	0.2218	0.1789	0.1443	0.1164	0.0938	0.0757	0.0610	0.0492	0.0397	0.0320	0.0258	0.0208	0.0168	0.0135
<b>Net Present Value</b>	<b>(52,207)</b>	<b>8,492</b>	<b>7,688</b>	<b>6,946</b>	<b>6,263</b>	<b>5,296</b>	<b>4,060</b>	<b>5,072</b>	<b>4,072</b>	<b>3,683</b>	<b>3,470</b>	<b>2,386</b>	<b>2,730</b>	<b>2,131</b>	<b>2,076</b>	<b>1,935</b>	<b>1,399</b>	<b>1,340</b>	<b>1,356</b>	<b>1,193</b>	<b>1,066</b>
<b>Total NPV</b>	<b>20,449</b>																				

**Table 23: Net Present Value Table Nyanthana**

**c) Payback period**

The initial investment in Nyanthana Solar Energy Kiosk is expected to have a pay back period of more than 5.89 years. Refer **Appendix 7.4.4**

**d) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 25.90%<sup>10</sup>, which is greater than the base bank-lending rate of 24% for the Reserve Bank of Malawi and base-lending rate of commercial bank of 32%<sup>11</sup>. The result is indicative that the investors will be able to recoup their investment in the business within 20 years.

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<sup>10</sup>  $IRR = L + \{(NPV_1 / (NPV_1 - NPV_2))\} \times (H - L)$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

<sup>11</sup> 32% is the National Bank of Malawi base lending rate effective 1<sup>st</sup> December 2016

## 4.6 Economic and Financial Viability of Minigrids

### 4.6.1 Economic and Financial Viability of Nyamvuu Minigrid

#### 4.6.1.1 Assumptions

The financial model for Nyamvuu Minigrid has been developed using the following assumptions:

- The current project beneficiaries will remain unconnected to the main power grid.
- The initial beneficiaries for the project are 300
- There will be an annual increase in revenue by 10%
- Exchange rate of MK717 per dollar will remain constant
- Lantern, battery, printing and phone charging will be the main revenue streams for the business.
- There will be debtors and creditors period of 30 days
- There will be an annual increase in operating cost of 10%
- The Kiosk will operate as a social enterprise registered as a Limited Company by Guarantee hence not liable to remit corporate tax to Malawi Revenue Authority
- The Kiosk will employ two full time staff
- The discount factor for computing the Net Present Value will be 24%. This represent the risk free rate or lending rate of the Reserve Bank of Malawi
- The project will provide capital grant to the minigrid in form of assets worth US\$ 280, 144, which will be capitalized.
- Repairs and maintenance has been estimated at 2% of the total cost of assets. This shall mainly relate to replacement cost of solar batteries.

#### 4.6.1.2 Financial Statements

Using the above assumptions, a conservative approach was adopted in developing the financial model for the minigrid because of the poor economic status of the targeted project beneficiaries and the time expected to raise awareness and stimulate the demand for renewable energy. The financial model comprise of the three main sets of financial statements namely:

- a) Statement of Comprehensive Income (formerly known as Profit and Loss Account)
- b) Statement of Financial Position (formerly known as Balance Sheet)
- c) Statement of Cash Flows (formerly known as Cashflow Statement)

##### 4.6.1.2.1 Statement of Comprehensive Income (Profit and Loss Account)

It is projected that as the per capita income of households increases due to increased agricultural productivity and access to profitable markets, the demand for the minigrid will consequently increase which will result into the increase in revenue and later alone profits realised by the minigrid. Minigrid sales are expected to increase from US\$49,120 in 2017 to US\$300,414 in 2036 while profit will increase from US\$33,655 in 2017 to US\$269,082 in 2036. Refer to **Appendix 7.5.1** for the Statement of Comprehensive Income.

It is envisaged that the installation of the minigrid at Nyamvuu will spur the development of a number of small and medium enterprises that will require energy from the minigrid. As income levels of the target group improves, the demand for solar energy will increase. It is for this basis that 10% annual increase in revenue has been projected.

The main operational costs for the minigrid have been projected to be salaries for the two full time staff, insurance, transport, communication, repairs and maintenance. Repairs and maintenance costs will mainly relate to the annual repairs that will be carried to elongate the lifespan of the minigrid. Battery replacement will constitute the larger component of the repairs and maintenance cost. Assets will be depreciated using the straight-line method over the five-year initial project life.

**Figure 23** below shows the increase in revenue, operating costs and profit of the minigrid within a five-year period.

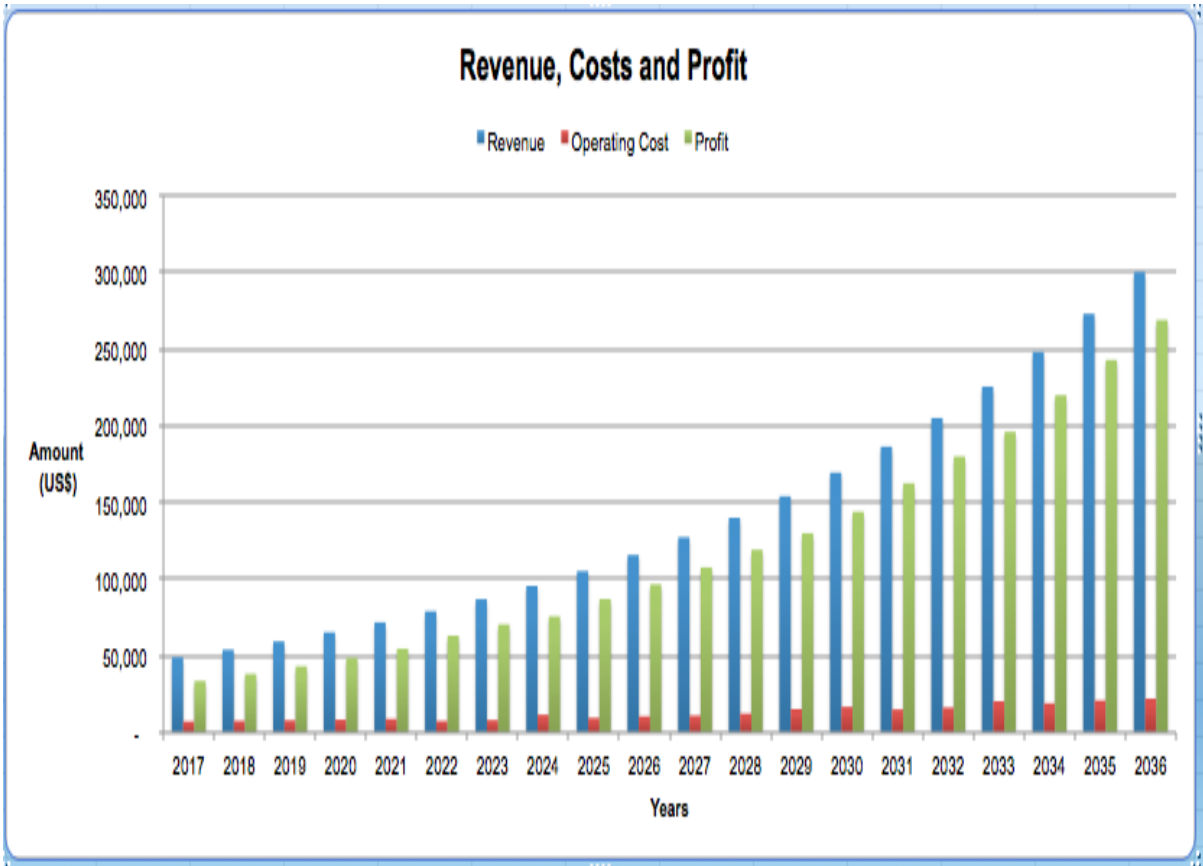


Figure 23: Revenue, Cost and Profit of Nyamvuu Minigrid

4.6.1.2.2 Statement of Cash flows (Cash flow Statement)

Nyamvuu is expected to receive a grant of US\$280, 144 that will be used to construct a building valued at US\$36,785 and procure equipment and other materials valued at US\$242,819.35 and US\$540 for computer and furniture. As a start up, any profit realized within the first twenty years of the business will be retained to finance organic growth of the business. Net cash flow for the Nyamvuu Minigrid is expected to increase from US\$41,936 in 2017 to US\$278,226 in 2021 while the accumulated cash flow will increase from US\$41,936 in 2018 to US\$2,266,750 in 2036. Accumulative cash will increase as it is expected that only computers and furniture and fittings will be replaced using retained earnings. Refer to **Appendix 7.5.3** for Statement of Cash flows

**Figure 24** below shows the projected increase in net cash flow over the five-year period.

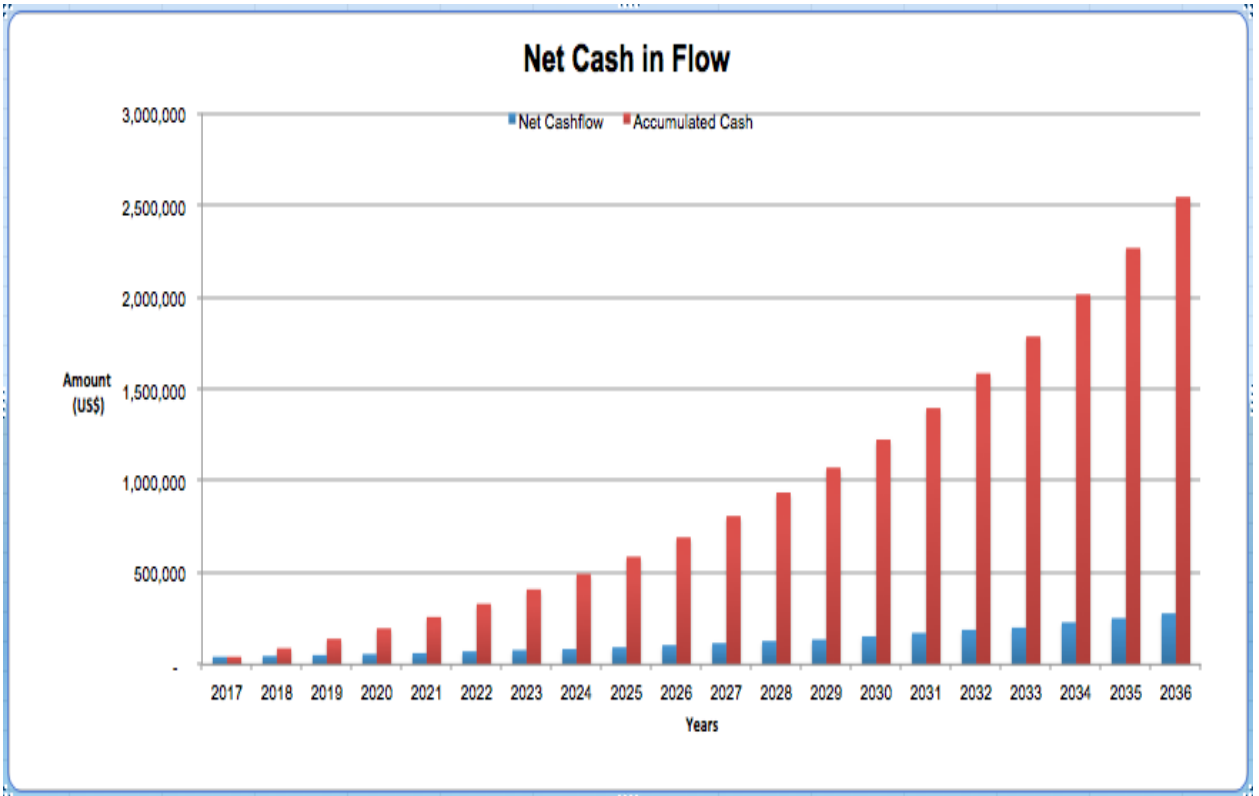


Figure 24: Net Cash Flow for Nyamvuu Minigrid

4.6.1.2.3 Statement of Financial Position (Balance Sheet)

The same fixed assets management policy for the solar energy kiosk is applicable for the minigrid. Refer to **Appendix 7.5.2** the Statement of Financial Position. The Net Book Value of fixed assets will continue over the years as equipment and plant and land which are the major assets have a longer lifespan compared to computers and furniture which will be fully depreciated before the lapse of the 20 year period.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & building	36,049	35,314	34,578	33,842	33,107	32,371	31,635	30,900	30,164	29,428	28,692	27,957	27,221	26,485	25,750	25,014	24,278	23,542	22,807	22,071
Plant & Equipment	235,535	228,250	220,965	213,681	206,396	199,112	191,827	184,543	177,258	169,973	162,689	155,404	148,120	140,835	133,551	126,266	118,981	111,697	104,412	97,128
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture & fittings	38	34	29	28	24	20	16	11	7	3	57	50	44	38	31	25	19	13	6	-
<b>Total Net Book Value</b>	<b>271,995</b>	<b>263,846</b>	<b>255,697</b>	<b>247,551</b>	<b>240,277</b>	<b>232,002</b>	<b>223,728</b>	<b>215,453</b>	<b>208,929</b>	<b>200,404</b>	<b>191,938</b>	<b>183,411</b>	<b>177,635</b>	<b>168,858</b>	<b>160,082</b>	<b>151,305</b>	<b>146,653</b>	<b>137,502</b>	<b>128,350</b>	<b>119,199</b>

Table 24 below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land & building	36,049	35,314	34,578	33,842	33,107	32,371	31,635	30,900	30,164	29,428	28,692	27,957	27,221	26,485	25,750	25,014	24,278	23,542	22,807	22,071
Plant & Equipment	235,535	228,250	220,965	213,681	206,396	199,112	191,827	184,543	177,258	169,973	162,689	155,404	148,120	140,835	133,551	126,266	118,981	111,697	104,412	97,128
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture & fittings	38	34	29	28	24	20	16	11	7	3	57	50	44	38	31	25	19	13	6	-
<b>Total Net Book Value</b>	<b>271,995</b>	<b>263,846</b>	<b>255,697</b>	<b>247,551</b>	<b>240,277</b>	<b>232,002</b>	<b>223,728</b>	<b>215,453</b>	<b>208,929</b>	<b>200,404</b>	<b>191,938</b>	<b>183,411</b>	<b>177,635</b>	<b>168,858</b>	<b>160,082</b>	<b>151,305</b>	<b>146,653</b>	<b>137,502</b>	<b>128,350</b>	<b>119,199</b>

Table 24: Net Book Value of Assets for Nyamvuu Minigrid

#### 4.6.1.2.4 Investment Appraisal

As for the solar energy kiosk, financial ratios, Payback Period, Net Present Value (NPV) and the internal rate of return (IRR) have used to assess the commercial viability of Nyamvuu Minigrid. Due to the huge initial capital outlay for the minigrid, there is needed to earn high-income levels if the minigrid is to become commercially viable. Both the NPV and IRR shows lower results and the payback period is longer is five years.

#### a) Financial Ratio Analysis

The Net Profit Margin and Return on Capital Employed have used to assess the profitability and shareholders return on investment respectively. Both the ratios indicate positive outlook of the investment.

Table 25 below shows the financial ratios for the twenty-year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	69%	71%	73%	75%	76%	80%	81%	79%	83%	83%	85%	85%	84%	85%	87%	88%	87%	89%	89%	90%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	10%	10%	10%	10%	10%	10%	10%	10%
<b>Return on Assets (ROA)</b>	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	10%	10%	10%	10%	10%	10%	10%	10%

Table 25: Financial Ratio Nyamvuu Minigrid

**b) Net Present Value (NPV)**

A Positive NPV of US\$1,115 is obtained after discounting the net cashflows of the business using a discount factor of 24% in the first twenty years of operation. Though this would indicate that the business is commercially not viable, the social benefits of the investment are expected to be far much more than the monetary benefits. In order to improve the commercial viability of the business, there will be need to diversify the income stream for the minigrid e.g. hammer mill.

Additionally, in computing the NPV, the increase in income from crop production as a result of the minigrid was not taken into account due in the absence of the information.

**Table 26** below shows the Net Present Value for Nyamvuu Minigrid

Description	Years																				
Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(280,144)																				
Net Cash Inflow		41,936	46,354	51,374	56,902	61,993	71,513	78,822	84,078	93,664	105,194	116,218	127,733	135,797	152,779	171,417	188,866	200,787	229,167	252,155	278,226
Discount Factor ( 24%)	1	0.81	0.65	0.52	0.42	0.34	0.28	0.22	0.18	0.14	0.12	0.09	0.08	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.01
Net Present Value	(280,144)	33,820	30,147	26,945	24,068	21,146	19,672	17,486	15,042	13,514	12,240	10,905	9,666	8,287	7,519	6,803	6,045	5,183	4,770	4,233	3,767
<b>Total NPV</b>	<b>1,115</b>																				

**Table 26: Net Present Value for Nyamvuu Minigrid**

**c) Payback period**

The project business performance indicates that the payback period for Nyamvuu Minigrid is expected to be 6 years. Refer **Appendix 7.5.4**

**d) Internal Rate of Return**

The investment in the business will give an Internal Rate of Return (IRR) of 24.07%<sup>12</sup>, which is less than the base bank-lending rate of 24% for the Reserve Bank of Malawi. The lower IRR indicates that the investors will have to wait for more than 5 years to recoup on the initial investment made.

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<sup>12</sup>  $IRR = L + \left\{ \frac{NPV_1}{(NPV_1 - NPV_2)} \right\} \times (H - L)$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

## 4.6.2 Economic and Financial Viability of Oleole Minigrid

### 4.6.2.1 Assumptions

Except for a few assumptions detailed below, the same assumptions for Nyamvuu Minigrid to Oleole Minigrid.

- The initial beneficiaries for the project are 800
- The project will provide capital grant to the minigrid in form of assets worth US\$ 235,690, which will be capitalized.

### 4.6.2.2 Financial Statements

#### 4.6.2.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Minigrid sales for Oleole are projected to increase from US\$56,540 in 2017 to US\$345,793 in 2036 while profit is projected to increase from US\$43,771 in 2017 to US\$318,187 in 2036. As is the case with Nyamvuu, it is expected that the installation of Oleole Minigrid will bring about economic growth of the area, which will stimulate the demand for more energy. This is the reason revenue is expected to increase over the years by 10%. Refer to **Appendix 7.6.1** for the Statement of Comprehensive Income. **Figure 25** below shows the increase in revenue, operating costs and profit of the minigrid within a twenty-year period.

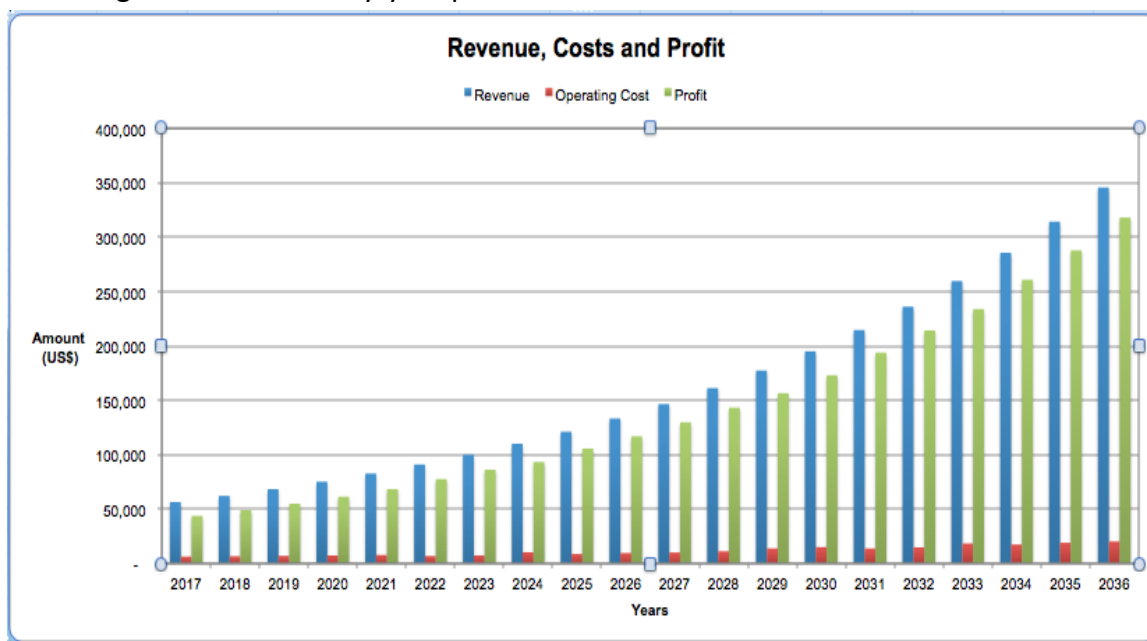
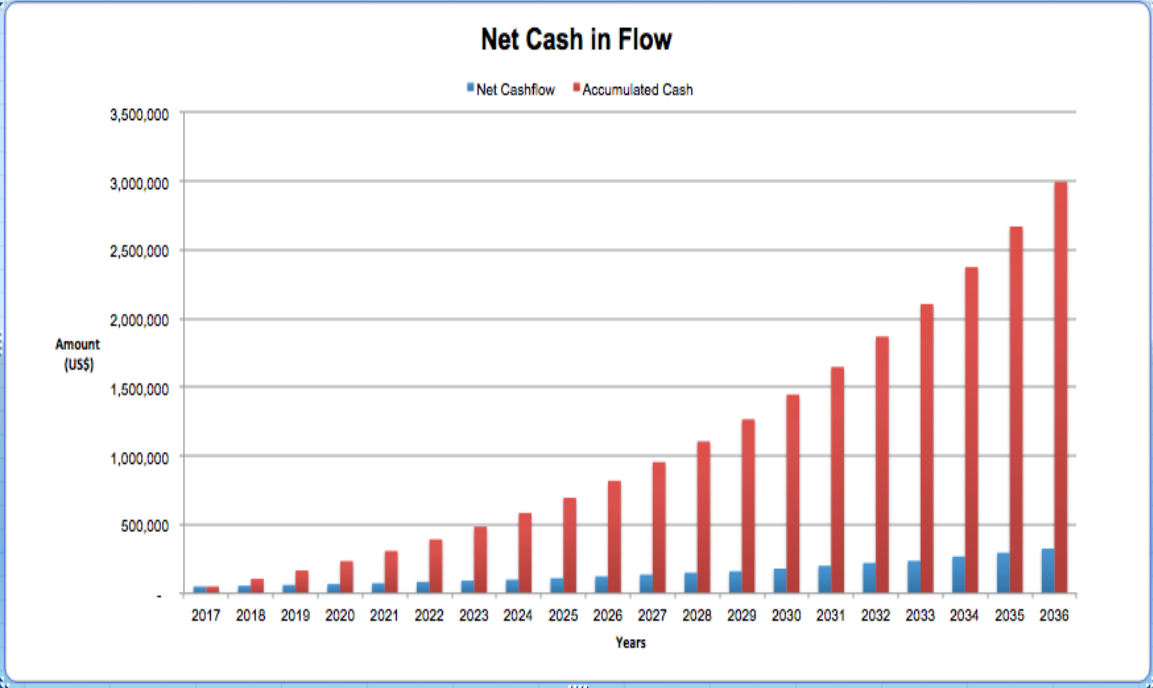


Figure 25: Revenue, Cost and Profit for Oleole Minigrid

#### 4.6.2.2.2 Statement of Cash flows (Cash flow Statement)

Oleole Minigrid will receive a total capital grant of US\$235,690, which will comprise US\$84,142.78 for building, US\$151,008 for equipment and US\$540 for computer and furniture. On the other hand, the Net cash flow for the Oleole Minigrid is expected to increase from US\$50,245 in 2017 to US\$325,524 in 2036 while the accumulated cash flow will increase from US\$28,183 in 2018 to US\$2,668,968 in 2036 as a result of

retained earnings. Refer to **Appendix 7.6.3** for Statement of Cash flows. **Figure 26** below shows the projected increase in net cash flow over the twenty-year period.



**Figure 26: Net Cash Flow for Oleole Minigrd**

#### 4.6.2.2.3 Statement of Financial Position (Balance Sheet)

The Total Net Book Value of the assets will decrease from US\$229,349 in 2017 to US\$110,889 in 2036 because of wear and tear of the assets while in use. The **Table 27** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land and building	82,460	80,777	79,094	77,411	75,729	74,046	72,363	70,680	68,997	67,314	65,631	63,949	62,266	60,583	58,900	57,217	55,534	53,851	52,169	50,486
Plant and Equipment	146,477	141,947	137,417	132,887	128,356	123,826	119,296	114,766	110,236	105,705	101,175	96,645	92,115	87,584	83,054	78,524	73,994	69,463	64,933	60,403
Computer	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	3	57	50	44	38	31	25	19	13	6	-
<b>Total Net Book Value</b>	<b>229,349</b>	<b>223,007</b>	<b>216,665</b>	<b>210,326</b>	<b>204,859</b>	<b>198,392</b>	<b>191,924</b>	<b>185,457</b>	<b>180,740</b>	<b>174,022</b>	<b>167,363</b>	<b>160,644</b>	<b>156,674</b>	<b>149,705</b>	<b>142,736</b>	<b>135,766</b>	<b>132,922</b>	<b>125,577</b>	<b>118,233</b>	<b>110,889</b>

**Table 27: Net Book Value of Assets for Oleole Minigrid**

Refer to **Appendix 7.6.2** for the Statement of Financial Position

#### 4.6.2.2.4 Investment Appraisal

Financial ratios, Payback Period, Net Present Value (NPV) and the Internal Rate of Return (IRR) have been used to assess the robustness of the financial model and gave more less the same results as of Nyamvuu Minigrid.

#### a) Financial Ratio Analysis

**Table 28** below shows the financial ratios for the twenty-year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	77%	79%	80%	82%	83%	85%	86%	85%	87%	88%	88%	89%	88%	89%	90%	91%	90%	91%	92%	92%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	16%	15%	14%	14%	13%	13%	13%	12%	12%	12%	12%	11%	11%	11%	11%	11%	10%	10%	10%	10%
<b>Return on Assets (ROA)</b>	16%	15%	14%	14%	13%	13%	13%	12%	12%	12%	12%	11%	11%	11%	11%	11%	10%	10%	10%	10%

**Table 28: Financial Ratio Oleole Minigrid**

#### b) Payback period

Based on the assumptions used, the investment in Oleole Minigrid is expected to take 4.39 years to recoup the initial capital investment. Refer **Appendix 7.6.4**

#### c) Net Present Value (NPV)

As shown in the table below, Oleole Minigrid yields a Positive NPV of US\$97,718 meaning that Oleole Minigrid will be commercially viable within twenty years of operations.

**Table 29** below shows the Net Present Value for the Oleole Minigrid

Net Present Value																					
Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(235,690)																				
Net Cash Inflow		50,245	55,440	61,315	67,783	73,905	84,116	92,672	99,744	110,410	123,651	136,423	150,029	160,557	180,048	200,900	221,271	236,848	268,334	295,276	325,524
Discount Factor ( 24%)	1	0.81	0.65	0.52	0.42	0.34	0.28	0.22	0.18	0.14	0.12	0.09	0.08	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.01
Net Present Value	(235,690)	40,520	36,056	32,159	28,670	25,210	23,139	20,559	17,845	15,930	14,387	12,801	11,353	9,798	8,861	7,974	7,082	6,114	5,586	4,957	4,407
<b>TOTAL NPV</b>	<b>97,718</b>																				

**Table 29: Net Present Value of Oleole Minigrid**

**d) Internal Rate of Return**

The Internal Rate of Return (IRR) of 24.91%<sup>13</sup> gives similar results to the NPV. NPV shows that the investment in Oleole will be commercially viable.

<sup>13</sup>  $IRR = L + \left\{ \frac{NPV_1}{(NPV_1 - NPV_2)} \right\} \times (H-L)$  where L is the lower rate of return, H is the higher rate of return, NPV<sub>1</sub> is the Net Present Value for the lower rate of return while NPV<sub>2</sub> is the Net Present Value for the higher rate of return

### 4.6.3 Economic and Financial Viability of Chimombo Minigrid

#### 4.6.3.1 Assumptions

Except for a few assumptions detailed below, the same assumptions for other minigrids apply to Chimombo Minigrid too.

- The initial beneficiaries for the project are 600
- The project will provide capital grant to the minigrid in form of assets worth US\$ 157,164 that will be capitalized.

#### 4.6.3.2 Financial Statements

##### 4.6.3.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales for Chimombo Minigrid are projected to increase from US\$54,112 in 2017 to US\$330,942 in 2036 which will result in the increase in projected profit from US\$44,846 in 2017 to US\$308,658 in 2036 as the demand for solar energy increases. **Figure 27** below shows the increase in revenue, operating costs and profit of the minigrid within a twenty-year period.

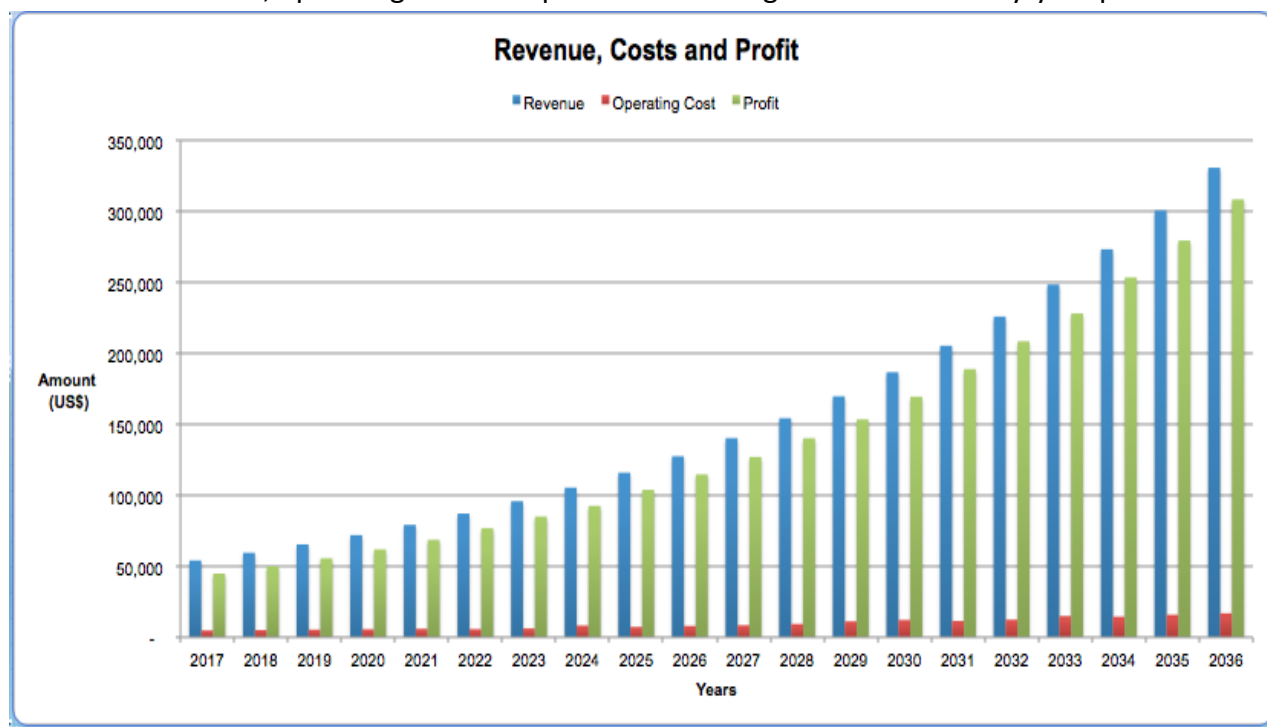


Figure 27: Revenue, Cost and Profit for Chimombo Minigrid

Refer to **Appendix 7.7.1** for the Statement of Comprehensive Income.

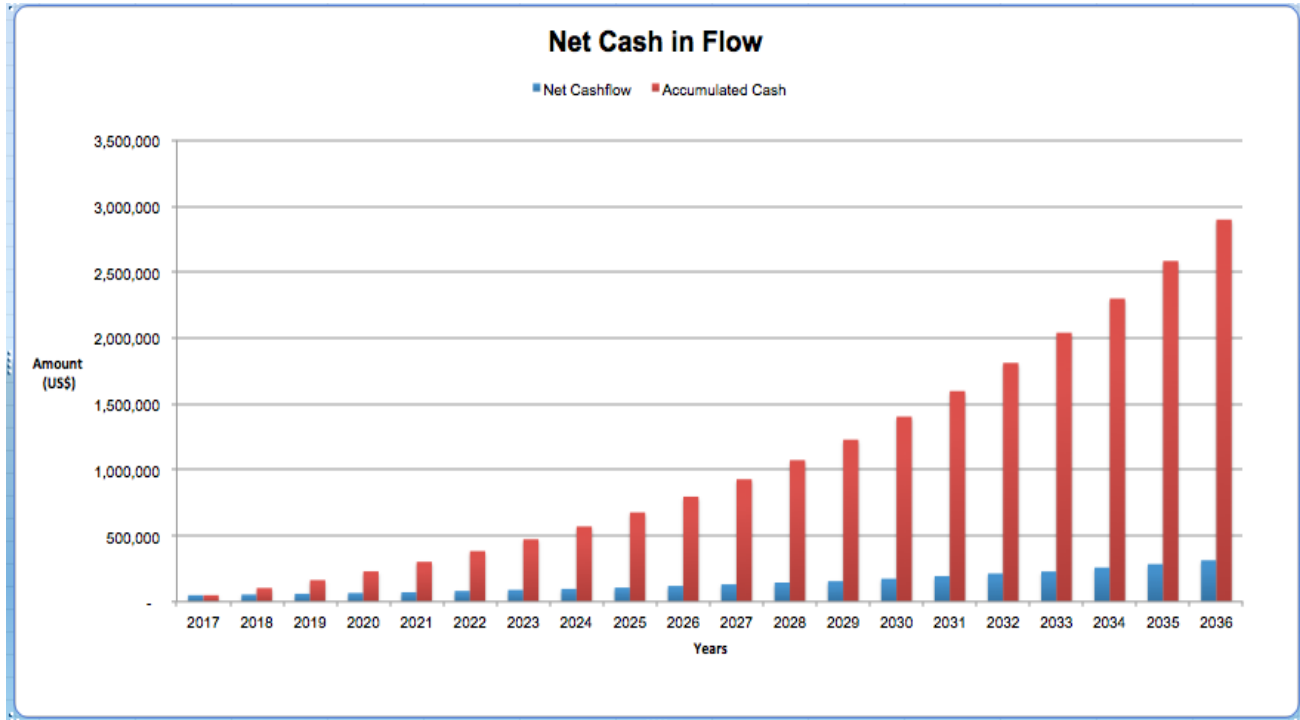
##### 4.6.3.2.2 Statement of Cash flows (Cash flow Statement)

Chimombo Minigrid will receive a capital grant of US\$157,164 of which US\$41,878.82 will be for the building and US\$114,745 for equipment and other materials.

The Net cash flow is expected to increase from US\$49,387 in 2017 to US\$314,062 in 2036 while the accumulated cash flow will increase from US\$49,387 in 2018 to US\$2,584,567 in 2036.

Refer to **Appendix 7.7.3** for Statement of Cash flows

**Figure 28** below shows the projected increase in net cash flow over the five-year period.



**Figure 28: Net Cash Flows for Chimombo Minigrid**

#### 4.6.3.2.3 Statement of Financial Position (Balance Sheet)

The Total Net Book Value of the assets will decrease from US\$152,755 in 2017 to US\$71,025 in 2036 because of wear and tear of the assets while in use Refer to **Appendix 7.7.3** for the Statement of Financial Position. **Table 30** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land and building	41,041	40,204	39,366	38,529	37,691	36,853	36,016	35,178	34,341	33,503	32,665	31,828	30,990	30,153	29,315	28,478	27,640	26,802	25,965	25,127
Plant and Equipment	111,302	107,860	104,418	100,975	97,533	94,091	90,648	87,206	83,764	80,321	76,879	73,437	69,994	66,552	63,110	59,667	56,225	52,783	49,340	45,898
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	3	57	50	44	38	31	25	19	13	6	-
<b>Total Net Book Value</b>	<b>152,755</b>	<b>148,346</b>	<b>143,938</b>	<b>139,532</b>	<b>135,998</b>	<b>131,464</b>	<b>126,930</b>	<b>122,396</b>	<b>119,611</b>	<b>114,827</b>	<b>110,101</b>	<b>105,315</b>	<b>103,279</b>	<b>98,242</b>	<b>93,206</b>	<b>88,170</b>	<b>87,259</b>	<b>81,848</b>	<b>76,436</b>	<b>71,025</b>

**Table 30: Net Book Value of Assets for Chimombo Minigrid**

#### 4.6.3.2.4 Investment Appraisal

Financial ratios, Payback Period, Net Present Value (NPV) and the Internal Rate of Return (IRR) have been used to assess the robustness of the financial model and gave more less the same results as of the other Minigrids.

##### a) Financial Ratio Analysis

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	83%	84%	85%	86%	87%	88%	89%	88%	90%	90%	91%	91%	90%	91%	92%	92%	92%	93%	93%	93%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	22%	20%	18%	17%	16%	15%	14%	13%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%
<b>Return on Assets (ROA)</b>	22%	20%	18%	17%	16%	15%	14%	13%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%

Table 31 below shows the financial ratios for the 5year period.

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	83%	84%	85%	86%	87%	88%	89%	88%	90%	90%	91%	91%	90%	91%	92%	92%	92%	93%	93%	93%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	22%	20%	18%	17%	16%	15%	14%	13%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%

<b>Return on Assets (ROA)</b>	22%	20%	18%	17%	16%	15%	14%	13%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%

**Table 31: Financial Ratio Chimombo Minigrid**

**b) Payback period**

The payback period for Chimombo is 4.66 years. The period is shorter compared to other minigrids because the value of investment made is lower compared to the other minigrids. Refer **Appendix 7.7.4**

**c) Net Present Value (NPV)**

As shown in the table below, Chimombo Minigrid yields a Positive NPV of US\$167,497 after discounting the net cashflow by 24%. As is the case with other minigrids, the NPV shows that the investment in the minigrid is commercially viable in the first twenty years.

**Table 32** below shows the Net Present Value for Chimombo Minigrid

Net Present Value																					
Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(157,164)																				
Net Cash Inflow		49,387	54,403	60,078	66,325	72,204	81,359	89,617	97,143	106,678	119,572	131,820	145,029	155,603	174,586	193,985	213,618	229,166	258,985	285,010	314,062
Discount Factor (24%)	1	0.81	0.65	0.52	0.42	0.34	0.28	0.22	0.18	0.14	0.12	0.09	0.08	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.01
<b>Net Present Value</b>	<b>(157,164)</b>	<b>39,829</b>	<b>35,382</b>	<b>31,510</b>	<b>28,054</b>	<b>24,629</b>	<b>22,381</b>	<b>19,881</b>	<b>17,379</b>	<b>15,391</b>	<b>13,913</b>	<b>12,369</b>	<b>10,975</b>	<b>9,496</b>	<b>8,592</b>	<b>7,699</b>	<b>6,837</b>	<b>5,915</b>	<b>5,391</b>	<b>4,785</b>	<b>4,252</b>

**Table 32: Net Present Value Table Chimombo**

**d) Internal Rate of Return**

The Internal Rate of Return (IRR) of 41.72% gives similar results to the NPV which is higher than the base lending rate hence profitable.

## 4.6.4 Economic and Financial Viability of Mwalija Minigrid

### 4.6.4.1 Assumptions

Except for a few assumptions detailed below, the same assumptions for other minigrids apply to Chimombo Minigrid too.

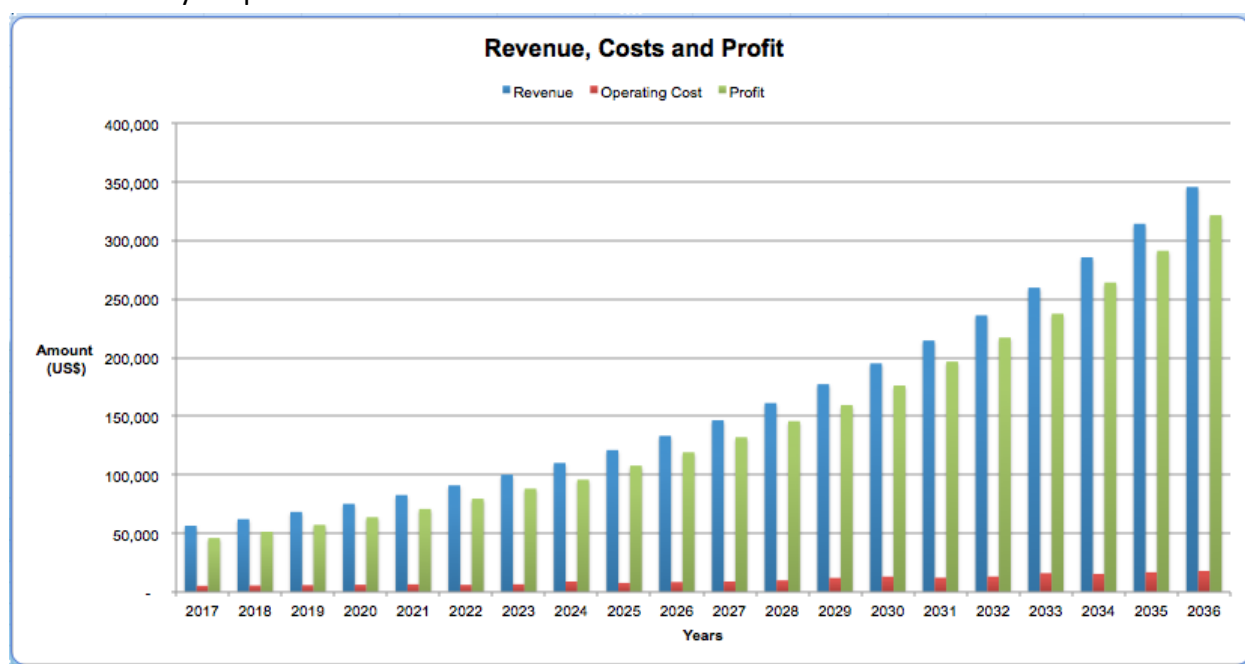
- The initial beneficiaries for the project are 800
- The project will provide capital grant to the minigrid in form of assets worth US\$ 182,737 that will be capitalized.

### 4.6.4.2 Financial Statements

#### 4.6.4.2.1 Statement of Comprehensive Income (Profit and Loss Account)

Sales for Mwalija Minigrid are projected to increase from US\$56,540 in 2017 to US\$345,793 in 2036 which will result in the increase in projected profit from US\$46,052 in 2017 to US\$321,694 in 2036 as the demand for solar energy increases.

**Figure 29** below shows the increase in revenue, operating costs and profit of the minigrid within a five-year period.



**Figure 29: Revenue Cost and Profit Mwalija Minigrid**

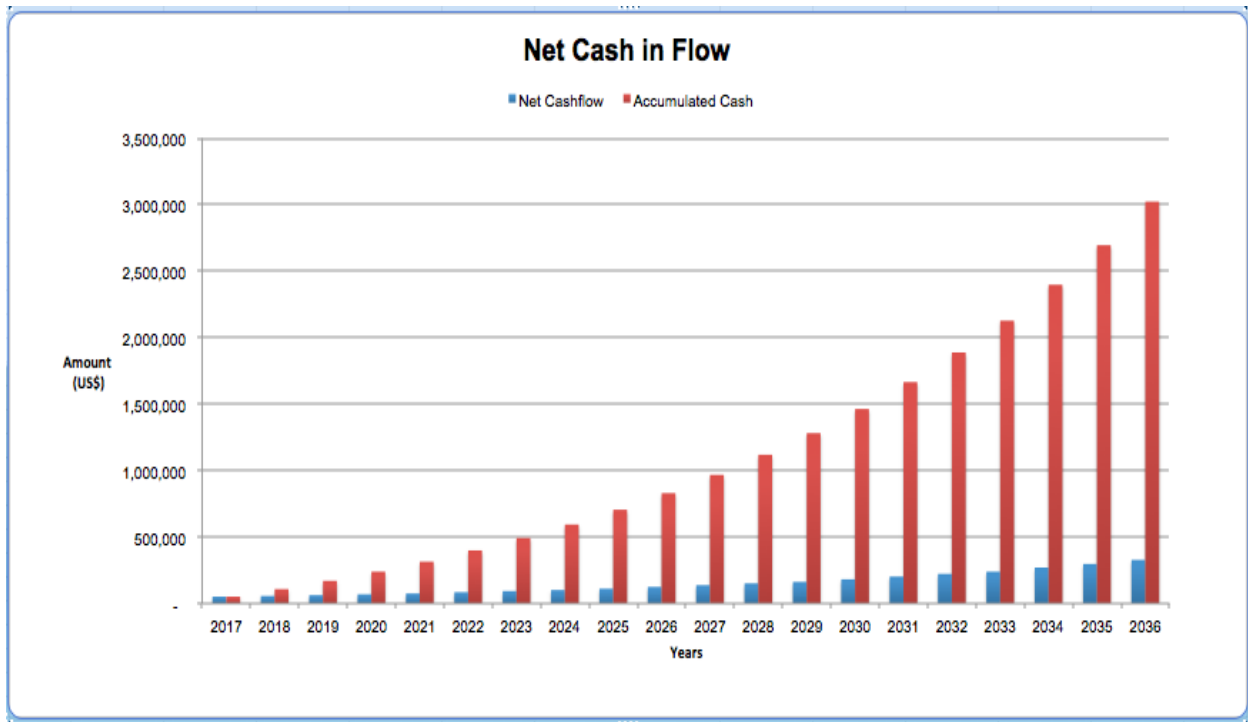
Refer to **Appendix 7.8.1** for the Statement of Comprehensive Income.

#### 4.6.4.2.2 Statement of Cash flows (Cash flow Statement)

Mwalija Minigrid will receive a capital grant of US\$182,737 of which US\$41,435.64 will be for the building and US\$134,761 for equipment and other materials. The Net cash flow is expected to increase from US\$51,304 in 2017 to US\$327,810 in 2036 while the accumulated cash flow

will increase from US\$51,304 in 2018 to US\$2,695,816 in 2036. Refer to **Appendix 7.8.3** for Statement of Cash flows

**Figure 30** below shows the projected increase in net cash flow over the five-year period.



**Figure 30: Net Cash Flow for Mwalija Minigrid**

#### 4.6.4.2.3 Statement of Financial Position (Balance Sheet)

**Table 33** below shows movement in net book value of the assets.

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Land and building	46,487	45,538	44,590	43,641	42,692	41,743	40,795	39,846	38,897	37,949	37,000	36,051	35,102	34,154	33,205	32,256	31,308	30,359	29,410	28,461
Plant and Equipment	130,718	126,676	122,633	118,590	114,547	110,504	106,461	102,419	98,376	94,333	90,290	86,247	82,204	78,162	74,119	70,076	66,033	61,990	57,947	53,904
Computer	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	3	57	50	44	38	31	25	19	13	6	-
<b>Total Net Book Value</b>	<b>177,205</b>	<b>172,214</b>	<b>167,222</b>	<b>162,231</b>	<b>157,239</b>	<b>152,248</b>	<b>147,256</b>	<b>142,264</b>	<b>137,273</b>	<b>132,281</b>	<b>127,290</b>	<b>122,298</b>	<b>117,307</b>	<b>112,315</b>	<b>107,324</b>	<b>102,332</b>	<b>97,341</b>	<b>92,349</b>	<b>87,357</b>	<b>82,366</b>

**Table 33: Net Book Value of Assets for Mwalija Minigrid**

Refer to **Appendix 7.8.2** the Statement of Financial Position

#### 4.6.4.2.4 Investment Appraisal

Financial ratios, Payback Period, Net Present Value (NPV) and the Internal Rate of Return (IRR) have been used to assess the profitability and the ability of the business to give back a return to its investors.

##### a) Financial Ratio Analysis

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	81%	83%	84%	85%	86%	87%	88%	87%	89%	89%	90%	90%	90%	90%	92%	92%	91%	92%	93%	93%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	20%	18%	17%	16%	15%	14%	14%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%	10%
<b>Return on Assets (ROA)</b>	20%	18%	17%	16%	15%	14%	14%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%	10%

Table 34 below shows the financial ratios for the 5year period

RATIO	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>Profitability Ratio</b>																				
<b>Net Profit Margins</b>	81%	83%	84%	85%	86%	87%	88%	87%	89%	89%	90%	90%	90%	90%	92%	92%	91%	92%	93%	93%
<b>Investment Ratios</b>																				
<b>Return on Capital Employed (ROCE)</b>	20%	18%	17%	16%	15%	14%	14%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%	10%
<b>Return on Assets (ROA)</b>	20%	18%	17%	16%	15%	14%	14%	13%	13%	12%	12%	12%	11%	11%	11%	11%	11%	11%	10%	10%

**Table 34: Financial Ratio Mwalija Minigrd**

**b) Payback period**

The pay back period for Mwalija Minigrd is more than 3.44 years mainly of the low initial capital investment. Refer **Appendix 7.8.4**

**c) Net Present Value (NPV)**

As shown in the table below, Mwalija Minigrd yields a Positive NPV of US\$155,403 after discounting the net cashflow by 24%.

Description	Years																				
Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(182,737)																				
Net Cash Inflow		51,304	56,542	62,462	68,979	75,155	84,894	93,513	101,181	111,402	124,758	137,566	151,325	162,359	182,018	202,455	222,950	239,192	270,305	297,453	327,810
Discount Factor (24%)	1	0.81	0.65	0.52	0.42	0.34	0.28	0.22	0.18	0.14	0.12	0.09	0.08	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.01
Net Present Value	(182,737)	41,374	36,773	32,760	29,176	25,636	23,353	20,745	18,102	16,073	14,516	12,908	11,451	9,908	8,958	8,035	7,136	6,174	5,627	4,994	4,438
<b>TOTAL NPV</b>	<b>155,403</b>																				

**Table 35 below shows the Net Present Value for Mwalija Minigrd**

Description	Years																				
Years	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Investment	(182,737)																				
Net Cash Inflow		51,304	56,542	62,462	68,979	75,155	84,894	93,513	101,181	111,402	124,758	137,566	151,325	162,359	182,018	202,455	222,950	239,192	270,305	297,453	327,810
Discount Factor (24%)	1	0.81	0.65	0.52	0.42	0.34	0.28	0.22	0.18	0.14	0.12	0.09	0.08	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.01
Net Present Value	(182,737)	41,374	36,773	32,760	29,176	25,636	23,353	20,745	18,102	16,073	14,516	12,908	11,451	9,908	8,958	8,035	7,136	6,174	5,627	4,994	4,438
<b>TOTAL NPV</b>	<b>155,403</b>																				

**Table 35: Net Present Value for Mwalija Minigrd**

**d) Internal Rate of Return**

The investment in Mwalija Minigrid gives a favourable Internal Rate of Return (IRR) of 38.47%.

## 5 Management and Ownership Model Viability

### 5.1 Knowledge skills

The solar minigrid and kiosk operators will be required to have good business management or entrepreneurial, numerical, reading and writing skills and full knowledge of solar products. The operators will have teamwork and conflict resolution and management.

### 5.2 Training

Training Need Assessment will be conducted to identify skill gaps of the Kiosk and Minigrid operators once identified and tailor made training programme will be designed to address the identified skill gaps. Some of the recommended training modules for kiosk operators include:

- Financial Management (financial recording keeping, fixed asset management, budgeting, preparation and interpretation of financial statements,
- Marketing including market research
- Business Planning
- Leadership and Governance
- Procurement
- Inventory management
- Risk Management

In order to reinforce knowledge acquired from the training and to ensure that the knowledge is put into good use, business mentorship and coaching will be carried out throughout the project life, tapering off towards the end.

### 5.3 Risk Management

The Minigrids and Kiosks are envisaged to face a number of risks, which could threaten the going concern of the business. **Table 36** below is summary of some of the risk the Solar Energy Kiosk Operators could be exposed to which have been assessed in order of impact or significance and likelihood/probability of occurrence.

#	Description of Risk	Likelihood of Occurrence	Impact	Mitigation Measures
1	Lack of funds by the target customers to pay for solar products.	High	High	Potential customers will be allowed to get the solar products on credit with a flexible repayment schedule e.g. daily or monthly rentals depending on the financial profile of the Household.

2	Theft of equipment and cash owned by the Solar Energy Kiosk. Theft is a risk as the business are far from the nearest police unit and the business will be keeping huge sums of cash	Medium	High	<ul style="list-style-type: none"> <li>• Night security guard will be employed. Windows and door will be closed with barbed and electronic wire wire.</li> <li>• All cash earned in a day will be stored in a lockable safe and deposited at the bank regularly.</li> <li>• Insurance of assets to cover them for unforeseen circumstances</li> </ul>
3	Low sales volume as a result of competition with low quality solar products available in the market	High	Medium	<ul style="list-style-type: none"> <li>• The Kiosk will raise awareness of the unique selling proposition of its solar products against fake ones.</li> <li>• Customers will be given an opportunity to borrow solar products without being demanded to pay cash outright where transfer of ownership would happen after an agreed timeframe with the potential customer</li> </ul>
4	Natural Disaster could affect the adoption of solar energy Kiosk.  Chikwawa and Nsanje are disaster prone districts. The two districts are susceptible to floods and droughts which could affect household incomes.	High	High	<ul style="list-style-type: none"> <li>• The project will be implemented in areas that are not highly susceptible to floods.</li> </ul>
5	Lack of entrepreneurship skill in Operators to manage the kiosk profitably. Kiosk Operators	Medium	High	<ul style="list-style-type: none"> <li>• Operators will be trained and later mentored in business management.</li> </ul>

	to be identified will be given the responsibility to manage a business not out of their choice. Furthermore, very few Malawians have the knowledge and experience of managing a Solar Energy Kiosk			
6	Lack of foreign currency to import solar products as they are manufactured outside the country.	Low	High	<ul style="list-style-type: none"> <li>• The Operators will establish a long-term relationship with reliable suppliers of solar product e.g. Solar Aid.</li> </ul>
7	Scarcity of spare parts for solar products could affect their adoption as most solar products are imported into the country.	High	Medium	<ul style="list-style-type: none"> <li>• The operators will keep more stock in inventory to be used when need arise.</li> <li>• Forming of partnership with a number of solar product suppliers.</li> </ul>

**Table 36: Summary of Risks and Mitigation Measurers**

## 5.4 Suitable organisational structure

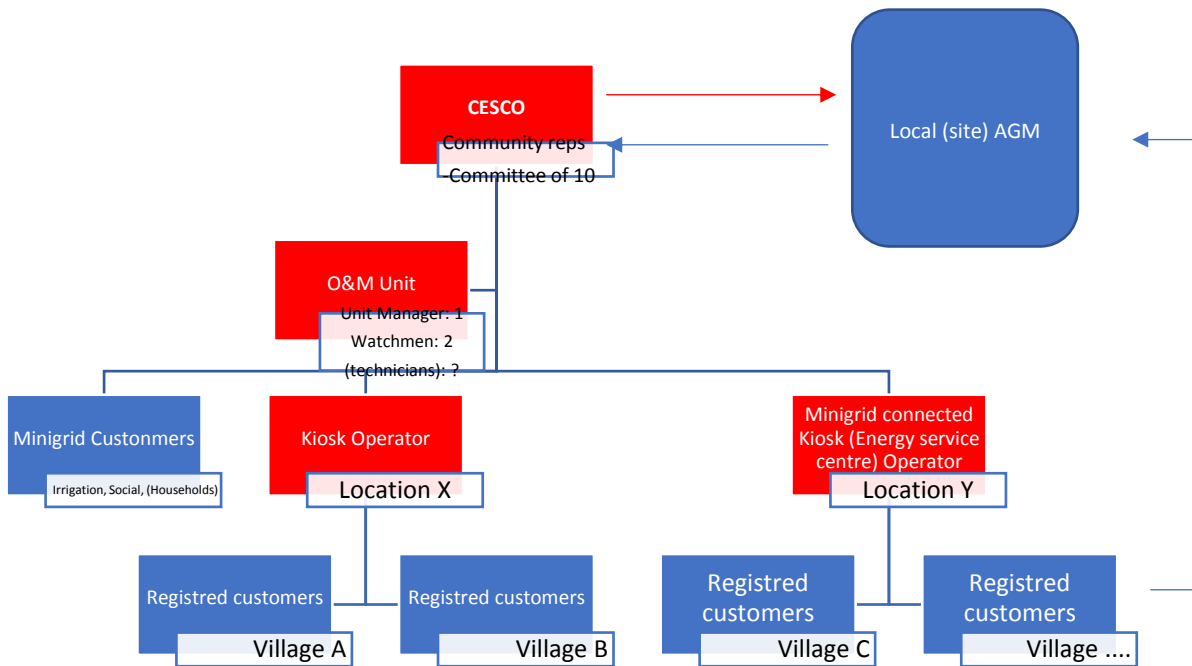
Below is a proposed organisational structure(s) for energy management in the project sites.

### 5.4.1 Institutional setup at community with minigrid

Each minigrid will be managed by a CESCO, a committee elected by the community that will be served by the minigrid. It is this committee that will be the applicants to MERA for registration of the minigrid, and act as registered owners of the facility, on behalf of the community using the facilities.

The committee will recruit an O&M Unit, initially with just a Unit manager and two Guards, and 2 voluntary technical support persons (these can later be recruited as the financial position picks up.).

The CESCO will operate as registered owners of the minigrid, holding it as an Executive Board on behalf of the community. The CESCO will annually call for an AGM of all households being serviced by the particular minigrid, including would be customers.



**Figure 31: Institutional structure for Minigrid and Kiosks/Energy Service Centre**

### 5.4.2 Institutional setup at community with Kiosk only

Some Kiosks (three located in Nsanje) are far away to be meaningfully linked to any minigrid and its management CESCO. Such Kiosks will operate independently, with the community being

served electing their own Kiosk Management Committee that will operate the Kiosk. This will be the one responsible for recruiting an O&M Unit. The Kiosk Committee will be calling an AGM for all households from each village in the catchment that has households registered as accessing services from the Kiosk.

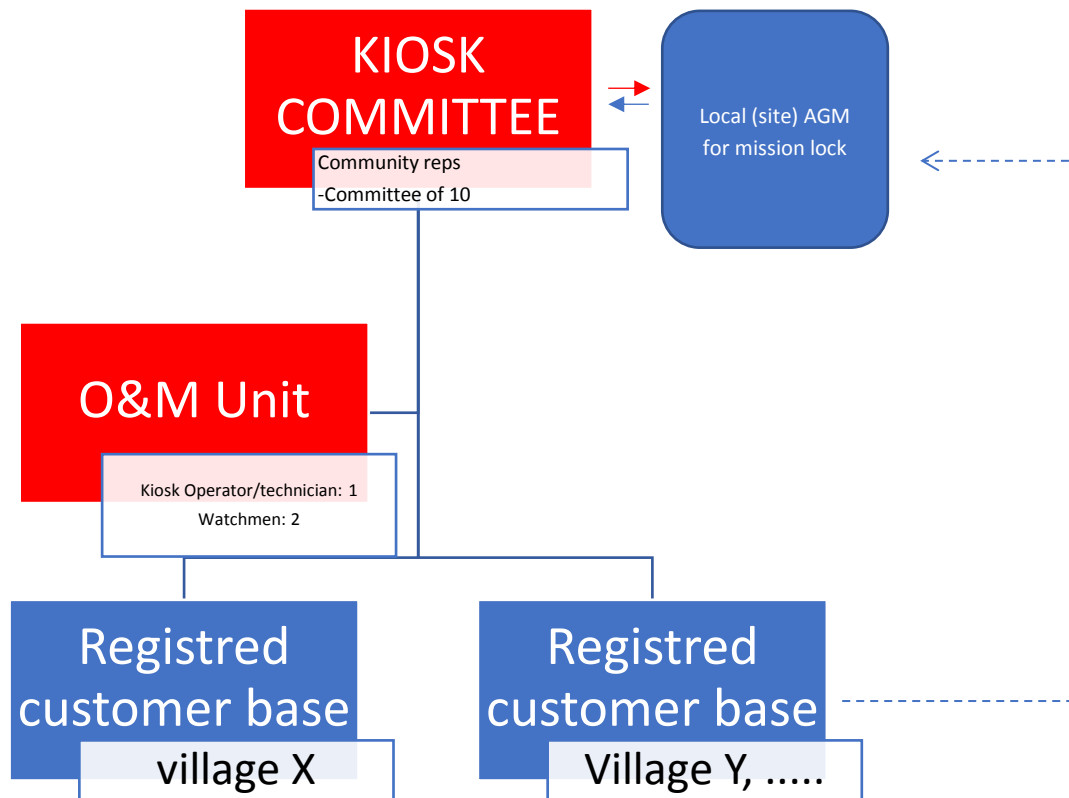


Figure 32: Proposed Organisational Structure for Kiosks that are far from the minigrids

**Operation and Maintenance (O&M):** The O & M will be responsible for ensuring compliance with all technical, regulatory, quality and safety standards in the provision of solar products. The O&M shall comprise of the Unit Manager, Meter Readers and Cashiers.

**Community Energy Service Company (CESCO):** These will comprise of members of the communities who will form a committee of 10 members. The CESCO members will be individuals with the requisite knowledge and experience that would allow them to contribute to the growth of the Solar Energy Kiosk business.

**Kiosk Managers or Operators:** These will be responsible for managing the daily operations of the kiosk business. Kiosk Operators will be people with proven entrepreneurial skills, highly dedicated or committed persons to the kiosk and with ability to work with others or partners.

### BEING CONSIDERED: Community Energy Advisory Group (CEAG)

A Community Energy Advisory Group (CEAG) is under consideration to be formed in each district of Chikwawa and Nsanje. This group is being proposed to have technical advisory role to the communities, the same way the project staff is doing now, with that role being more essential in the post-project era. CEAG is anticipated to enhance the balance of power between communities and the private sector entities that are expected to come into play in time be part of the setup to provide power to the community. The Advisory Group will operate as a “Call on Body” for expert advice, whenever the community intend to upscale the Minigrids or Kiosks be it through re-investment or co-investment with the private sector entities. CEAG will however only be formed after a six to 10 months observation of the operational acumen of the trained CESCOs. The CEAG, if formed, is proposed to pool from the following establishments:

#### Community Interests representation:

- **ADC Chair:** This from the Area Development Committee responsible for the Traditional Authority hosting the Minigrid(s) and Kiosk(s). This will ensure that area level development planning is cognizant of the power and the opportunities it brings to their jurisdiction.
- **Traditional Authority:** This is the TA hosting the Minigrid. In case of minigrid and Kiosk serving more than one TA, the TAs will appoint one to represent them. TAs are the bedrock of primary conflict resolution in the Malawian Society, a role that can aid smooth operations of not only the energy enterprises, but also the enterprises that will result from productive use of the power.

#### Regulatory and Technical oversight Representation

- **MERA:** This will be regional Officer for Southern Region of Malawi. It’s a new Office set up by MERA in its bid to decentralize and be more visible to stakeholders and communities per region. This will ensure that community power in Chikwawa and Nsanje is supplied within the requisite regulatory framework for Malawi.
- **ESCOM representative:** This is the Zonal Officer for ESCOM as per their Zones. S/he is normally a an Electrical Engineer responsible for a District, or their delegate from within the ESCOM ranks. This will bring oversight regarding conformity to national utility company standards, experience in O&M, as well as shape the community power in such manner should there be need in time for connection to National Grid, the community side will be ready for that.

#### Administrative (and political) representation

Two representatives will come from the District Council. The rationale is that such representation can have the necessary institutional and political support to the project power points (Grids and Kiosks). It is envisaged that the Grids and Kiosks will in this way reflect in the District Development planning instruments such as the District Development Plan and its attendant Investment instruments.

- **District Secretariat:** The first is either the District Commissioner OR either The Director of Development (DPD) or Director of Public Works (DPW). Each District Council will appoint their preferred representation.
- **Councilors:** This may be the chairperson of the Council or an appointee from the council whom they feel may best serve the interests of their constituents.

**Figure 33: Consideration for Community Energy Advisory Group**

## 6 Business Model Viability

Though it is without doubt that the minigrids and solar energy kiosks will have significant environmental and social impacts from the initial stages of implementation, their economic impact of the investments will take more than 5 years to be proved mainly because of the huge initial capital outlay that is required, low initial demand and price for solar products. It is however anticipated that the investment will be worthwhile as time goes by and with increase in client base.

### 6.1 Ability to create wealth

Both solar energy kiosks and minigrids will help to improve per capita income of communities through the following ways:

- a) Stimulate the start up of small businesses that depend on power in the area such as hair saloons, barbershops, printing, typing, cold drinks and phone charging businesses.
- b) Refrigeration and value addition of agricultural products that will help to reduce post harvest losses of perishable products such as meat and vegetables.
- c) Provision of employment: Employment will be provided mainly to members of the community whose purchasing power will increase and consequently their standard of living.

### 6.2 Ability to create value

Both the Minigrids and Solar Energy Kiosks once functional will create the following values:

- a) **Health Impact:** Solar products will reduce respiratory diseases associated with the use of charcoal and firewood
- b) **Education:** Lighting from solar energy will allow school children to have more time for studies thereby improve their performance in school. Education is a catalyst of economic development and independence. Use of solar energy will also free up time that a girl child would have spent fetching for firewood for cooking.
- c) **Security:** Lighting from solar energy will help to protect customers from wild animals such as snakes when walking at night, thieves and also loss of property as a result of fire used for lighting in grass thatched houses.

### 6.3 Ability to scale up

The main services of the Solar Energy Kiosk will be charging of lanterns, phones, batteries and provision of printing services. Depending on demand and availability of resources, the Solar Energy Kiosk would be involved in renting and trading of solar products. Additionally, the Energy Kiosk business could be scaled and replicated to more other areas in the district, as

more people in the district have no access to reliable and affordable energy sources. Identification and working with key partners would be critical in scaling up the business.

#### 6.4 Exit strategy viability

In order to ensure sustainability of the project initiatives, a good exit strategy will need to be put in place. The following are some of the proposed exit strategies for project:

##### a) **Community Mobilisation**

This shall involve making communities understand that their responsibility of managing the Solar Energy Kiosk. A proper communication strategy will be put in place from the onset of the project to make communities aware that the management of the project will be in their hands. Community mobilisation will involve use of traditional leaders and regular meetings with members of the communities.

##### b) **Community Empowerment**

This will entail involving members of the community in the implementation of the project activities. It will also involve provision of capacity building through training, mentorship and coaching in business management, financial management, marketing and leadership and governance.

##### c) **Key Stakeholder involvement**

This will involve identifying key stakeholders and garnering their support towards the project objectives. Stakeholder involvement in the planning, implementation and evaluation of the project will be critical in ensuring their support.

##### d) **Pre-project closure activities**

Completing the implementation of key project activities in time will give project management team an opportunity to spend more time on setting up sustainability strategies which shall include ensuring that:

1. The Solar Energy Kiosks and Misnigrads are making adequate profits and that are enough funds in the bank to sustain the business
2. Strong partnerships with key stakeholders have been established.
3. Project closure meetings with key stakeholders are held on time.
4. Communication with communities about the end date of the project.
5. All existing skills gaps are addressed before the project finally closes.



## 7 Appendices

### 7.1 Appendix \_ Nyamvuu Solar Energy Kiosk Financial Model

#### 7.1.1 Statement of Comprehensive Income (Profit and Loss Account)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>REVENUE</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>
Service charges	16,017	17,618	19,380	21,318	23,450	25,795	28,375	31,212	34,333	37,767	41,543	45,698	50,267	55,294	60,824	66,906	73,596	80,956	89,052	97,957
<b>Total revenue</b>	<b>16,017</b>	<b>17,618</b>	<b>19,380</b>	<b>21,318</b>	<b>23,450</b>	<b>25,795</b>	<b>28,375</b>	<b>31,212</b>	<b>34,333</b>	<b>37,767</b>	<b>41,543</b>	<b>45,698</b>	<b>50,267</b>	<b>55,294</b>	<b>60,824</b>	<b>66,906</b>	<b>73,596</b>	<b>80,956</b>	<b>89,052</b>	<b>97,957</b>
<b>OPERATING COSTS</b>																				
Salary	1,590	1,749	1,924	2,116	2,328	2,561	2,817	3,098	3,408	3,749	4,124	4,536	4,990	5,489	6,038	6,642	7,306	8,036	8,840	9,724
Communication	251	276	304	334	368	404	445	489	538	592	651	716	788	867	953	1,049	1,154	1,269	1,396	1,535
Transport	335	368	405	446	490	539	593	652	718	789	868	955	1,051	1,156	1,271	1,398	1,538	1,692	1,861	2,047
Insurance	2,391	2,391	2,391	2,391	2,391	50	25	2,416	167	642	25	783	1,633	2,416	300	250	2,466	177	783	250
Marketing	251	276	304	334	368	404	445	489	538	592	651	716	788	867	953	1,049	1,154	1,269	1,396	1,535
Repairs and maintenance	502	552	608	668	735	809	889	978	1,076	1,184	1,302	1,433	1,576	1,733	1,907	2,097	2,307	2,538	2,792	3,071
Printing and Stationery	167	184	203	223	245	270	296	326	359	395	434	478	525	578	636	699	769	846	931	1,024
<b>TOTAL OPERATING COSTS</b>	<b>5,487</b>	<b>5,797</b>	<b>6,137</b>	<b>6,512</b>	<b>6,924</b>	<b>5,037</b>	<b>5,510</b>	<b>8,450</b>	<b>6,804</b>	<b>7,942</b>	<b>8,056</b>	<b>9,617</b>	<b>11,350</b>	<b>13,105</b>	<b>12,058</b>	<b>13,184</b>	<b>16,693</b>	<b>15,827</b>	<b>17,998</b>	<b>19,186</b>
<b>EBIDT</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>16,526</b>	<b>20,759</b>	<b>22,865</b>	<b>22,762</b>	<b>27,530</b>	<b>29,824</b>	<b>33,488</b>	<b>36,080</b>	<b>38,918</b>	<b>42,189</b>	<b>48,766</b>	<b>53,722</b>	<b>56,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
Depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>EBIT</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>
Interest on loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>EBT</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>

Table 37: State of Comprehensive Income - Nyamvuu Solar Energy Kiosk

## 7.1.2 Statement of Financial Position (Balance Sheet) Nyamvuu Kiosk

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant and Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture and fitting	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Fixed Assets</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>
<b>Current Assets</b>																				
Bank and cash	10,530	22,351	35,594	50,400	65,926	80,685	103,550	126,312	151,842	181,666	207,098	243,179	278,096	320,285	369,051	412,773	464,676	529,806	600,859	679,630
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>10,530</b>	<b>22,351</b>	<b>35,594</b>	<b>50,400</b>	<b>65,926</b>	<b>80,685</b>	<b>103,550</b>	<b>126,312</b>	<b>151,842</b>	<b>181,666</b>	<b>207,098</b>	<b>243,179</b>	<b>278,096</b>	<b>320,285</b>	<b>369,051</b>	<b>412,773</b>	<b>464,676</b>	<b>529,806</b>	<b>600,859</b>	<b>679,630</b>
<b>Total Assets</b>	<b>59,438</b>	<b>67,961</b>	<b>77,905</b>	<b>89,413</b>	<b>102,514</b>	<b>119,649</b>	<b>138,889</b>	<b>158,027</b>	<b>181,683</b>	<b>207,633</b>	<b>236,845</b>	<b>268,649</b>	<b>302,791</b>	<b>340,205</b>	<b>384,195</b>	<b>432,742</b>	<b>484,220</b>	<b>543,924</b>	<b>609,552</b>	<b>682,897</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)
Retained Earnings	(7,231)	(15,754)	(25,698)	(37,205)	(50,307)	(67,442)	(86,682)	(105,820)	(129,475)	(155,425)	(184,637)	(216,442)	(250,584)	(287,998)	(331,988)	(380,534)	(432,012)	(491,716)	(557,344)	(630,689)
<b>Total Equity and Reserves</b>	<b>(59,438)</b>	<b>(67,961)</b>	<b>(77,905)</b>	<b>(89,413)</b>	<b>(102,514)</b>	<b>(119,649)</b>	<b>(138,889)</b>	<b>(158,027)</b>	<b>(181,683)</b>	<b>(207,633)</b>	<b>(236,845)</b>	<b>(268,649)</b>	<b>(302,791)</b>	<b>(340,205)</b>	<b>(384,195)</b>	<b>(432,742)</b>	<b>(484,220)</b>	<b>(543,924)</b>	<b>(609,552)</b>	<b>(682,897)</b>
<b>Liabilities</b>																				
Bank Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(59,438)</b>	<b>(67,961)</b>	<b>(77,905)</b>	<b>(89,413)</b>	<b>(102,514)</b>	<b>(119,649)</b>	<b>(138,889)</b>	<b>(158,027)</b>	<b>(181,683)</b>	<b>(207,633)</b>	<b>(236,845)</b>	<b>(268,649)</b>	<b>(302,791)</b>	<b>(340,205)</b>	<b>(384,195)</b>	<b>(432,742)</b>	<b>(484,220)</b>	<b>(543,924)</b>	<b>(609,552)</b>	<b>(682,897)</b>

Table 38: Statement of Financial Position Nyamvuu Solar Kiosk

### 7.1.3 Statement of Cashflows (Cashflow Statement) Nyamvuu Kiosk

Description	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$																			
Net profit from trading	7,231	8,523	9,944	11,508	13,102	17,134	19,240	19,138	23,655	25,950	29,212	31,805	34,142	37,414	43,990	48,547	51,478	59,704	65,628	73,345
Add back interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>Adjusted trading profit</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>16,526</b>	<b>20,759</b>	<b>22,865</b>	<b>22,762</b>	<b>27,530</b>	<b>29,824</b>	<b>33,488</b>	<b>36,080</b>	<b>38,918</b>	<b>42,189</b>	<b>48,766</b>	<b>53,722</b>	<b>56,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	52,207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(52,207)	-	-	-	(1,000)	(6,000)	-	-	(2,000)	-	(8,055)	-	(4,000)	-	-	(10,000)	(5,000)	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>(6,000)</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(8,055)</b>	<b>-</b>	<b>(4,000)</b>	<b>-</b>	<b>-</b>	<b>(10,000)</b>	<b>(5,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan Principal and Interest Repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Cash Flow from Financing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Net Cash flow	10,530	11,822	13,243	14,806	15,526	14,759	22,865	22,762	25,530	29,824	25,433	36,080	34,918	42,189	48,766	43,722	51,903	65,130	71,053	78,771
Cash brought forward	-	10,530	22,351	35,594	50,400	65,926	80,685	103,550	126,312	151,842	181,666	207,098	243,179	278,096	320,285	369,051	412,773	464,676	529,806	600,859
<b>Cash carried forward</b>	<b>10,530</b>	<b>22,351</b>	<b>35,594</b>	<b>50,400</b>	<b>65,926</b>	<b>80,685</b>	<b>103,550</b>	<b>126,312</b>	<b>151,842</b>	<b>181,666</b>	<b>207,098</b>	<b>243,179</b>	<b>278,096</b>	<b>320,285</b>	<b>369,051</b>	<b>412,773</b>	<b>464,676</b>	<b>529,806</b>	<b>600,859</b>	<b>679,630</b>

Table 39: Statement of Cashflow Nyamvuu Solar Energy Kiosk

#### 7.1.4 Payback Period Nyamvuu Kiosk

PAYBACK PERIOD COMPUTATION						
YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD
1	(52,207)	7,231	(44,976)	1		
2		8,523	(36,454)	1		
3		9,944	(26,509)	1		
4		11,508	(15,002)	1		
5		13,102	(1,900)	1		
6		17,134	15,234		0.89	<b>5.89</b>

**Table 40: Payback Period Nyamvuu Solar Energy Kiosk**

## 7.2 Appendix – Oleole Solar Energy Kiosk Financial Model

### 7.2.1 Statement of Comprehensive Income (Profit and Loss Account)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>REVENUE</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>
Service charges	19,699	21,669	23,835	26,219	28,841	31,725	34,898	38,387	42,226	46,449	51,093	56,203	61,823	68,005	74,806	82,287	90,515	99,567	109,523	120,476
<b>Total revenue</b>	<b>19,699</b>	<b>21,669</b>	<b>23,835</b>	<b>26,219</b>	<b>28,841</b>	<b>31,725</b>	<b>34,898</b>	<b>38,387</b>	<b>42,226</b>	<b>46,449</b>	<b>51,093</b>	<b>56,203</b>	<b>61,823</b>	<b>68,005</b>	<b>74,806</b>	<b>82,287</b>	<b>90,515</b>	<b>99,567</b>	<b>109,523</b>	<b>120,476</b>
<b>OPERATING COSTS</b>																				
Salary	2,259	2,485	2,734	3,007	3,308	3,639	4,003	4,403	4,843	5,328	5,860	6,446	7,091	7,800	8,580	9,438	10,382	11,420	12,562	13,818
Communication	669	736	810	891	980	1,078	1,186	1,305	1,435	1,579	1,736	1,910	2,101	2,311	2,542	2,796	3,076	3,384	3,722	4,094
Transport	837	921	1,013	1,114	1,225	1,348	1,482	1,631	1,794	1,973	2,170	2,388	2,626	2,889	3,178	3,496	3,845	4,230	4,653	5,118
Insurance	2,391	2,391	2,391	2,391	2,391	50	25	2,416	167	642	25	783	1,633	2,416	300	250	2,466	177	783	250
Marketing	502	552	608	668	735	809	889	978	1,076	1,184	1,302	1,433	1,576	1,733	1,907	2,097	2,307	2,538	2,792	3,071
Repairs and maintenance	1,674	1,841	2,025	2,228	2,450	2,695	2,965	3,261	3,588	3,946	4,341	4,775	5,253	5,778	6,356	6,991	7,690	8,459	9,305	10,236
Printing and Stationery	753	828	911	1,002	1,103	1,213	1,334	1,468	1,614	1,776	1,953	2,149	2,364	2,600	2,860	3,146	3,461	3,807	4,187	4,606
<b>TOTAL OPERATING COSTS</b>	<b>9,085</b>	<b>9,755</b>	<b>10,491</b>	<b>11,301</b>	<b>12,192</b>	<b>10,832</b>	<b>11,885</b>	<b>15,462</b>	<b>14,517</b>	<b>16,427</b>	<b>17,389</b>	<b>19,884</b>	<b>22,643</b>	<b>25,527</b>	<b>25,723</b>	<b>28,215</b>	<b>33,227</b>	<b>34,014</b>	<b>38,005</b>	<b>41,193</b>
<b>EBIDT</b>	<b>10,613</b>	<b>11,914</b>	<b>13,344</b>	<b>14,918</b>	<b>16,649</b>	<b>20,893</b>	<b>23,013</b>	<b>22,925</b>	<b>27,709</b>	<b>30,022</b>	<b>33,705</b>	<b>36,319</b>	<b>39,180</b>	<b>42,478</b>	<b>49,083</b>	<b>54,072</b>	<b>57,288</b>	<b>65,553</b>	<b>71,519</b>	<b>79,282</b>
Depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>EBIT</b>	<b>7,315</b>	<b>8,615</b>	<b>10,045</b>	<b>11,619</b>	<b>13,224</b>	<b>17,269</b>	<b>19,389</b>	<b>19,301</b>	<b>23,835</b>	<b>26,147</b>	<b>29,429</b>	<b>32,043</b>	<b>34,405</b>	<b>37,702</b>	<b>44,308</b>	<b>48,896</b>	<b>51,862</b>	<b>60,127</b>	<b>66,093</b>	<b>73,857</b>
Interest on loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>EBT</b>	<b>7,315</b>	<b>8,615</b>	<b>10,045</b>	<b>11,619</b>	<b>13,224</b>	<b>17,269</b>	<b>19,389</b>	<b>19,301</b>	<b>23,835</b>	<b>26,147</b>	<b>29,429</b>	<b>32,043</b>	<b>34,405</b>	<b>37,702</b>	<b>44,308</b>	<b>48,896</b>	<b>51,862</b>	<b>60,127</b>	<b>66,093</b>	<b>73,857</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>7,315</b>	<b>8,615</b>	<b>10,045</b>	<b>11,619</b>	<b>13,224</b>	<b>17,269</b>	<b>19,389</b>	<b>19,301</b>	<b>23,835</b>	<b>26,147</b>	<b>29,429</b>	<b>32,043</b>	<b>34,405</b>	<b>37,702</b>	<b>44,308</b>	<b>48,896</b>	<b>51,862</b>	<b>60,127</b>	<b>66,093</b>	<b>73,857</b>

**Table 41: Statement of Comprehensive Income Oleole Solar Energy Kiosk**

7.2.2 Statement of Financial Position Oleole Solar Energy Kiosk (Balance Sheet)

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant and Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture and fitting	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Fixed Assets</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>
<b>Current Assets</b>																				
Bank and cash	10,613	22,527	35,871	50,789	66,437	81,331	104,343	127,269	152,978	182,999	208,649	244,968	280,148	322,626	371,710	415,781	468,069	533,622	605,140	684,423
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>10,613</b>	<b>22,527</b>	<b>35,871</b>	<b>50,789</b>	<b>66,437</b>	<b>81,331</b>	<b>104,343</b>	<b>127,269</b>	<b>152,978</b>	<b>182,999</b>	<b>208,649</b>	<b>244,968</b>	<b>280,148</b>	<b>322,626</b>	<b>371,710</b>	<b>415,781</b>	<b>468,069</b>	<b>533,622</b>	<b>605,140</b>	<b>684,423</b>
<b>Total Assets</b>	<b>59,522</b>	<b>68,137</b>	<b>78,182</b>	<b>89,801</b>	<b>103,025</b>	<b>120,294</b>	<b>139,683</b>	<b>158,984</b>	<b>182,819</b>	<b>208,966</b>	<b>238,395</b>	<b>270,439</b>	<b>304,844</b>	<b>342,546</b>	<b>386,854</b>	<b>435,750</b>	<b>487,612</b>	<b>547,739</b>	<b>613,833</b>	<b>687,690</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)
Retained Earnings	(7,315)	(15,929)	(25,975)	(37,594)	(50,818)	(68,087)	(87,476)	(106,777)	(130,612)	(156,759)	(186,188)	(218,232)	(252,636)	(290,339)	(334,647)	(383,543)	(435,405)	(495,532)	(561,625)	(635,482)
<b>Total Equity and Reserves</b>	<b>(59,522)</b>	<b>(68,137)</b>	<b>(78,182)</b>	<b>(89,801)</b>	<b>(103,025)</b>	<b>(120,294)</b>	<b>(139,683)</b>	<b>(158,984)</b>	<b>(182,819)</b>	<b>(208,966)</b>	<b>(238,395)</b>	<b>(270,439)</b>	<b>(304,844)</b>	<b>(342,546)</b>	<b>(386,854)</b>	<b>(435,750)</b>	<b>(487,612)</b>	<b>(547,739)</b>	<b>(613,833)</b>	<b>(687,690)</b>
<b>Liabilities</b>																				
Bank Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(59,522)</b>	<b>(68,137)</b>	<b>(78,182)</b>	<b>(89,801)</b>	<b>(103,025)</b>	<b>(120,294)</b>	<b>(139,683)</b>	<b>(158,984)</b>	<b>(182,819)</b>	<b>(208,966)</b>	<b>(238,395)</b>	<b>(270,439)</b>	<b>(304,844)</b>	<b>(342,546)</b>	<b>(386,854)</b>	<b>(435,750)</b>	<b>(487,612)</b>	<b>(547,739)</b>	<b>(613,833)</b>	<b>(687,690)</b>

Table 42: Statement of Financial Position Oleole Solar Energy Kiosk

### 7.2.3 Statement of Cashflows Oleole Solar Energy Kiosk ( Cashflow Statement)

Description	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$																			
Net profit from trading	7,315	8,615	10,045	11,619	13,224	17,269	19,389	19,301	23,835	26,147	29,429	32,043	34,405	37,702	44,308	48,896	51,862	60,127	66,093	73,857
Add back interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>Adjusted trading profit</b>	<b>10,613</b>	<b>11,914</b>	<b>13,344</b>	<b>14,918</b>	<b>16,649</b>	<b>20,893</b>	<b>23,013</b>	<b>22,925</b>	<b>27,709</b>	<b>30,022</b>	<b>33,705</b>	<b>36,319</b>	<b>39,180</b>	<b>42,478</b>	<b>49,083</b>	<b>54,072</b>	<b>57,288</b>	<b>65,553</b>	<b>71,519</b>	<b>79,282</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	52,207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(52,207)	-	-	-	(1,000)	(6,000)	-	-	(2,000)	-	(8,055)	-	(4,000)	-	-	(10,000)	(5,000)	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>(6,000)</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(8,055)</b>	<b>-</b>	<b>(4,000)</b>	<b>-</b>	<b>-</b>	<b>(10,000)</b>	<b>(5,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Principal and Interest Repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Cash Flow from Financing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Net Cash flow	10,613	11,914	13,344	14,918	15,649	14,893	23,013	22,925	25,709	30,022	25,650	36,319	35,180	42,478	49,083	44,072	52,288	65,553	71,519	79,282
Cash brought forward	-	10,613	22,527	35,871	50,789	66,437	81,331	104,343	127,269	152,978	182,999	208,649	244,968	280,148	322,626	371,710	415,781	468,069	533,622	605,140
<b>Cash carried forward</b>	<b>10,613</b>	<b>22,527</b>	<b>35,871</b>	<b>50,789</b>	<b>66,437</b>	<b>81,331</b>	<b>104,343</b>	<b>127,269</b>	<b>152,978</b>	<b>182,999</b>	<b>208,649</b>	<b>244,968</b>	<b>280,148</b>	<b>322,626</b>	<b>371,710</b>	<b>415,781</b>	<b>468,069</b>	<b>533,622</b>	<b>605,140</b>	<b>684,423</b>

**Table 43: Statement of Cashflow Oleole Solar Energy Kiosk**

## 7.2.4 PAY Back Period

PAYBACK PERIOD COMPUTATION						
YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD
1	(52,207)	7,315	(44,893)	1		
2		8,615	(36,278)	1		
3		10,045	(26,232)	1		
4		11,619	(14,614)	1		
5		13,224	(1,389)	1		
6		17,269	15,880		0.92	5.92

**Table 44: Pay Back Period Oleole Solar Energy Kiosk**

## 7.3 Appendix – Mwalija Solar Energy Kiosk Financial Model

### 7.3.1 Statement of Comprehensive Income (Profit and Loss Account) –Mwalija Kiosk

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>REVENUE</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>
Service charges	16,017	17,618	19,380	21,318	23,450	25,795	28,375	31,212	34,333	37,767	41,543	45,698	50,267	55,294	60,824	66,906	73,596	80,956	89,052	97,957
<b>Total revenue</b>	<b>16,017</b>	<b>17,618</b>	<b>19,380</b>	<b>21,318</b>	<b>23,450</b>	<b>25,795</b>	<b>28,375</b>	<b>31,212</b>	<b>34,333</b>	<b>37,767</b>	<b>41,543</b>	<b>45,698</b>	<b>50,267</b>	<b>55,294</b>	<b>60,824</b>	<b>66,906</b>	<b>73,596</b>	<b>80,956</b>	<b>89,052</b>	<b>97,957</b>
<b>OPERATING COSTS</b>																				
Salary	1,590	1,749	1,924	2,116	2,328	2,561	2,817	3,098	3,408	3,749	4,124	4,536	4,990	5,489	6,038	6,642	7,306	8,036	8,840	9,724
Communication	251	276	304	334	368	404	445	489	538	592	651	716	788	867	953	1,049	1,154	1,269	1,396	1,535
Transport	335	368	405	446	490	539	593	652	718	789	868	955	1,051	1,156	1,271	1,398	1,538	1,692	1,861	2,047
Insurance	2,391	2,391	2,391	2,391	2,391	50	25	2,416	167	642	25	783	1,633	2,416	300	250	2,466	177	783	250
Marketing	251	276	304	334	368	404	445	489	538	592	651	716	788	867	953	1,049	1,154	1,269	1,396	1,535
Repairs and maintenance	502	552	608	668	735	809	889	978	1,076	1,184	1,302	1,433	1,576	1,733	1,907	2,097	2,307	2,538	2,792	3,071
Printing and Stationery	167	184	203	223	245	270	296	326	359	395	434	478	525	578	636	699	769	846	931	1,024
<b>TOTAL OPERATING COSTS</b>	<b>5,487</b>	<b>5,797</b>	<b>6,137</b>	<b>6,512</b>	<b>6,924</b>	<b>5,037</b>	<b>5,510</b>	<b>8,450</b>	<b>6,804</b>	<b>7,942</b>	<b>8,056</b>	<b>9,617</b>	<b>11,350</b>	<b>13,105</b>	<b>12,058</b>	<b>13,184</b>	<b>16,693</b>	<b>15,827</b>	<b>17,998</b>	<b>19,186</b>
<b>EBIDT</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>16,526</b>	<b>20,759</b>	<b>22,865</b>	<b>22,762</b>	<b>27,530</b>	<b>29,824</b>	<b>33,488</b>	<b>36,080</b>	<b>38,918</b>	<b>42,189</b>	<b>48,766</b>	<b>53,722</b>	<b>56,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
Depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>EBIT</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>
Interest on loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>EBT</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>

Table 45: Statement of Comprehensive Income Mwalija Kiosk

### 7.3.2 Statement of Financial Position (Balance Sheet) –Mwalija Kiosk

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant and Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture and fitting	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Fixed Assets</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>
<b>Current Assets</b>																				
Bank and cash	10,530	22,351	35,594	50,400	65,926	80,685	103,550	126,312	151,842	181,666	207,098	243,179	278,096	320,285	369,051	412,773	464,676	529,806	600,859	679,630
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>10,530</b>	<b>22,351</b>	<b>35,594</b>	<b>50,400</b>	<b>65,926</b>	<b>80,685</b>	<b>103,550</b>	<b>126,312</b>	<b>151,842</b>	<b>181,666</b>	<b>207,098</b>	<b>243,179</b>	<b>278,096</b>	<b>320,285</b>	<b>369,051</b>	<b>412,773</b>	<b>464,676</b>	<b>529,806</b>	<b>600,859</b>	<b>679,630</b>
<b>Total Assets</b>	<b>59,438</b>	<b>67,961</b>	<b>77,905</b>	<b>89,413</b>	<b>102,514</b>	<b>119,649</b>	<b>138,889</b>	<b>158,027</b>	<b>181,683</b>	<b>207,633</b>	<b>236,845</b>	<b>268,649</b>	<b>302,791</b>	<b>340,205</b>	<b>384,195</b>	<b>432,742</b>	<b>484,220</b>	<b>543,924</b>	<b>609,552</b>	<b>682,897</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)
Retained Earnings	(7,231)	(15,754)	(25,698)	(37,205)	(50,307)	(67,442)	(86,682)	(105,820)	(129,475)	(155,425)	(184,637)	(216,442)	(250,584)	(287,998)	(331,988)	(380,534)	(432,012)	(491,716)	(557,344)	(630,689)
<b>Total Equity and Reserves</b>	<b>(59,438)</b>	<b>(67,961)</b>	<b>(77,905)</b>	<b>(89,413)</b>	<b>(102,514)</b>	<b>(119,649)</b>	<b>(138,889)</b>	<b>(158,027)</b>	<b>(181,683)</b>	<b>(207,633)</b>	<b>(236,845)</b>	<b>(268,649)</b>	<b>(302,791)</b>	<b>(340,205)</b>	<b>(384,195)</b>	<b>(432,742)</b>	<b>(484,220)</b>	<b>(543,924)</b>	<b>(609,552)</b>	<b>(682,897)</b>
<b>Liabilities</b>																				
Bank Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(59,438)</b>	<b>(67,961)</b>	<b>(77,905)</b>	<b>(89,413)</b>	<b>(102,514)</b>	<b>(119,649)</b>	<b>(138,889)</b>	<b>(158,027)</b>	<b>(181,683)</b>	<b>(207,633)</b>	<b>(236,845)</b>	<b>(268,649)</b>	<b>(302,791)</b>	<b>(340,205)</b>	<b>(384,195)</b>	<b>(432,742)</b>	<b>(484,220)</b>	<b>(543,924)</b>	<b>(609,552)</b>	<b>(682,897)</b>

**Table 46: Statement of Financial Position Mwalija Kiosk**

### 7.3.3 Statement of Cashflows Mwalija Kiosk

Description	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$																			
Net profit from trading	7,231	8,523	9,944	11,508	13,102	17,134	19,240	19,138	23,655	25,950	29,212	31,805	34,142	37,414	43,990	48,547	51,478	59,704	65,628	73,345
Add back interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>Adjusted trading profit</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>16,526</b>	<b>20,759</b>	<b>22,865</b>	<b>22,762</b>	<b>27,530</b>	<b>29,824</b>	<b>33,488</b>	<b>36,080</b>	<b>38,918</b>	<b>42,189</b>	<b>48,766</b>	<b>53,722</b>	<b>56,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	52,207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(52,207)	-	-	(1,000)	(6,000)	-	-	(2,000)	-	(8,055)	-	(4,000)	-	(10,000)	(5,000)	-	-	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>(6,000)</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(8,055)</b>	<b>-</b>	<b>(4,000)</b>	<b>-</b>	<b>(10,000)</b>	<b>(5,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Principal and Interest Repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Cash Flow from Financing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Net Cash flow</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>15,526</b>	<b>14,759</b>	<b>22,865</b>	<b>22,762</b>	<b>25,530</b>	<b>29,824</b>	<b>25,433</b>	<b>36,080</b>	<b>34,918</b>	<b>42,189</b>	<b>48,766</b>	<b>43,722</b>	<b>51,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
Cash brought forward	-	10,530	22,351	35,594	50,400	65,926	80,685	103,550	126,312	151,842	181,666	207,098	243,179	278,096	320,285	369,051	412,773	464,676	529,806	600,859
<b>Cash carried forward</b>	<b>10,530</b>	<b>22,351</b>	<b>35,594</b>	<b>50,400</b>	<b>65,926</b>	<b>80,685</b>	<b>103,550</b>	<b>126,312</b>	<b>151,842</b>	<b>181,666</b>	<b>207,098</b>	<b>243,179</b>	<b>278,096</b>	<b>320,285</b>	<b>369,051</b>	<b>412,773</b>	<b>464,676</b>	<b>529,806</b>	<b>600,859</b>	<b>679,630</b>

**Table 47: Statement of Cashflows**

### 7.3.4 Payback Period –Mwalija Kiosk

YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD
1	(52,207)	7,231	(44,976)	1		
2		8,523	(36,454)	1		
3		9,944	(26,509)	1		
4		11,508	(15,002)	1		
5		13,102	(1,900)	1		
6		17,134	15,234		0.89	<b>5.89</b>

**Table 48: Payback Period Mwalija Kiosk**

## 7.4 Appendix – Mmelo Solar Energy Kiosk Financial Model

### 7.4.1 Statement of Comprehensive Income – Mmelo Kiosk

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
<b>REVENUE</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>	<b>US\$</b>
Service charges	16,017	17,618	19,380	21,318	23,450	25,795	28,375	31,212	34,333	37,767	41,543	45,698	50,267	55,294	60,824	66,906	73,596	80,956	89,052	97,957
<b>Total revenue</b>	<b>16,017</b>	<b>17,618</b>	<b>19,380</b>	<b>21,318</b>	<b>23,450</b>	<b>25,795</b>	<b>28,375</b>	<b>31,212</b>	<b>34,333</b>	<b>37,767</b>	<b>41,543</b>	<b>45,698</b>	<b>50,267</b>	<b>55,294</b>	<b>60,824</b>	<b>66,906</b>	<b>73,596</b>	<b>80,956</b>	<b>89,052</b>	<b>97,957</b>
<b>OPERATING COSTS</b>																				
Salary	1,590	1,749	1,924	2,116	2,328	2,561	2,817	3,098	3,408	3,749	4,124	4,536	4,990	5,489	6,038	6,642	7,306	8,036	8,840	9,724
Communication	251	276	304	334	368	404	445	489	538	592	651	716	788	867	953	1,049	1,154	1,269	1,396	1,535
Transport	335	368	405	446	490	539	593	652	718	789	868	955	1,051	1,156	1,271	1,398	1,538	1,692	1,861	2,047
Insurance	2,391	2,391	2,391	2,391	2,391	50	25	2,416	167	642	25	783	1,633	2,416	300	250	2,466	177	783	250
Marketing	251	276	304	334	368	404	445	489	538	592	651	716	788	867	953	1,049	1,154	1,269	1,396	1,535
Repairs and maintenance	502	552	608	668	735	809	889	978	1,076	1,184	1,302	1,433	1,576	1,733	1,907	2,097	2,307	2,538	2,792	3,071
Printing and Stationery	167	184	203	223	245	270	296	326	359	395	434	478	525	578	636	699	769	846	931	1,024
<b>TOTAL OPERATING COSTS</b>	<b>5,487</b>	<b>5,797</b>	<b>6,137</b>	<b>6,512</b>	<b>6,924</b>	<b>5,037</b>	<b>5,510</b>	<b>8,450</b>	<b>6,804</b>	<b>7,942</b>	<b>8,056</b>	<b>9,617</b>	<b>11,350</b>	<b>13,105</b>	<b>12,058</b>	<b>13,184</b>	<b>16,693</b>	<b>15,827</b>	<b>17,998</b>	<b>19,186</b>
<b>EBIDT</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>16,526</b>	<b>20,759</b>	<b>22,865</b>	<b>22,762</b>	<b>27,530</b>	<b>29,824</b>	<b>33,488</b>	<b>36,080</b>	<b>38,918</b>	<b>42,189</b>	<b>48,766</b>	<b>53,722</b>	<b>56,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
Depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>EBIT</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>
Interest on loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>EBT</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>7,231</b>	<b>8,523</b>	<b>9,944</b>	<b>11,508</b>	<b>13,102</b>	<b>17,134</b>	<b>19,240</b>	<b>19,138</b>	<b>23,655</b>	<b>25,950</b>	<b>29,212</b>	<b>31,805</b>	<b>34,142</b>	<b>37,414</b>	<b>43,990</b>	<b>48,547</b>	<b>51,478</b>	<b>59,704</b>	<b>65,628</b>	<b>73,345</b>

**Table 49: Statement of Comprehensive Income - Mmelo Kiosk**

## 7.4.2 Statement of Financial Position – Mmelo Kiosk

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	5,336	5,227	5,118	5,009	4,900	4,791	4,682	4,573	4,464	4,356	4,247	4,138	4,029	3,920	3,811	3,702	3,593	3,484	3,376	3,267
Plant and Equipment	43,161	40,100	37,039	33,978	30,917	33,656	30,395	27,134	23,872	20,611	24,950	21,289	17,628	13,967	10,306	16,245	12,183	8,122	4,061	-
Computers	374	249	125	-	750	500	250	-	1,500	1,000	500	-	3,000	2,000	1,000	-	3,750	2,500	1,250	-
Furniture and fitting	38	34	29	25	21	17	13	8	4	-	50	44	39	33	28	22	17	11	6	-
<b>Total Fixed Assets</b>	<b>48,909</b>	<b>45,610</b>	<b>42,311</b>	<b>39,012</b>	<b>36,588</b>	<b>38,964</b>	<b>35,340</b>	<b>31,715</b>	<b>29,841</b>	<b>25,967</b>	<b>29,746</b>	<b>25,471</b>	<b>24,695</b>	<b>19,920</b>	<b>15,144</b>	<b>19,969</b>	<b>19,543</b>	<b>14,118</b>	<b>8,692</b>	<b>3,267</b>
<b>Current Assets</b>																				
Bank and cash	10,530	22,351	35,594	50,400	65,926	80,685	103,550	126,312	151,842	181,666	207,098	243,179	278,096	320,285	369,051	412,773	464,676	529,806	600,859	679,630
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>10,530</b>	<b>22,351</b>	<b>35,594</b>	<b>50,400</b>	<b>65,926</b>	<b>80,685</b>	<b>103,550</b>	<b>126,312</b>	<b>151,842</b>	<b>181,666</b>	<b>207,098</b>	<b>243,179</b>	<b>278,096</b>	<b>320,285</b>	<b>369,051</b>	<b>412,773</b>	<b>464,676</b>	<b>529,806</b>	<b>600,859</b>	<b>679,630</b>
<b>Total Assets</b>	<b>59,438</b>	<b>67,961</b>	<b>77,905</b>	<b>89,413</b>	<b>102,514</b>	<b>119,649</b>	<b>138,889</b>	<b>158,027</b>	<b>181,683</b>	<b>207,633</b>	<b>236,845</b>	<b>268,649</b>	<b>302,791</b>	<b>340,205</b>	<b>384,195</b>	<b>432,742</b>	<b>484,220</b>	<b>543,924</b>	<b>609,552</b>	<b>682,897</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)	(52,207)
Retained Earnings	(7,231)	(15,754)	(25,698)	(37,205)	(50,307)	(67,442)	(86,682)	(105,820)	(129,475)	(155,425)	(184,637)	(216,442)	(250,584)	(287,998)	(331,988)	(380,534)	(432,012)	(491,716)	(557,344)	(630,689)
<b>Total Equity and Reserves</b>	<b>(59,438)</b>	<b>(67,961)</b>	<b>(77,905)</b>	<b>(89,413)</b>	<b>(102,514)</b>	<b>(119,649)</b>	<b>(138,889)</b>	<b>(158,027)</b>	<b>(181,683)</b>	<b>(207,633)</b>	<b>(236,845)</b>	<b>(268,649)</b>	<b>(302,791)</b>	<b>(340,205)</b>	<b>(384,195)</b>	<b>(432,742)</b>	<b>(484,220)</b>	<b>(543,924)</b>	<b>(609,552)</b>	<b>(682,897)</b>
<b>Liabilities</b>																				
Bank Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(59,438)</b>	<b>(67,961)</b>	<b>(77,905)</b>	<b>(89,413)</b>	<b>(102,514)</b>	<b>(119,649)</b>	<b>(138,889)</b>	<b>(158,027)</b>	<b>(181,683)</b>	<b>(207,633)</b>	<b>(236,845)</b>	<b>(268,649)</b>	<b>(302,791)</b>	<b>(340,205)</b>	<b>(384,195)</b>	<b>(432,742)</b>	<b>(484,220)</b>	<b>(543,924)</b>	<b>(609,552)</b>	<b>(682,897)</b>

Table 50: Statement of Financial Position - Mmelo Kiosk

### 7.4.3 Statement of Cashflow – Mmelo Kiosk

Description	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$																			
Net profit from trading	7,231	8,523	9,944	11,508	13,102	17,134	19,240	19,138	23,655	25,950	29,212	31,805	34,142	37,414	43,990	48,547	51,478	59,704	65,628	73,345
Add back interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	3,299	3,299	3,299	3,299	3,424	3,624	3,624	3,624	3,874	3,874	4,276	4,276	4,776	4,776	4,776	5,176	5,426	5,426	5,426	5,426
<b>Adjusted trading profit</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>16,526</b>	<b>20,759</b>	<b>22,865</b>	<b>22,762</b>	<b>27,530</b>	<b>29,824</b>	<b>33,488</b>	<b>36,080</b>	<b>38,918</b>	<b>42,189</b>	<b>48,766</b>	<b>53,722</b>	<b>56,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	52,207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(52,207)	-	-	(1,000)	(6,000)	-	-	(2,000)	-	(8,055)	-	(4,000)	-	(10,000)	(5,000)	-	-	-	-	-
<b>Net Cash Flow from Investing Activities</b>					<b>(1,000)</b>	<b>(6,000)</b>			<b>(2,000)</b>		<b>(8,055)</b>		<b>(4,000)</b>		<b>(10,000)</b>	<b>(5,000)</b>				
<b>Cash Flow from Financing Activities</b>																				
Bank loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Principal and Interest Repayment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Cash Flow from Financing Activities</b>																				
<b>Net Cash flow</b>	<b>10,530</b>	<b>11,822</b>	<b>13,243</b>	<b>14,806</b>	<b>15,526</b>	<b>14,759</b>	<b>22,865</b>	<b>22,762</b>	<b>25,530</b>	<b>29,824</b>	<b>25,433</b>	<b>36,080</b>	<b>34,918</b>	<b>42,189</b>	<b>48,766</b>	<b>43,722</b>	<b>51,903</b>	<b>65,130</b>	<b>71,053</b>	<b>78,771</b>
Cash brought forward	-	10,530	22,351	35,594	50,400	65,926	80,685	103,550	126,312	151,842	181,666	207,098	243,179	278,096	320,285	369,051	412,773	464,676	529,806	600,859
<b>Cash carried forward</b>	<b>10,530</b>	<b>22,351</b>	<b>35,594</b>	<b>50,400</b>	<b>65,926</b>	<b>80,685</b>	<b>103,550</b>	<b>126,312</b>	<b>151,842</b>	<b>181,666</b>	<b>207,098</b>	<b>243,179</b>	<b>278,096</b>	<b>320,285</b>	<b>369,051</b>	<b>412,773</b>	<b>464,676</b>	<b>529,806</b>	<b>600,859</b>	<b>679,630</b>

Table 51: Statement of Cash flow - Mmelo Kiosk

#### 7.4.4 Payback Period – Mmelo Kiosk

YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD
1	(52,207)	7,231	(44,976)	1		
2		8,523	(36,454)	1		
3		9,944	(26,509)	1		
4		11,508	(15,002)	1		
5		13,102	(1,900)	1		
6		17,134	15,234		0.89	5.89

**Table 52: Payback Period - Mmelo Kiosk**

## 7.5 Appendix – Nyamvuu Minigrid Financial Model

### 7.5.1 Statement of Comprehensive Income or Profit and Loss Account – Nyamvuu Minigrid

REVENUE	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Energy Revenue (tariffs)	US\$ 49,120	US\$ 54,032	US\$ 59,435	US\$ 65,379	US\$ 71,917	US\$ 79,108	US\$ 87,019	US\$ 95,721	US\$ 105,293	US\$ 115,823	US\$ 127,405	US\$ 140,145	US\$ 154,160	US\$ 169,576	US\$ 186,533	US\$ 205,187	US\$ 225,705	US\$ 248,276	US\$ 273,103	US\$ 300,414
<b>Total revenue</b>	<b>49,120</b>	<b>54,032</b>	<b>59,435</b>	<b>65,379</b>	<b>71,917</b>	<b>79,108</b>	<b>87,019</b>	<b>95,721</b>	<b>105,293</b>	<b>115,823</b>	<b>127,405</b>	<b>140,145</b>	<b>154,160</b>	<b>169,576</b>	<b>186,533</b>	<b>205,187</b>	<b>225,705</b>	<b>248,276</b>	<b>273,103</b>	<b>300,414</b>
<b>OPERATING COSTS</b>																				
Salary	921	994	1,074	1,160	1,252	2,336	2,523	2,725	2,943	3,178	3,433	3,707	4,004	4,324	4,670	5,044	5,447	5,883	6,354	6,862
Communication	251	271	293	316	342	369	398	430	465	502	542	585	632	683	737	796	860	929	1,003	1,083
Transport	335	362	390	422	455	492	531	574	620	669	723	780	843	910	983	1,062	1,147	1,238	1,338	1,445
Insurance	2,796	2,796	2,796	2,796	2,796	-	-	2,796	80	321	-	401	2,395	2,796	-	-	2,796	80	401	-
Repairs and maintenance	2,796	3,020	3,261	3,522	3,804	4,108	4,437	4,792	5,175	5,589	6,036	6,519	7,041	7,604	8,213	8,870	9,579	10,345	11,173	12,067
Printing and Stationery	167	181	195	211	228	246	266	287	310	335	361	390	421	455	492	531	573	619	669	722
<b>TOTAL OPERATING COSTS</b>	<b>7,266</b>	<b>7,623</b>	<b>8,009</b>	<b>8,427</b>	<b>8,877</b>	<b>7,551</b>	<b>8,155</b>	<b>11,604</b>	<b>9,592</b>	<b>10,594</b>	<b>11,095</b>	<b>12,384</b>	<b>15,336</b>	<b>16,773</b>	<b>15,095</b>	<b>16,302</b>	<b>20,402</b>	<b>19,095</b>	<b>20,937</b>	<b>22,179</b>
<b>EBIDT</b>	<b>41,854</b>	<b>46,409</b>	<b>51,426</b>	<b>56,952</b>	<b>63,040</b>	<b>71,557</b>	<b>78,864</b>	<b>84,117</b>	<b>95,701</b>	<b>105,229</b>	<b>116,310</b>	<b>127,762</b>	<b>138,824</b>	<b>152,803</b>	<b>171,439</b>	<b>188,884</b>	<b>205,303</b>	<b>229,181</b>	<b>252,166</b>	<b>278,235</b>
Depreciation	8,149	8,149	8,149	8,146	8,274	8,274	8,274	8,274	8,524	8,524	8,527	8,527	8,777	8,777	8,777	8,777	9,152	9,152	9,152	9,152
<b>EBIT</b>	<b>33,705</b>	<b>38,260</b>	<b>43,277</b>	<b>48,806</b>	<b>54,765</b>	<b>63,283</b>	<b>70,590</b>	<b>75,843</b>	<b>87,176</b>	<b>96,704</b>	<b>107,783</b>	<b>119,235</b>	<b>130,047</b>	<b>144,027</b>	<b>162,662</b>	<b>180,108</b>	<b>196,151</b>	<b>220,029</b>	<b>243,015</b>	<b>269,083</b>
Interest on loan	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
<b>EBT</b>	<b>33,655</b>	<b>38,212</b>	<b>43,232</b>	<b>48,763</b>	<b>54,725</b>	<b>63,245</b>	<b>70,555</b>	<b>75,811</b>	<b>87,147</b>	<b>96,677</b>	<b>107,759</b>	<b>119,213</b>	<b>130,027</b>	<b>144,010</b>	<b>162,648</b>	<b>180,096</b>	<b>196,142</b>	<b>220,023</b>	<b>243,011</b>	<b>269,082</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>33,655</b>	<b>38,212</b>	<b>43,232</b>	<b>48,763</b>	<b>54,725</b>	<b>63,245</b>	<b>70,555</b>	<b>75,811</b>	<b>87,147</b>	<b>96,677</b>	<b>107,759</b>	<b>119,213</b>	<b>130,027</b>	<b>144,010</b>	<b>162,648</b>	<b>180,096</b>	<b>196,142</b>	<b>220,023</b>	<b>243,011</b>	<b>269,082</b>

**Table 53: Statement of Comprehensive Income Nyamvuu Minigrid**

## 7.5.2 Statement of Financial Position Nyamvuu Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building Plant and Equipment	36,049	35,314	34,578	33,842	33,107	32,371	31,635	30,900	30,164	29,428	28,692	27,957	27,221	26,485	25,750	25,014	24,278	23,542	22,807	22,071
Computer	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	2.9	57	50	44	38	31	25	19	13	6	-
<b>Total Fixed Assets</b>	<b>271,995</b>	<b>263,846</b>	<b>255,697</b>	<b>247,551</b>	<b>240,277</b>	<b>232,002</b>	<b>223,728</b>	<b>215,453</b>	<b>208,929</b>	<b>200,404</b>	<b>191,938</b>	<b>183,411</b>	<b>177,635</b>	<b>168,858</b>	<b>160,082</b>	<b>151,305</b>	<b>146,653</b>	<b>137,502</b>	<b>128,350</b>	<b>119,199</b>
<b>Current Assets</b>																				
Bank and cash	41,936	88,290	139,664	196,566	258,559	330,072	408,894	492,972	586,636	691,830	808,048	935,781	1,071,578	1,224,357	1,395,775	1,584,640	1,785,427	2,014,594	2,266,750	2,544,976
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>41,936</b>	<b>88,290</b>	<b>139,664</b>	<b>196,566</b>	<b>258,559</b>	<b>330,072</b>	<b>408,894</b>	<b>492,972</b>	<b>586,636</b>	<b>691,830</b>	<b>808,048</b>	<b>935,781</b>	<b>1,071,578</b>	<b>1,224,357</b>	<b>1,395,775</b>	<b>1,584,640</b>	<b>1,785,427</b>	<b>2,014,594</b>	<b>2,266,750</b>	<b>2,544,976</b>
<b>Total Assets</b>	<b>313,932</b>	<b>352,137</b>	<b>395,361</b>	<b>444,118</b>	<b>498,836</b>	<b>562,074</b>	<b>632,622</b>	<b>708,425</b>	<b>795,565</b>	<b>892,235</b>	<b>999,986</b>	<b>1,119,192</b>	<b>1,249,213</b>	<b>1,393,215</b>	<b>1,555,856</b>	<b>1,735,945</b>	<b>1,932,081</b>	<b>2,152,096</b>	<b>2,395,100</b>	<b>2,664,175</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant Retained Earnings	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)	(280,144)
<b>Total Equity and Reserves</b>	<b>(313,799)</b>	<b>(352,011)</b>	<b>(395,243)</b>	<b>(444,006)</b>	<b>(498,731)</b>	<b>(561,976)</b>	<b>(632,531)</b>	<b>(708,341)</b>	<b>(795,488)</b>	<b>(892,165)</b>	<b>(999,923)</b>	<b>(1,119,136)</b>	<b>(1,249,164)</b>	<b>(1,393,174)</b>	<b>(1,555,821)</b>	<b>(1,735,917)</b>	<b>(1,932,060)</b>	<b>(2,152,082)</b>	<b>(2,395,093)</b>	<b>(2,664,175)</b>
<b>Liabilities</b>																				
Bank Loan	(132)	(126)	(119)	(112)	(105)	(98)	(91)	(84)	(77)	(70)	(63)	(56)	(49)	(42)	(35)	(28)	(21)	(14)	(7)	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>(132)</b>	<b>(126)</b>	<b>(119)</b>	<b>(112)</b>	<b>(105)</b>	<b>(98)</b>	<b>(91)</b>	<b>(84)</b>	<b>(77)</b>	<b>(70)</b>	<b>(63)</b>	<b>(56)</b>	<b>(49)</b>	<b>(42)</b>	<b>(35)</b>	<b>(28)</b>	<b>(21)</b>	<b>(14)</b>	<b>(7)</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(313,932)</b>	<b>(352,137)</b>	<b>(395,361)</b>	<b>(444,118)</b>	<b>(498,836)</b>	<b>(562,074)</b>	<b>(632,622)</b>	<b>(708,425)</b>	<b>(795,565)</b>	<b>(892,235)</b>	<b>(999,986)</b>	<b>(1,119,192)</b>	<b>(1,249,213)</b>	<b>(1,393,215)</b>	<b>(1,555,856)</b>	<b>(1,735,945)</b>	<b>(1,932,081)</b>	<b>(2,152,096)</b>	<b>(2,395,100)</b>	<b>(2,664,175)</b>

**Table 54: Statement of Financial Position for Nyamvuu Minigrid**

## 7.5.3 Statement of Cashflows\_ Nyamvuu Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Net profit from trading	33,655	38,212	43,232	48,763	54,725	63,245	70,555	75,811	87,147	96,677	107,759	119,213	130,027	144,010	162,648	180,096	196,142	220,023	243,011	269,082
Add back interest	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	8,149	8,149	8,149	8,146	8,274	8,274	8,274	8,274	8,524	8,524	8,527	8,527	8,777	8,777	8,777	8,777	9,152	9,152	9,152	9,152
<b>Adjusted trading profit</b>	<b>41,854</b>	<b>46,409</b>	<b>51,426</b>	<b>56,952</b>	<b>63,040</b>	<b>71,557</b>	<b>78,864</b>	<b>84,117</b>	<b>95,701</b>	<b>105,229</b>	<b>116,310</b>	<b>127,762</b>	<b>138,824</b>	<b>152,803</b>	<b>171,439</b>	<b>188,884</b>	<b>205,303</b>	<b>229,181</b>	<b>252,166</b>	<b>278,235</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	280,144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(280,144)	-	-	-	(1,000)	-	-	-	(2,000)	-	(60)	-	(3,000)	-	-	-	(4,500)	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(60)</b>	<b>-</b>	<b>(3,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(4,500)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan	139	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loan Repayment (Principal plus Interest)	(58)	(55)	(52)	(50)	(47)	(44)	(42)	(39)	(37)	(34)	(32)	(29)	(26)	(24)	(21)	(19)	(16)	(14)	(11)	(8)
<b>Net Cash Flow from Financing Activities</b>	<b>82</b>	<b>(55)</b>	<b>(52)</b>	<b>(50)</b>	<b>(47)</b>	<b>(44)</b>	<b>(42)</b>	<b>(39)</b>	<b>(37)</b>	<b>(34)</b>	<b>(32)</b>	<b>(29)</b>	<b>(26)</b>	<b>(24)</b>	<b>(21)</b>	<b>(19)</b>	<b>(16)</b>	<b>(14)</b>	<b>(11)</b>	<b>(8)</b>
Net Cash flow	41,936	46,354	51,374	56,902	61,993	71,513	78,822	84,078	93,664	105,194	116,218	127,733	135,797	152,779	171,417	188,866	200,787	229,167	252,155	278,226
Cash brought forward	-	41,936	88,290	139,664	196,566	258,559	330,072	408,894	492,972	586,636	691,830	808,048	935,781	1,071,578	1,224,357	1,395,775	1,584,640	1,785,427	2,014,594	2,266,750
<b>Cash carried forward</b>	<b>41,936</b>	<b>88,290</b>	<b>139,664</b>	<b>196,566</b>	<b>258,559</b>	<b>330,072</b>	<b>408,894</b>	<b>492,972</b>	<b>586,636</b>	<b>691,830</b>	<b>808,048</b>	<b>935,781</b>	<b>1,071,578</b>	<b>1,224,357</b>	<b>1,395,775</b>	<b>1,584,640</b>	<b>1,785,427</b>	<b>2,014,594</b>	<b>2,266,750</b>	<b>2,544,976</b>

**Table 55: Statement of Cashflow for Nyamvuu Minigrid**

## 7.5.4 Payback Period

PAYBACK PERIOD COMPUTATION						
YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD IN YEARS
1	(280,144)	33,655	(246,490)	1	-	
2		38,212	(208,278)	1	-	
3		43,232	(165,046)	1	-	
4		48,763	(116,283)	1	-	
5		54,725	(61,558)	1	-	
6		63,245	1,688	0	0.97	
				5.0	1.0	6.00

**Table 56: Payback Period for Nyamvuu Minigrid**

## 7.6 Appendix – Oleole Minigrig Financial Model

### 7.6.1 Statement of Comprehensive Income \_ Oleole Minigrig

REVENUE	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Energy Revenue (tariffs)	56,540	62,194	68,413	75,255	82,780	91,058	100,164	110,180	121,198	133,318	146,650	161,315	177,447	195,191	214,710	236,181	259,799	285,779	314,357	345,793
<b>Total revenue</b>	<b>56,540</b>	<b>62,194</b>	<b>68,413</b>	<b>75,255</b>	<b>82,780</b>	<b>91,058</b>	<b>100,164</b>	<b>110,180</b>	<b>121,198</b>	<b>133,318</b>	<b>146,650</b>	<b>161,315</b>	<b>177,447</b>	<b>195,191</b>	<b>214,710</b>	<b>236,181</b>	<b>259,799</b>	<b>285,779</b>	<b>314,357</b>	<b>345,793</b>
<b>OPERATING COSTS</b>																				
Salary	921	994	1,074	1,160	1,252	2,336	2,523	2,725	2,943	3,178	3,433	3,707	4,004	4,324	4,670	5,044	5,447	5,883	6,354	6,862
Communication	251	271	293	316	342	369	398	430	465	502	542	585	632	683	737	796	860	929	1,003	1,083
Transport	335	362	390	422	455	492	531	574	620	669	723	780	843	910	983	1,062	1,147	1,238	1,338	1,445
Insurance	2,352	2,352	2,352	2,352	2,352	-	-	2,352	62	249	-	311	2,041	2,352	-	-	2,352	62	311	-
Repairs and maintenance	2,352	2,540	2,743	2,962	3,199	3,455	3,732	4,030	4,352	4,701	5,077	5,483	5,921	6,395	6,907	7,459	8,056	8,701	9,397	10,148
Printing and Stationery	167	181	195	211	228	246	266	287	310	335	361	390	421	455	492	531	573	619	669	722
<b>TOTAL OPERATING COSTS</b>	<b>6,377</b>	<b>6,699</b>	<b>7,046</b>	<b>7,422</b>	<b>7,828</b>	<b>6,898</b>	<b>7,450</b>	<b>10,397</b>	<b>8,752</b>	<b>9,633</b>	<b>10,135</b>	<b>11,257</b>	<b>13,863</b>	<b>15,119</b>	<b>13,789</b>	<b>14,892</b>	<b>18,435</b>	<b>17,432</b>	<b>19,070</b>	<b>20,260</b>
<b>EBIDT</b>	<b>50,163</b>	<b>55,495</b>	<b>61,367</b>	<b>67,833</b>	<b>74,952</b>	<b>84,160</b>	<b>92,714</b>	<b>99,783</b>	<b>112,447</b>	<b>123,685</b>	<b>136,515</b>	<b>150,058</b>	<b>163,584</b>	<b>180,072</b>	<b>200,921</b>	<b>221,289</b>	<b>241,365</b>	<b>268,347</b>	<b>295,287</b>	<b>325,533</b>
Depreciation	6,342	6,342	6,342	6,339	6,467	6,467	6,467	6,467	6,717	6,717	6,719	6,719	6,969	6,969	6,969	6,969	7,344	7,344	7,344	7,344
<b>EBIT</b>	<b>43,822</b>	<b>49,153</b>	<b>55,025</b>	<b>61,494</b>	<b>68,485</b>	<b>77,693</b>	<b>86,247</b>	<b>93,316</b>	<b>105,730</b>	<b>116,968</b>	<b>129,795</b>	<b>143,339</b>	<b>156,615</b>	<b>173,103</b>	<b>193,952</b>	<b>214,320</b>	<b>234,020</b>	<b>261,003</b>	<b>287,943</b>	<b>318,188</b>
Interest on loan	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
<b>EBT</b>	<b>43,771</b>	<b>49,106</b>	<b>54,980</b>	<b>61,451</b>	<b>68,445</b>	<b>77,655</b>	<b>86,212</b>	<b>93,283</b>	<b>105,700</b>	<b>116,941</b>	<b>129,771</b>	<b>143,317</b>	<b>156,595</b>	<b>173,086</b>	<b>193,938</b>	<b>214,308</b>	<b>234,011</b>	<b>260,996</b>	<b>287,939</b>	<b>318,187</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>43,771</b>	<b>49,106</b>	<b>54,980</b>	<b>61,451</b>	<b>68,445</b>	<b>77,655</b>	<b>86,212</b>	<b>93,283</b>	<b>105,700</b>	<b>116,941</b>	<b>129,771</b>	<b>143,317</b>	<b>156,595</b>	<b>173,086</b>	<b>193,938</b>	<b>214,308</b>	<b>234,011</b>	<b>260,996</b>	<b>287,939</b>	<b>318,187</b>

**Table 57: Statement of Comprehensive Income for Oleole Minigrig**

## 7.6.2 Statement of Financial Position \_ Oleole Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	82,460	80,777	79,094	77,411	75,729	74,046	72,363	70,680	68,997	67,314	65,631	63,949	62,266	60,583	58,900	57,217	55,534	53,851	52,169	50,486
Plant and Equipment	146,477	141,947	137,417	132,887	128,356	123,826	119,296	114,766	110,236	105,705	101,175	96,645	92,115	87,584	83,054	78,524	73,994	69,463	64,933	60,403
Computer	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	2.9	57	50	44	38	31	25	19	13	6	-
<b>Total Fixed Assets</b>	<b>229,349</b>	<b>223,007</b>	<b>216,665</b>	<b>210,326</b>	<b>204,859</b>	<b>198,392</b>	<b>191,924</b>	<b>185,457</b>	<b>180,740</b>	<b>174,022</b>	<b>167,363</b>	<b>160,644</b>	<b>156,674</b>	<b>149,705</b>	<b>142,736</b>	<b>135,766</b>	<b>132,922</b>	<b>125,577</b>	<b>118,233</b>	<b>110,889</b>
<b>Current Assets</b>																				
Bank and cash	50,245	105,686	167,000	234,783	308,689	392,804	485,477	585,220	695,630	819,281	955,705	1,105,734	1,266,291	1,446,340	1,647,240	1,868,510	2,105,359	2,373,692	2,668,968	2,994,493
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>50,245</b>	<b>105,686</b>	<b>167,000</b>	<b>234,783</b>	<b>308,689</b>	<b>392,804</b>	<b>485,477</b>	<b>585,220</b>	<b>695,630</b>	<b>819,281</b>	<b>955,705</b>	<b>1,105,734</b>	<b>1,266,291</b>	<b>1,446,340</b>	<b>1,647,240</b>	<b>1,868,510</b>	<b>2,105,359</b>	<b>2,373,692</b>	<b>2,668,968</b>	<b>2,994,493</b>
<b>Total Assets</b>	<b>279,594</b>	<b>328,692</b>	<b>383,665</b>	<b>445,109</b>	<b>513,547</b>	<b>591,196</b>	<b>677,401</b>	<b>770,677</b>	<b>876,370</b>	<b>993,304</b>	<b>1,123,068</b>	<b>1,266,377</b>	<b>1,422,966</b>	<b>1,596,045</b>	<b>1,789,975</b>	<b>2,004,276</b>	<b>2,238,280</b>	<b>2,499,270</b>	<b>2,787,201</b>	<b>3,105,381</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)	(235,690)
Retained Earnings	(43,771)	(92,877)	(147,856)	(209,307)	(277,753)	(355,408)	(441,620)	(534,903)	(640,603)	(757,544)	(887,315)	(1,030,631)	(1,187,226)	(1,360,312)	(1,554,250)	(1,768,558)	(2,002,569)	(2,263,565)	(2,551,504)	(2,869,691)
<b>Total Equity and Reserves</b>	<b>(279,461)</b>	<b>(328,567)</b>	<b>(383,547)</b>	<b>(444,998)</b>	<b>(513,443)</b>	<b>(591,098)</b>	<b>(677,310)</b>	<b>(770,594)</b>	<b>(876,293)</b>	<b>(993,234)</b>	<b>(1,123,005)</b>	<b>(1,266,322)</b>	<b>(1,422,917)</b>	<b>(1,596,003)</b>	<b>(1,789,940)</b>	<b>(2,004,249)</b>	<b>(2,238,260)</b>	<b>(2,499,256)</b>	<b>(2,787,194)</b>	<b>(3,105,381)</b>
<b>Liabilities</b>																				
Bank Loan	(132)	(126)	(119)	(112)	(105)	(98)	(91)	(84)	(77)	(70)	(63)	(56)	(49)	(42)	(35)	(28)	(21)	(14)	(7)	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>(132)</b>	<b>(126)</b>	<b>(119)</b>	<b>(112)</b>	<b>(105)</b>	<b>(98)</b>	<b>(91)</b>	<b>(84)</b>	<b>(77)</b>	<b>(70)</b>	<b>(63)</b>	<b>(56)</b>	<b>(49)</b>	<b>(42)</b>	<b>(35)</b>	<b>(28)</b>	<b>(21)</b>	<b>(14)</b>	<b>(7)</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(279,594)</b>	<b>(328,692)</b>	<b>(383,665)</b>	<b>(445,109)</b>	<b>(513,547)</b>	<b>(591,196)</b>	<b>(677,401)</b>	<b>(770,677)</b>	<b>(876,370)</b>	<b>(993,304)</b>	<b>(1,123,068)</b>	<b>(1,266,377)</b>	<b>(1,422,966)</b>	<b>(1,596,045)</b>	<b>(1,789,975)</b>	<b>(2,004,276)</b>	<b>(2,238,280)</b>	<b>(2,499,270)</b>	<b>(2,787,201)</b>	<b>(3,105,381)</b>

**Table 58: Statement of Financial Position for Oleole Minigrid**

### 7.6.3 Statement of Cashflow – Oleole Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Net profit from trading	43,771	49,106	54,980	61,451	68,445	77,655	86,212	93,283	105,700	116,941	129,771	143,317	156,595	173,086	193,938	214,308	234,011	260,996	287,939	318,187
Add back interest	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	6,342	6,342	6,342	6,339	6,467	6,467	6,467	6,467	6,717	6,717	6,719	6,719	6,969	6,969	6,969	6,969	7,344	7,344	7,344	7,344
<b>Adjusted trading profit</b>	<b>50,163</b>	<b>55,495</b>	<b>61,367</b>	<b>67,833</b>	<b>74,952</b>	<b>84,160</b>	<b>92,714</b>	<b>99,783</b>	<b>112,447</b>	<b>123,685</b>	<b>136,515</b>	<b>150,058</b>	<b>163,584</b>	<b>180,072</b>	<b>200,921</b>	<b>221,289</b>	<b>241,365</b>	<b>268,347</b>	<b>295,287</b>	<b>325,533</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	235,690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(235,690)	-	-	-	(1,000)	-	-	-	(2,000)	-	(60)	-	(3,000)	-	-	-	(4,500)	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(60)</b>	<b>-</b>	<b>(3,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(4,500)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan	139	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loan Repayment (Principal plus Interest)	(58)	(55)	(52)	(50)	(47)	(44)	(42)	(39)	(37)	(34)	(32)	(29)	(26)	(24)	(21)	(19)	(16)	(14)	(11)	(8)
<b>Net Cash Flow from Financing Activities</b>	<b>82</b>	<b>(55)</b>	<b>(52)</b>	<b>(50)</b>	<b>(47)</b>	<b>(44)</b>	<b>(42)</b>	<b>(39)</b>	<b>(37)</b>	<b>(34)</b>	<b>(32)</b>	<b>(29)</b>	<b>(26)</b>	<b>(24)</b>	<b>(21)</b>	<b>(19)</b>	<b>(16)</b>	<b>(14)</b>	<b>(11)</b>	<b>(8)</b>
Net Cash flow	50,245	55,440	61,315	67,783	73,905	84,116	92,672	99,744	110,410	123,651	136,423	150,029	160,557	180,048	200,900	221,271	236,848	268,334	295,276	325,524
Cash brought forward	-	50,245	105,686	167,000	234,783	308,689	392,804	485,477	585,220	695,630	819,281	955,705	1,105,734	1,266,291	1,446,340	1,647,240	1,868,510	2,105,359	2,373,692	2,668,968
<b>Cash carried forward</b>	<b>50,245</b>	<b>105,686</b>	<b>167,000</b>	<b>234,783</b>	<b>308,689</b>	<b>392,804</b>	<b>485,477</b>	<b>585,220</b>	<b>695,630</b>	<b>819,281</b>	<b>955,705</b>	<b>1,105,734</b>	<b>1,266,291</b>	<b>1,446,340</b>	<b>1,647,240</b>	<b>1,868,510</b>	<b>2,105,359</b>	<b>2,373,692</b>	<b>2,668,968</b>	<b>2,994,493</b>

**Table 59: Statement of CashFlow for Oleole Minigrid**

### 7.6.4 Payback period – Oleole Minigrid

PAYBACK PERIOD COMPUTATION						
YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD IN YEARS
1	(235,690)	43,771	(191,919)	1	-	
2		49,106	(142,814)	1	-	
3		54,980	(87,834)	1	-	
4		61,451	(26,383)	1	-	
5		68,445	42,062	-	0.4	
				4.0	0.4	4.39

**Table 60: Payback Period for Oleole Minigrid**

## 7.7 Appendix - Chimombo Minigrad Financial Model

### 7.7.1 Statement of Comprehensive Income – Chimombo Minigrad

REVENUE	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Energy Revenue (tarrifs)	US\$ 54,112	US\$ 59,523	US\$ 65,475	US\$ 72,023	US\$ 79,225	US\$ 87,147	US\$ 95,862	US\$ 105,448	US\$ 115,993	US\$ 127,592	US\$ 140,352	US\$ 154,387	US\$ 169,826	US\$ 186,808	US\$ 205,489	US\$ 226,038	US\$ 248,642	US\$ 273,506	US\$ 300,856	US\$ 330,942
<b>Total revenue</b>	<b>54,112</b>	<b>59,523</b>	<b>65,475</b>	<b>72,023</b>	<b>79,225</b>	<b>87,147</b>	<b>95,862</b>	<b>105,448</b>	<b>115,993</b>	<b>127,592</b>	<b>140,352</b>	<b>154,387</b>	<b>169,826</b>	<b>186,808</b>	<b>205,489</b>	<b>226,038</b>	<b>248,642</b>	<b>273,506</b>	<b>300,856</b>	<b>330,942</b>
<b>OPERATING COSTS</b>																				
Salary	921	994	1,074	1,160	1,252	2,336	2,523	2,725	2,943	3,178	3,433	3,707	4,004	4,324	4,670	5,044	5,447	5,883	6,354	6,862
Communication	251	271	293	316	342	369	398	430	465	502	542	585	632	683	737	796	860	929	1,003	1,083
Transport	335	362	390	422	455	492	531	574	620	669	723	780	843	910	983	1,062	1,147	1,238	1,338	1,445
Insurance	1,566	1,566	1,566	1,566	1,566	-	-	1,566	43	171	-	214	1,352	1,566	-	-	1,566	43	214	-
Repairs and maintenance	1,566	1,692	1,827	1,973	2,131	2,301	2,485	2,684	2,899	3,131	3,381	3,652	3,944	4,260	4,600	4,968	5,366	5,795	6,259	6,759
Printing and Stationery	167	181	195	211	228	246	266	287	310	335	361	390	421	455	492	531	573	619	669	722
<b>TOTAL OPERATING COSTS</b>	<b>4,806</b>	<b>5,065</b>	<b>5,345</b>	<b>5,648</b>	<b>5,974</b>	<b>5,744</b>	<b>6,204</b>	<b>8,266</b>	<b>7,279</b>	<b>7,986</b>	<b>8,440</b>	<b>9,329</b>	<b>11,197</b>	<b>12,198</b>	<b>11,482</b>	<b>12,401</b>	<b>14,959</b>	<b>14,507</b>	<b>15,836</b>	<b>16,872</b>
<b>EBIDT</b>	<b>49,306</b>	<b>54,458</b>	<b>60,130</b>	<b>66,375</b>	<b>73,251</b>	<b>81,403</b>	<b>89,658</b>	<b>97,182</b>	<b>108,714</b>	<b>119,607</b>	<b>131,912</b>	<b>145,058</b>	<b>158,629</b>	<b>174,610</b>	<b>194,006</b>	<b>213,637</b>	<b>233,682</b>	<b>258,998</b>	<b>285,021</b>	<b>314,071</b>
Depreciation	4,409	4,409	4,409	4,406	4,534	4,534	4,534	4,534	4,784	4,784	4,786	4,786	5,036	5,036	5,036	5,036	5,411	5,411	5,411	5,411
<b>EBIT</b>	<b>44,897</b>	<b>50,049</b>	<b>55,721</b>	<b>61,969</b>	<b>68,717</b>	<b>76,869</b>	<b>85,124</b>	<b>92,648</b>	<b>103,930</b>	<b>114,822</b>	<b>127,126</b>	<b>140,272</b>	<b>153,593</b>	<b>169,574</b>	<b>188,970</b>	<b>208,601</b>	<b>228,271</b>	<b>253,587</b>	<b>279,609</b>	<b>308,659</b>
Interest on loan	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
<b>EBT</b>	<b>44,846</b>	<b>50,001</b>	<b>55,676</b>	<b>61,927</b>	<b>68,677</b>	<b>76,832</b>	<b>85,089</b>	<b>92,616</b>	<b>103,901</b>	<b>114,795</b>	<b>127,101</b>	<b>140,249</b>	<b>153,573</b>	<b>169,557</b>	<b>188,956</b>	<b>208,589</b>	<b>228,262</b>	<b>253,581</b>	<b>279,605</b>	<b>308,658</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>44,846</b>	<b>50,001</b>	<b>55,676</b>	<b>61,927</b>	<b>68,677</b>	<b>76,832</b>	<b>85,089</b>	<b>92,616</b>	<b>103,901</b>	<b>114,795</b>	<b>127,101</b>	<b>140,249</b>	<b>153,573</b>	<b>169,557</b>	<b>188,956</b>	<b>208,589</b>	<b>228,262</b>	<b>253,581</b>	<b>279,605</b>	<b>308,658</b>

Table 61: Statement of Comprehensive Income \_ Chimombo Minigrad

## 7.7.2 Statement of Financial Position – Chimombo Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	41,041	40,204	39,366	38,529	37,691	36,853	36,016	35,178	34,341	33,503	32,665	31,828	30,990	30,153	29,315	28,478	27,640	26,802	25,965	25,127
Plant and Equipment	111,302	107,860	104,418	100,975	97,533	94,091	90,648	87,206	83,764	80,321	76,879	73,437	69,994	66,552	63,110	59,667	56,225	52,783	49,340	45,898
Computer	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	2.9	57	50	44	38	31	25	19	13	6	-
<b>Total Fixed Assets</b>	<b>152,755</b>	<b>148,346</b>	<b>143,938</b>	<b>139,532</b>	<b>135,998</b>	<b>131,464</b>	<b>126,930</b>	<b>122,396</b>	<b>119,611</b>	<b>114,827</b>	<b>110,101</b>	<b>105,315</b>	<b>103,279</b>	<b>98,242</b>	<b>93,206</b>	<b>88,170</b>	<b>87,259</b>	<b>81,848</b>	<b>76,436</b>	<b>71,025</b>
<b>Current Assets</b>																				
Bank and cash	49,387	103,790	163,868	230,193	302,397	383,756	473,372	570,515	677,193	796,765	928,585	1,073,614	1,229,217	1,403,803	1,597,788	1,811,406	2,040,572	2,299,557	2,584,567	2,898,629
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>49,387</b>	<b>103,790</b>	<b>163,868</b>	<b>230,193</b>	<b>302,397</b>	<b>383,756</b>	<b>473,372</b>	<b>570,515</b>	<b>677,193</b>	<b>796,765</b>	<b>928,585</b>	<b>1,073,614</b>	<b>1,229,217</b>	<b>1,403,803</b>	<b>1,597,788</b>	<b>1,811,406</b>	<b>2,040,572</b>	<b>2,299,557</b>	<b>2,584,567</b>	<b>2,898,629</b>
<b>Total Assets</b>	<b>202,142</b>	<b>252,136</b>	<b>307,806</b>	<b>369,725</b>	<b>438,395</b>	<b>515,219</b>	<b>600,302</b>	<b>692,911</b>	<b>796,804</b>	<b>911,592</b>	<b>1,038,686</b>	<b>1,178,929</b>	<b>1,332,495</b>	<b>1,502,045</b>	<b>1,690,994</b>	<b>1,899,576</b>	<b>2,127,831</b>	<b>2,381,405</b>	<b>2,661,003</b>	<b>2,969,654</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)	(157,164)
Retained Earnings	(44,846)	(94,847)	(150,523)	(212,450)	(281,127)	(357,958)	(443,048)	(535,663)	(639,564)	(754,359)	(881,460)	(1,021,710)	(1,175,283)	(1,344,840)	(1,533,796)	(1,742,385)	(1,970,646)	(2,224,227)	(2,503,833)	(2,812,490)
<b>Total Equity and Reserves</b>	<b>(202,010)</b>	<b>(252,011)</b>	<b>(307,687)</b>	<b>(369,614)</b>	<b>(438,290)</b>	<b>(515,122)</b>	<b>(600,211)</b>	<b>(692,827)</b>	<b>(796,727)</b>	<b>(911,523)</b>	<b>(1,038,624)</b>	<b>(1,178,873)</b>	<b>(1,332,446)</b>	<b>(1,502,003)</b>	<b>(1,690,959)</b>	<b>(1,899,548)</b>	<b>(2,127,810)</b>	<b>(2,381,391)</b>	<b>(2,660,996)</b>	<b>(2,969,654)</b>
<b>Liabilities</b>																				
Bank Loan	(132)	(126)	(119)	(112)	(105)	(98)	(91)	(84)	(77)	(70)	(63)	(56)	(49)	(42)	(35)	(28)	(21)	(14)	(7)	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>(132)</b>	<b>(126)</b>	<b>(119)</b>	<b>(112)</b>	<b>(105)</b>	<b>(98)</b>	<b>(91)</b>	<b>(84)</b>	<b>(77)</b>	<b>(70)</b>	<b>(63)</b>	<b>(56)</b>	<b>(49)</b>	<b>(42)</b>	<b>(35)</b>	<b>(28)</b>	<b>(21)</b>	<b>(14)</b>	<b>(7)</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(202,142)</b>	<b>(252,136)</b>	<b>(307,806)</b>	<b>(369,725)</b>	<b>(438,395)</b>	<b>(515,219)</b>	<b>(600,302)</b>	<b>(692,911)</b>	<b>(796,804)</b>	<b>(911,592)</b>	<b>(1,038,686)</b>	<b>(1,178,929)</b>	<b>(1,332,495)</b>	<b>(1,502,045)</b>	<b>(1,690,994)</b>	<b>(1,899,576)</b>	<b>(2,127,831)</b>	<b>(2,381,405)</b>	<b>(2,661,003)</b>	<b>(2,969,654)</b>

**Table 62: Statement of Financial Position Chimombo Minigrid**

### 7.7.3 Statement of Cashflows – Chimombo Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Net profit from trading	44,846	50,001	55,676	61,927	68,677	76,832	85,089	92,616	103,901	114,795	127,101	140,249	153,573	169,557	188,956	208,589	228,262	253,581	279,605	308,658
Add back interest	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	4,409	4,409	4,409	4,406	4,534	4,534	4,534	4,534	4,784	4,784	4,786	4,786	5,036	5,036	5,036	5,036	5,411	5,411	5,411	5,411
<b>Adjusted trading profit</b>	<b>49,306</b>	<b>54,458</b>	<b>60,130</b>	<b>66,375</b>	<b>73,251</b>	<b>81,403</b>	<b>89,658</b>	<b>97,182</b>	<b>108,714</b>	<b>119,607</b>	<b>131,912</b>	<b>145,058</b>	<b>158,629</b>	<b>174,610</b>	<b>194,006</b>	<b>213,637</b>	<b>233,682</b>	<b>258,998</b>	<b>285,021</b>	<b>314,071</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	157,164	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(157,164)	-	-	-	(1,000)	-	-	-	(2,000)	-	(60)	-	(3,000)	-	-	-	(4,500)	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(60)</b>	<b>-</b>	<b>(3,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(4,500)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan	139	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loan Repayment (Principal plus Interest)	(58)	(55)	(52)	(50)	(47)	(44)	(42)	(39)	(37)	(34)	(32)	(29)	(26)	(24)	(21)	(19)	(16)	(14)	(11)	(8)
<b>Net Cash Flow from Financing Activities</b>	<b>82</b>	<b>(55)</b>	<b>(52)</b>	<b>(50)</b>	<b>(47)</b>	<b>(44)</b>	<b>(42)</b>	<b>(39)</b>	<b>(37)</b>	<b>(34)</b>	<b>(32)</b>	<b>(29)</b>	<b>(26)</b>	<b>(24)</b>	<b>(21)</b>	<b>(19)</b>	<b>(16)</b>	<b>(14)</b>	<b>(11)</b>	<b>(8)</b>
Net Cash flow	49,387	54,403	60,078	66,325	72,204	81,359	89,617	97,143	106,678	119,572	131,820	145,029	155,603	174,586	193,985	213,618	229,166	258,985	285,010	314,062
Cash brought forward	-	49,387	103,790	163,868	230,193	302,397	383,756	473,372	570,515	677,193	796,765	928,585	1,073,614	1,229,217	1,403,803	1,597,788	1,811,406	2,040,572	2,299,557	2,584,567
Cash carried forward	49,387	103,790	163,868	230,193	302,397	383,756	473,372	570,515	677,193	796,765	928,585	1,073,614	1,229,217	1,403,803	1,597,788	1,811,406	2,040,572	2,299,557	2,584,567	2,898,629

**Table 63: Statement of Cash Flows Chimombo Minigrid**

### 7.7.4 Payback period – Chimombo MIngrid

PAYBACK PERIOD COMPUTATION						
YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD IN YEARS
1	(157,164)	44,846	(112,317)	1	-	
2		50,001	(62,316)	1	-	
3		55,676	(6,640)	1	-	
4		61,927	55,287	-	0.1	
				3.0	0.1	3.11

**Table 64: Payback Period Chimombo Minigrid**

## 7.8 Appendix – Mwalija Minigrid Financial Model

### 7.8.1 Statement of Comprehensive Income – Mwalija Minigrid

REVENUE	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Energy Revenue (tarrifs)	US\$ 56,540	US\$ 62,194	US\$ 68,413	US\$ 75,255	US\$ 82,780	US\$ 91,058	US\$ 100,164	US\$ 110,180	US\$ 121,198	US\$ 133,318	US\$ 146,650	US\$ 161,315	US\$ 177,447	US\$ 195,191	US\$ 214,710	US\$ 236,181	US\$ 259,799	US\$ 285,779	US\$ 314,357	US\$ 345,793
<b>Total revenue</b>	<b>56,540</b>	<b>62,194</b>	<b>68,413</b>	<b>75,255</b>	<b>82,780</b>	<b>91,058</b>	<b>100,164</b>	<b>110,180</b>	<b>121,198</b>	<b>133,318</b>	<b>146,650</b>	<b>161,315</b>	<b>177,447</b>	<b>195,191</b>	<b>214,710</b>	<b>236,181</b>	<b>259,799</b>	<b>285,779</b>	<b>314,357</b>	<b>345,793</b>
<b>OPERATING COSTS</b>																				
Salary	921	994	1,074	1,160	1,252	2,336	2,523	2,725	2,943	3,178	3,433	3,707	4,004	4,324	4,670	5,044	5,447	5,883	6,354	6,862
Communication	251	271	293	316	342	369	398	430	465	502	542	585	632	683	737	796	860	929	1,003	1,083
Transport	335	362	390	422	455	492	531	574	620	669	723	780	843	910	983	1,062	1,147	1,238	1,338	1,445
Insurance	1,822	1,822	1,822	1,822	1,822	-	-	1,822	50	200	-	250	1,572	1,822	-	-	1,822	50	250	-
Repairs and maintenance	1,822	1,968	2,125	2,295	2,479	2,677	2,891	3,123	3,372	3,642	3,933	4,248	4,588	4,955	5,351	5,780	6,242	6,741	7,281	7,863
Printing and Stationery	167	181	195	211	228	246	266	287	310	335	361	390	421	455	492	531	573	619	669	722
<b>TOTAL OPERATING COSTS</b>	<b>5,318</b>	<b>5,597</b>	<b>5,899</b>	<b>6,225</b>	<b>6,578</b>	<b>6,120</b>	<b>6,609</b>	<b>8,960</b>	<b>7,759</b>	<b>8,526</b>	<b>8,992</b>	<b>9,961</b>	<b>12,061</b>	<b>13,149</b>	<b>12,234</b>	<b>13,212</b>	<b>16,091</b>	<b>15,461</b>	<b>16,893</b>	<b>17,975</b>
<b>EBIDT</b>	<b>51,222</b>	<b>56,597</b>	<b>62,514</b>	<b>69,029</b>	<b>76,202</b>	<b>84,938</b>	<b>93,555</b>	<b>101,220</b>	<b>113,439</b>	<b>124,793</b>	<b>137,658</b>	<b>151,354</b>	<b>165,386</b>	<b>182,042</b>	<b>202,477</b>	<b>222,969</b>	<b>243,708</b>	<b>270,319</b>	<b>297,464</b>	<b>327,818</b>
Depreciation	5,120	5,120	5,120	5,117	5,246	5,246	5,246	5,246	5,496	5,496	5,498	5,498	5,748	5,748	5,748	5,748	6,123	6,123	6,123	6,123
<b>EBIT</b>	<b>46,102</b>	<b>51,476</b>	<b>57,394</b>	<b>63,912</b>	<b>70,957</b>	<b>79,693</b>	<b>88,309</b>	<b>95,974</b>	<b>107,943</b>	<b>119,297</b>	<b>132,160</b>	<b>145,856</b>	<b>159,638</b>	<b>176,294</b>	<b>196,729</b>	<b>217,221</b>	<b>237,585</b>	<b>264,196</b>	<b>291,341</b>	<b>321,695</b>
Interest on loan	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
<b>EBT</b>	<b>46,052</b>	<b>51,429</b>	<b>57,349</b>	<b>63,869</b>	<b>70,917</b>	<b>79,655</b>	<b>88,274</b>	<b>95,942</b>	<b>107,914</b>	<b>119,270</b>	<b>132,136</b>	<b>145,834</b>	<b>159,619</b>	<b>176,277</b>	<b>196,715</b>	<b>217,209</b>	<b>237,576</b>	<b>264,189</b>	<b>291,337</b>	<b>321,694</b>
Corporate Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net Earnings</b>	<b>46,052</b>	<b>51,429</b>	<b>57,349</b>	<b>63,869</b>	<b>70,917</b>	<b>79,655</b>	<b>88,274</b>	<b>95,942</b>	<b>107,914</b>	<b>119,270</b>	<b>132,136</b>	<b>145,834</b>	<b>159,619</b>	<b>176,277</b>	<b>196,715</b>	<b>217,209</b>	<b>237,576</b>	<b>264,189</b>	<b>291,337</b>	<b>321,694</b>

Table 65: Statement of Comprehensive Income Mwalija Minigrid

## 7.8.2 Statement of Financial Position – Mwalija Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$	US\$
Land and Building	46,487	45,538	44,590	43,641	42,692	41,743	40,795	39,846	38,897	37,949	37,000	36,051	35,102	34,154	33,205	32,256	31,308	30,359	29,410	28,461
Plant and Equipment	130,718	126,676	122,633	118,590	114,547	110,504	106,461	102,419	98,376	94,333	90,290	86,247	82,204	78,162	74,119	70,076	66,033	61,990	57,947	53,904
Computer	374	249	125	-	750	500	250	-	1,500	1,000	500	-	2,250	1,500	750	-	3,375	2,250	1,125	-
Furniture	38	34	29	28	24	20	16	11	7	2.9	57	50	44	38	31	25	19	13	6	-
<b>Total Fixed Assets</b>	<b>177,617</b>	<b>172,496</b>	<b>167,376</b>	<b>162,259</b>	<b>158,013</b>	<b>152,767</b>	<b>147,522</b>	<b>142,276</b>	<b>138,780</b>	<b>133,284</b>	<b>127,846</b>	<b>122,349</b>	<b>119,601</b>	<b>113,853</b>	<b>108,105</b>	<b>102,357</b>	<b>100,734</b>	<b>94,612</b>	<b>88,489</b>	<b>82,366</b>
<b>Current Assets</b>																				
Bank and cash	51,304	107,846	170,308	239,287	314,443	399,337	492,849	594,030	705,432	830,191	967,757	1,119,082	1,281,442	1,463,460	1,665,915	1,888,865	2,128,057	2,398,363	2,695,816	3,023,625
Trade Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>51,304</b>	<b>107,846</b>	<b>170,308</b>	<b>239,287</b>	<b>314,443</b>	<b>399,337</b>	<b>492,849</b>	<b>594,030</b>	<b>705,432</b>	<b>830,191</b>	<b>967,757</b>	<b>1,119,082</b>	<b>1,281,442</b>	<b>1,463,460</b>	<b>1,665,915</b>	<b>1,888,865</b>	<b>2,128,057</b>	<b>2,398,363</b>	<b>2,695,816</b>	<b>3,023,625</b>
<b>Total Assets</b>	<b>228,921</b>	<b>280,343</b>	<b>337,684</b>	<b>401,546</b>	<b>472,456</b>	<b>552,104</b>	<b>640,371</b>	<b>736,306</b>	<b>844,213</b>	<b>963,475</b>	<b>1,095,604</b>	<b>1,241,431</b>	<b>1,401,042</b>	<b>1,577,312</b>	<b>1,774,020</b>	<b>1,991,223</b>	<b>2,228,792</b>	<b>2,492,974</b>	<b>2,784,304</b>	<b>3,105,991</b>
<b>Equity and Liabilities</b>																				
<b>Equity</b>																				
Capital Grant	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)	(182,737)
Retained Earnings	(46,052)	(97,480)	(154,829)	(218,698)	(289,614)	(369,269)	(457,543)	(553,485)	(661,399)	(780,669)	(912,804)	(1,058,638)	(1,218,257)	(1,394,534)	(1,591,248)	(1,808,458)	(2,046,034)	(2,310,223)	(2,601,561)	(2,923,254)
<b>Total Equity and Reserves</b>	<b>(228,788)</b>	<b>(280,217)</b>	<b>(337,566)</b>	<b>(401,435)</b>	<b>(472,351)</b>	<b>(552,006)</b>	<b>(640,280)</b>	<b>(736,222)</b>	<b>(844,136)</b>	<b>(963,405)</b>	<b>(1,095,541)</b>	<b>(1,241,375)</b>	<b>(1,400,994)</b>	<b>(1,577,271)</b>	<b>(1,773,985)</b>	<b>(1,991,195)</b>	<b>(2,228,771)</b>	<b>(2,492,960)</b>	<b>(2,784,298)</b>	<b>(3,105,991)</b>
<b>Liabilities</b>																				
Bank Loan	(132)	(126)	(119)	(112)	(105)	(98)	(91)	(84)	(77)	(70)	(63)	(56)	(49)	(42)	(35)	(28)	(21)	(14)	(7)	-
Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Liabilities</b>	<b>(132)</b>	<b>(126)</b>	<b>(119)</b>	<b>(112)</b>	<b>(105)</b>	<b>(98)</b>	<b>(91)</b>	<b>(84)</b>	<b>(77)</b>	<b>(70)</b>	<b>(63)</b>	<b>(56)</b>	<b>(49)</b>	<b>(42)</b>	<b>(35)</b>	<b>(28)</b>	<b>(21)</b>	<b>(14)</b>	<b>(7)</b>	<b>-</b>
<b>Total Equity and Liabilities</b>	<b>(228,921)</b>	<b>(280,343)</b>	<b>(337,684)</b>	<b>(401,546)</b>	<b>(472,456)</b>	<b>(552,104)</b>	<b>(640,371)</b>	<b>(736,306)</b>	<b>(844,213)</b>	<b>(963,475)</b>	<b>(1,095,604)</b>	<b>(1,241,431)</b>	<b>(1,401,042)</b>	<b>(1,577,312)</b>	<b>(1,774,020)</b>	<b>(1,991,223)</b>	<b>(2,228,792)</b>	<b>(2,492,974)</b>	<b>(2,784,304)</b>	<b>(3,105,991)</b>

Table 66: Statement of Financial Position Mwalija Minigrid

### 7.8.3 Statement of Cashflows – Mwalija Minigrid

DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Net profit from trading	46,052	51,429	57,349	63,869	70,917	79,655	88,274	95,942	107,914	119,270	132,136	145,834	159,619	176,277	196,715	217,209	237,576	264,189	291,337	321,694
Add back interest	51	48	45	43	40	38	35	32	30	27	25	22	19	17	14	12	9	7	4	1
Increase in Debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receipts from debtors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Increase in creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment to creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add back depreciation	5,120	5,120	5,120	5,117	5,246	5,246	5,246	5,246	5,496	5,496	5,498	5,498	5,748	5,748	5,748	5,748	6,123	6,123	6,123	6,123
<b>Adjusted trading profit</b>	<b>51,222</b>	<b>56,597</b>	<b>62,514</b>	<b>69,029</b>	<b>76,202</b>	<b>84,938</b>	<b>93,555</b>	<b>101,220</b>	<b>113,439</b>	<b>124,793</b>	<b>137,658</b>	<b>151,354</b>	<b>165,386</b>	<b>182,042</b>	<b>202,477</b>	<b>222,969</b>	<b>243,708</b>	<b>270,319</b>	<b>297,464</b>	<b>327,818</b>
<b>Cash Flows from Investing Activities</b>																				
Grant	182,737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed asset additions	(182,737)	-	-	-	(1,000)	-	-	-	(2,000)	-	(60)	-	(3,000)	-	-	-	(4,500)	-	-	-
<b>Net Cash Flow from Investing Activities</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(1,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,000)</b>	<b>-</b>	<b>(60)</b>	<b>-</b>	<b>(3,000)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(4,500)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cash Flow from Financing Activities</b>																				
Bank loan	139	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loan Repayment (Principal plus Interest)	(58)	(55)	(52)	(50)	(47)	(44)	(42)	(39)	(37)	(34)	(32)	(29)	(26)	(24)	(21)	(19)	(16)	(14)	(11)	(8)
<b>Net Cash Flow from Financing Activities</b>	<b>82</b>	<b>(55)</b>	<b>(52)</b>	<b>(50)</b>	<b>(47)</b>	<b>(44)</b>	<b>(42)</b>	<b>(39)</b>	<b>(37)</b>	<b>(34)</b>	<b>(32)</b>	<b>(29)</b>	<b>(26)</b>	<b>(24)</b>	<b>(21)</b>	<b>(19)</b>	<b>(16)</b>	<b>(14)</b>	<b>(11)</b>	<b>(8)</b>
Net Cash flow	51,304	56,542	62,462	68,979	75,155	84,894	93,513	101,181	111,402	124,758	137,566	151,325	162,359	182,018	202,455	222,950	239,192	270,305	297,453	327,810
Cash brought forward	-	51,304	107,846	170,308	239,287	314,443	399,337	492,849	594,030	705,432	830,191	967,757	1,119,082	1,281,442	1,463,460	1,665,915	1,888,865	2,128,057	2,398,363	2,695,816
<b>Cash carried forward</b>	<b>51,304</b>	<b>107,846</b>	<b>170,308</b>	<b>239,287</b>	<b>314,443</b>	<b>399,337</b>	<b>492,849</b>	<b>594,030</b>	<b>705,432</b>	<b>830,191</b>	<b>967,757</b>	<b>1,119,082</b>	<b>1,281,442</b>	<b>1,463,460</b>	<b>1,665,915</b>	<b>1,888,865</b>	<b>2,128,057</b>	<b>2,398,363</b>	<b>2,695,816</b>	<b>3,023,625</b>

**Table 67: Statement of Cash Flows Mwalija Minigrid**

#### 7.8.4 Payback period – Mwalija Minigrid

YEAR	INITIAL INVESTMENT	NET BENEFIT	CUMULATIVE BENEFIT	FULL YEARS	PART OF YEAR	PAY PERIOD IN YEARS
1	(182,737)	46,052	(136,685)	1	-	
2		51,429	(85,257)	1	-	
3		57,349	(27,908)	1	-	
4		63,869	35,961	-	0.4	
				3.0	0.4	3.44

**Table 68: Payback Period Mwalija Minigrid**