

Online Catalogue:

LOCAL SUSTAINABLE SOLUTIONS IN EAST AFRICA – Light, Electricity

www.localsolutions.inforse.org

Collection of Successful Cases of Sustainable Energy and Climate Solutions in Kenya, Uganda, and Tanzania.

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The Catalogue is published by Partners of the Project "East African Civil Society for Sustainable Energy & Climate Action" (EASE-CA), a Project by members of the civil society network INFORSE - International Network for Sustainable Energy. The Partners are: JEEP and UCSD in Uganda, Suswatch in Kenya, TaTEDO in Tanzania, which is also INFORSE-East Africa Coordinator, Nordic Folkecenter for Renewable Energy (NFRE), and INFORSE Secretariat in Denmark. More on the EASE-CA Project: www.inforse.org/africa/EASE.htm. The online database behind the Catalogue is designed by NFRE. The EASE-CA Project is supported by CISU - Civil Society in Development, Denmark in 2019-22.

Catalogue generated on:

03.11.2026

Sunking Pico-plus solar lamp





Why to choose this solution?

The Sunking P-co-plus strikes the perfect balance between performance and affordability. It is mobile you can take it anywhere with ease for work, study, or travel. It is designed to meet essential lighting needs. Provides up to 72 hours of light on a single charge, it is 5 times brighter than a kerosene lamp and has a dual charging option.

Savings per day or production:

It helps save a maximum of 2000 Uganda shillings (USD 1) per day which will have been spent on buying Kerosene hence reducing on household expenditures.

Cost in money and in own time to construct:

Sunking Pico-plus solar lamp costs 30,000 Uganda shillings (USD 8).

Lifetime:

It has a 5 year battery life. After the 5 years the battery may need replacement.

Maintenance needed:

The lamp should not be left out in rain. Put the lamp in the sunlight for charging. Needs to be stored under a dry place.

Resources needed in use:

Sunlight for charging; the panel, the LED, and the battery are all inbuilt.

Problems and limits:

The initial investment is somewhat high, which may make it inaccessible to low-income households. During the rainy season, once not charged it maynot be able to provide sufficient light.

Where and how can you get it or make it?

JEEP folkecenter and other solar distribution outlets across the county.

Skills needed to produce, install. maintenance, use:

Production of the Sunking Pico-plus needs a technical personnel. Use and maintenance only needs a small introduction.

How to use it:

Not applicable

How to maintain it:

Not applicable

Climate effect (if any):

It is environment-friendly since there is no emission of carbon. Solarlampsrun solely on natural radiation from

the sun. The lamp reduces carbon emissions to the atmosphere in cases where kerosene lamps are used, hence conserving the environment. It is simple, reliable, and safe to the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It has contributed greatly to reduction of kerosene- and candle-related accidents and deaths in homes. It has improved health and increased productive hours, since all of the family can use it at the same time for different activities.

If you can make it, a short description, typical problems, materials needed:

It requires a skilled and technical personnel to produce.

How to make it (if possible):

Not applicable

How is it delivered and by whom?

Successful financial model

Support from donor agencies and other development partners provides these lamps at a subsidized price.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy and Mineral Development as well as the Ministry of Water and Environment, are conducting training of communities on the benefits of solar energy. Training and advocacy are being provided in communities to instill positive attitudes toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar power in off-grid, peri-urban, and rural areas. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

More info:

Email: info@jeepfolkecenter.org https://jeepfolkecenter.org/

Sources:

Joint Energy and Environment Projects

Case uploaded:

0000-00-00

Gaitheri Secondary School Solar PV Roof





Why to choose this solution?

The iron-sheet roof is covered in tiles fitted with energy-producing solar cells, an innovative solar- power technology known as building-integrated photovoltaic (BIPV) offering an alternative to adding solar panels on top of a conventional roof to produce power from the sunâ€™s energy. The energy thus produced has enabled students to improve their performance thanks to more reliable power, which means they can study even after dark. This solution also buffers the school against failures of a costly and unreliable national grid power.

Savings per day or production:

The solar tiles have reduced the school spending on electricity from KSh 5,000 (USD 50) per month, which is largely a fixed charge for access to grid power, to 1,500 KSh (USD 15) a month, or KSh 50 (USD 0.5) per day. This has translated to savings of about KSh 3,500 (USD 35) per month.

Cost in money and in own time to construct:

A grant of USD 2,000 (KSH 200,000) from the United States African Development Foundation (USADF) through Young African Leaders Initiative (YALI) was provided to implement the Gaitheri solar-roof project.

Lifetime:

30 years, if kept in good condition.

Maintenance needed:

The only maintenance required by the system is to clean the tiles regularly, when they are covered with dust or leaves.

Resources needed in use:

Iron sheet roofs, Building Integrated Photovoltaic (BIPV) tiles, sunlight, power control unit, a battery bank of 8-Volt batteries.

Problems and limits:

Installing solar panels on the roof is expensive. Its intake is reduced by cool, cloudy, or foggy weather. Market penetration is still slow, given that the technology is new and will require some time to achieve acceptance among a wider customer base. Lack of awareness on the potential of photovoltaics is widespread.

Where and how can you get it or make it?

It is available in Kiharu Constituency, within the Muranga County. The system is provided by Strauss Energy.

Skills needed to produce, install. maintenance, use:

Production, installation, and maintenance need expertise in engineering, energy, and construction. The use requires only a short introduction.

How to use it:

To be added.

How to maintain it:

Not relevant.

Climate effect (if any):

The school no longer uses kerosene and candles, which emit smoke, a source of global black carbon that is detrimental to health and that also worsens to global climate change.

Why is it successful?

It is successful because it ensures uninterrupted power supply for the computer lab. The system has a power control system, and there is no danger of power surges that are used to destroy plugged- in electrical gadgets after a blackout. Thus, the system has reduced related losses for repair or replacement of affected gadgets. The system also costs little to operate and to maintain.

If you can make it, a short description, typical problems, materials needed:

Materials include an iron-sheet roof, Building Integrated Photovoltaic (BIPV) tiles, power control unit, and a bank of 8-Volt batteries.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

The business model is installation by Strauss Energy, providing renewable and cost-effective energy through BIPV technology, a revolutionary solar- powered roofing tile designed and made in Kenya. Through the YALI program, Strauss Energy received a grant of USD 2,000 from the United States African Development Foundation (USADF) to implement the Gaitheri solar-roof project.

Successful financial model

Support for development and public relations through Strauss Energy.

What policies and strategies helped the success?

Received a grant from the United States African Development Foundation (USADF) through the YALI program to implement the solar-roof project.

More info:

http://straussenergy.com/

Sources:

Strauss Energy, Climate Innovation Centre CIC, 3rd Floor, Strathmore Business School (SBS),Ole Sangale Close, Madaraka. P. O. Box 15028- 00100, Nairobi, Kenya. Tel: +254 020 440 9938 | +254 733 448438, Email: infor@straussenergy.com

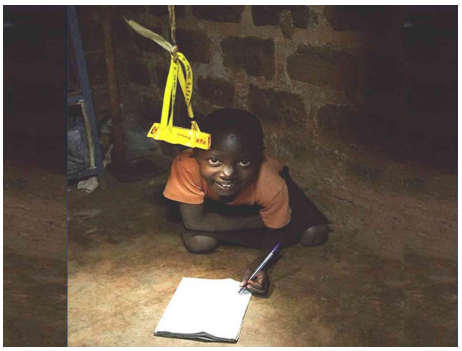
Case uploaded:

2020-08-24

Little Sun Solar Lamp







Why to choose this solution?

The solution provides light in homes and can also be used as torch. It helps in lighting for homes, it has Dimensions of 12x2.9cm and weight of 120 g including batteries and all is recyclable. The solar panel has PV of 0.5W and battery capacity of 500 mAh.

Savings per day or production:

The Little Sun solar lamp reduces financial bills, since it is bought once and replaces paraffin or candles for lighting. This helps the family to save money to be used for other domestic needs. It helps by reducing indoor-pollution-related diseases of the lungs and eyes. It also helps in reducing accidents caused by kerosene lamps and candles in the homes. It is environment-friendly, as there is no release of CO2/kWh emission, when used. These factors, combined with customer experiences, show the lamp to be technically proven, environment friendly, and economically better.

Cost in money and in own time to construct:

The lamp is very cheap compared to the price of buying paraffin each day. The lamp costs USh 35,000 (USD 10).

Lifetime:

The lamp has two-year warranty. The battery will last up to five years when used daily.

Maintenance needed:

The lamp should not be left out in rain. Put the lamp in the sunlight for charging.

Resources needed in use:

Sunlight for charging; the panel, the LED, and the battery are all inbuilt.

Problems and limits:

The intervals between charges of the battery become shorter over time with repeated recharging; they must be charged for at least eight hours on the first use. The initial investment is somewhat high, which may make it inaccessible to low-income households.

Where and how can you get it or make it?

JEEP is promoting these lamps in many districts of Uganda. So far, 7552 lamps have been distributed. This solar lamp is designed in Germany, manufactured in China, then airlifted to Uganda. In Uganda it can be accessed at JEEP Folkecenter.

Skills needed to produce, install. maintenance, use:

Requires skilled personnel to produce. Maintenance and use do not require unusual skills.

How to use it:

Not relevant.

How to maintain it:

Not relevant.

Climate effect (if any):

It is environment-friendly since there is no emission of carbon. Solar lamps run solely on natural radiation from the sun. The lamp reduces carbon emissions to the atmosphere in cases where kerosene lamps are used, hence conserving the environment. It is simple, reliable, and safe to the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It has contributed greatly to reduction of kerosene- and candle-related accidents and deaths in homes. It has improved health and increased productive hours, since all of the family can use it at the same time for different activities.

If you can make it, a short description, typical problems, materials needed:

Trained personnel are required to make this product.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

The business model for the Little Sun solar lamp involves procuring the products and selling them to the end-users. This lamp is tested by Uganda National Bureau of Standards and can be purchased by any person in Uganda. The lamp can be accessed from JEEP Folkecenter in Uganda.

Successful financial model

Support from donor agencies and other development partners provides these lamps at a subsidized price.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy and Mineral Development as well as the Ministry of Water and Environment, are conducting training of communities on the benefits of solar energy. Training and advocacy are being provided in communities to instill positive attitudes toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar power in off-grid, peri-urban, and rural areas. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

More info:

https://littlesun.com/uganda/ and JEEP

Sources:

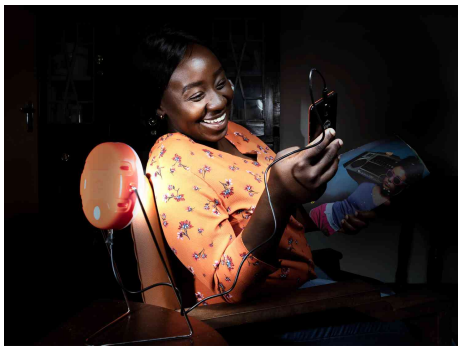
7 Miles, Gayaza Rd, Kyanja,Kampala, P. O. Box 4264, Uganda. Tel: +256 414 578 316. Email: info@jeepfolkecenter.org. https://jeepfolkecenter.org/

Case uploaded:

2020-10-15

Solar Lamp D.light S200







Why to choose this solution?

The d.light S200 solar lantern is lightweight (only 50 grams), affordable mobile charging lantern,has a unique dome lens that spreads soft ambient lighting throughout the room, and its long-lasting battery allows charging of mobile phones via its USB port.The S200 also provides three different brightness settings, from "Low" to "High", to suit the user need. Whether it is working at night or simply socializing, the S200 is a constant companion. Its battery produce 20 hours of light per full charge.

Savings per day or production:

The d.light S200 solar lantern is affordable mobile charging lantern with double the savings. Saves the user about KSH 150(USD 1.5) per day used on kerosine and phone charging.

Cost in money and in own time to construct:

Costs KSH 2,500(USD 25).

Lifetime:

Five years if used accordingly.

Maintenance needed:

D.light S200 is maintenance free.

Resources needed in use:

Uses Solar energy to charge the solar panel that is plugged into the lantern.

Problems and limits:

The price of d.light S200 is a bit high and not easily affordable by most of the rural poor communities.

Where and how can you get it or make it?

D.light lamp products are available in over 25,000 retail outlets around the globe. One can also purchase the products online.

Skills needed to produce, install. maintenance, use:

Only produced and installed by skilled persons from D.light company.The d.light S200 is maintainance free and its easy and simple to use, just press of a button and adjusting brightness settings.

How to use it:

https://fb.watch/cmpRHl16ML/ (video by d.light design Facebook)

How to maintain it:

Not relevant,

Climate effect (if any):

D.light S200 lamps are environmentally friendly since they do not emit carbon and also saves the atmosphere

from carbon emitted by kerosine lamps.

Why is it successful?

Successful because they are excellent product, readily available, affordable and the payGo startegy that serves the customers better. D.light leads the way with a two-year warranty and dealer support through field-based staff, marketing materials, and in-country call centers. 90% of d.light customers rate their product as a good value for money and would recommend d.light to a friend.

If you can make it, a short description, typical problems, materials needed:

Only made by skilled personel from D.light company.

How to make it (if possible):

Not relevant

How is it delivered and by whom?

D.light has a global network of excellent distribution partners that enable them reach customers across the world.

Successful financial model

Support from investors, they enable payment with PayGo technology

What policies and strategies helped the success?

PayGo strategy, undertaking sales promotion,the Energy(Solar Water Heating) Regulations 2012 has enhaced surge in solar use in Kenya,D.light S200 also meets Lighting Global quality standards.

More info:

https://www.dlight.com/product/s200/

Sources:

https://www.dlight.com/product/s200/

Case uploaded:

2022-05-05

Solar Sisters Lamp System - Sunking Home 120







Why to choose this solution?
The lamp can light up to 4 rooms for up to 24 light hours, charges up to 3 phones and it has a security light.

Savings per day or production:
The solar powered lamp can save 1200 Tsh per day

Cost in money and in own time to construct:
N/A

Lifetime:
5 Years lifetime, replaceable during warranty

Maintenance needed:
After 5 years, repair of plastic nylon is needed.

Resources needed in use:
Solar power in form of sunshine.

Problems and limits:
Not easily affordable by very poor communities.

Where and how can you get it or make it?
Available at Solar Sister Entrepreneurs.

Skills needed to produce, install. maintenance, use:
Fabricated in industry, repair need special skills.

How to use it:
https://www.youtube.com/watch?v=makgV217HEk

How to maintain it:
https://www.youtube.com/watch?v=2qljxg8qxrc

Climate effect (if any):
The solar lamp reduces CO2 emission and it is environmental friendly.

Why is it successful?
It is affordable, clean and reliable source of light.

If you can make it, a short description, typical problems, materials needed:
N/A

How to make it (if possible):
N/A

How is it delivered and by whom?

Successful financial model

What policies and strategies helped the success?

The Tanzanian government supports solar projects in several ways; through legislation as well as by providing financial support. Projects which qualify for such funding might take different forms, and range from lighting initiatives to large-scale solar PV fields.

More info:

Sources:

https://solarsister.org/

Case uploaded:

2022-05-02

Sunking Pico-Plus Solar Lamp







Why to choose this solution?

The Sunking Pico-Plus Lamp is an upgraded model of the original popular model of Little Sun. It is mobile, you can take it anywhere with ease for work, study, or travel. It provides up to 72 hours of light on a single charge, which is is 5 times brighter than a kerosene lamp and has a dual charging option. You can charge the PV panel on the lamp with sun, but also from electric plug through an USD stick.

Savings per day or production:

It helps to save about 2000 Uganda shillings (USD 1) per day, compared to buying Kerosene, hence reducing on household expenditures.

Cost in money and in own time to construct:

Sunking Pico-plus solar lamp costs 30,000 Uganda shillings (USD 8).

Lifetime:

It has a 5 year battery life. After the 5 years the battery may need replacement.

Maintenance needed:

The lamp should not be left out in rain. Put the lamp in the sunlight for charging. Needs to be stored under a dry place.

Resources needed in use:

Sunlight for charging; the panel, the LED, and the battery are all inbuilt.

Problems and limits:

The initial investment is somewhat high, which may make it inaccessible to low-income households. During the rainy season, once not charged it maynot be able to provide sufficient light.

Where and how can you get it or make it?

JEEP Folkecenter and other solar distribution outlets across the county.

Skills needed to produce, install. maintenance, use:

Production of the Sunking Pico-plus needs a technical personnel. Use and maintenance only needs a small introduction.

How to use it:

How to maintain it:

Climate effect (if any):

It is environment-friendly since there is no emission of carbon. Solarlamps run solely on natural radiation

from the sun. The lamp reduces carbon emissions to the atmosphere in cases when they are used instead of kerosene lamps, hence conserving the environment. It is simple, reliable, and safe to the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It has contributed greatly to reduction of kerosene- and candle-related accidents and deaths in homes. It has improved health and increased productive hours, since all of the family can use it at the same time for different activities.

If you can make it, a short description, typical problems, materials needed:

It requires a skilled and technical personnel to produce.

How to make it (if possible):

How is it delivered and by whom?

Successful financial model

Support from donor agencies and other development partners provides these lamps at a subsidized price.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy and Mineral development as well as the Ministry of Water and Environment, are conducting training of communities on the benefits of solar energy. Training and advocacy are being provided in communities to instill positive attitudes toward environmental conservation. The government, through the Ministry of Health, is encouraging promotion of solar power in off-grid, peri-urban, and rural areas. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

More info:

Email: info@jeepfolkecenter.org https://jeepfolkecenter.org/ and
https://sunking.com/solar-lanterns/sun-king-pico-plus/

Sources:

Joint Energy and Environment Projects, Uganda.

Case uploaded:

2023-01-23

Kibindu Gasifier and Solar Hybrid Mini-Grid





Why to choose this solution?

Rural electrification is a critical challenge in developing countries, and Tanzania is no exception. Kibindu Village is located in the Chalinze District of the Coast Region and has a population of about 10,000 people. Up to and including the year 2015, diesel generators were the main sources of electricity for the villagers. The solution provided is to facilitate generation of electricity through a hybrid mini-grid system and to develop a distribution network. Kibindu mini-grid is a hybrid system of biomass gasifier system (20kW/32KVa) and solar PV (20kW). The gasifier uses maize cobs as a feedstock to generate electricity. The village has the potential to supply 40 tonnes of maize cobs per season. The Kibindu mini-grid can supply electricity to more than 200 households, SMEs, and institutions. Kibindu mini-grid is a renewable energy-based system supplying reliable and clean electricity to villagers who previously had to rely on wicked lamps, candles, and diesel generators for lighting and for productive activities.

Savings per day or production:

Customers receiving their power from the mini-grid realize significant savings in comparison to the costs to them for diesel generators, formerly their only major power source. Savings of time and money have also been realized by local government officials at village and ward offices, as they are no longer traveling to town for stationery and printing services. Social services have improved, and time frames for executing business services have been shortened.

Cost in money and in own time to construct:

Installation of the two systems (gasifier and solar) and the distribution network (grid) cost about USD 200,000.

Lifetime:

About 15 to 20 years for the solar panel and the gasifier; three to four years for solar batteries.

Maintenance needed:

For the gasifier, maintenance of the combustion engine is needed in case tar accumulates. For the solar part, maintenance requirements are relatively easy; even more so for the batteries.

Resources needed in use:

Biomass, in this case maize cobs; and solar energy.

Problems and limits:

With biomass gasifiers, too much particulate matter, tar, or other residues decreases the lifetime of the combustion engine and makes frequent maintenance necessary. The main strategy to address this challenge is to equip gasifier systems with a gas filter. This raises the costs, requires frequent cleaning of the filter system, and often produces much carcinogenic waste, especially in the case of wet stripping of the gas. Sometimes obtaining gasifier feedstock is a challenge.

Where and how can you get it or make it?

This system is installed in Kibindu village, Chalinze District, Coast Region in Tanzania.

Skills needed to produce, install. maintenance, use:

Skilled technicians are required for installation, maintenance, and operation of the gasifier as well as of the solar hybrid mini-grid system.

How to use it:

https://www.youtube.com/watch?v=IsHP45imXj0

How to maintain it:

https://www.youtube.com/watch?v=WLV-FgxRx4g

Climate effect (if any):

Electricity generated from the hybrid mini-grid in Kibindu has reduced the use of fossil fuels and thereby has helped to lower the villageâ€™s CO2 emissions. Emissions that would have resulted from decomposition of maize cobs are avoided through conversion of waste to energy. Solar power is renewable energy.

Why is it successful?

The rate of rural electrification is still low in the country (only about 17%). Demand for sustainable energy for both domestic and business purposes is growing rapidly.

If you can make it, a short description, typical problems, materials needed:

Not relevant.

How to make it (if possible):

https://www.youtube.com/watch?v=lHuD5rOiv_M

How is it delivered and by whom?

Actors: SESCOM company, Husk Power Company of Tanzania (developers), USAID development partner/donor, Kibindu villages (customer/users), REA, EWURA, Ministry of Energy, District and village authority. Part of the installation costs were covered by USADF Power Africa Grant. The system is managed by SESCOM and Husk Power; maintenance and operational costs are charged in customer bills through a pay-as-you-go system.

Successful financial model

Grant funds covered capital costs. Operational costs are recovered from payment of electricity bills.

What policies and strategies helped the success?

The first and second generation Small Power Producers (SPP) Frameworks developed by the government of Tanzania, 2008 and 2015.

More info:

Read more: http://www.tatedo.org/medias/news-articles/43-kibindu and https://www.retc.co.tz/post/Industrial-Visits-for-September-2019

Sources:

TaTEDO, MbeziJuu, Mpakani Road, Goba, House No GOB/KZD/883, P. O. Box 32794, Dar es Salaam, Tanzania. Tel: +255 738-201498, E-mail: energy@tatedo.or.tz, http://www.tatedo.or.tz

Case uploaded:

2020-09-27

Rainmaker Solar-Powered Water Pump





Why to choose this solution?

The Rainmaker is a portable solar-powered water-pumping system designed for small-scale farming and household use. It can lift water to a maximum height of 100 m, with a capacity of seven cubic meters per day, ensuring a steady supply of water for farming and household needs. It can provide sufficient water for up to 1.5 acres of irrigation. It can also be used for livestock and domestic household needs. The Rainmaker pumps a lot of water and does not use any fuel other than sunlight.

Savings per day or production:

Initially, users of electric water pumps used to irrigate crops had to pay an average of KSh 4,500- 5,000 (USD 45-50) in monthly electricity bills. Running the Rainmaker system now costs KSh 2,500-2,800 (USD 25-28) per month, saving about KSh 2,200 (USD 22) per month, i.e., KSh 73 (USD 0.73) per day.

Cost in money and in own time to construct:

Costs KSh 50,000 (USD 500). A survey fee of KSh 4,500 (USD 45) is charged when a field agent visits a site, of which KSh 2,000 (USD 20) is a sales analysis fee. Installation usually takes one day, and the technician conducts proper on-site training for end-users.

Lifetime:

Not specified.

Maintenance needed:

Post-installation issues such as permanently mounting solar modules of the Rainmaker pump on the roof.

Resources needed in use:

Water, and solar power.

Problems and limits:

Entry of cheaper fake and counterfeit products into the Kenyan market affects customer trust and confidence that have been built in their products so far and could have a negative impact on sales.

Where and how can you get it or make it?

In Kenya, SunCulture, a private company supplying Rainmaker systems, has its main office in Nairobi as well as sales outlets in Eldoret (Uasin Gishu County), Nakuru (Nakuru County), Mitunguu (Meru County), Mutithi (Kirinyaga County), and Matanya (Laikipia County), with more being planned to cater for growing demand. It supplies its products to all parts of Kenya, with most of their sales done through Facebook, radio, and direct enquiries made at the head office. In Africa, SunCulture has supplied solar water-pumping systems to Zambia (where there is a distributor), Uganda, Somalia, Ethiopia, Rwanda, Nigeria, Ghana and Mozambique.

Skills needed to produce, install. maintenance, use:

Production, installation, and maintenance require engineering skills. Use of the system requires training.

How to use it:

To be added.

How to maintain it:

To be added.

Climate effect (if any):

Not specified.

Why is it successful?

An important contribution to their success is that Sunculture has constantly designed and redesigned Rainmaker systems to meet farmersâ€™ needs. Rainmaker also pumps a lot of water and does not use any fuel. Can be used in several ways, e.g., for livestock and domestic household needs. The pump is suitable for many water sources including wells, boreholes, dams, and lakes.

If you can make it, a short description, typical problems, materials needed:

Materials needed include a 24V stainless-steel submersible water pump; 120-Watt portable solar modules; a 480-Watt-hour 24V waterproof battery bank paired with a Weather Smart Maximum Power Point Tracking (MPPT) charge controller in a lockable waterproof portable case; and a brass impact sprinkler with a 10-m radius.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

Installation of Rainmaker solar-powered water pumps is done by SunCulture Company, which has a dedicated team of 75 staff of which 60% are male and 40% female, based in various parts of the country. These include 16 full-time field-based technicians and 30 field-sales agents who provide installation services to the customers after conducting surveys. The field agents work in, and report to regional representatives in, three main regions, namely Western, Central, and the Coastal Area.

Successful financial model

SunCulture operations are currently supported by grant funding, by income from sales, and by strategic partnerships. Key funding partners include the Shell Foundation, USAID, and Microsoft, among others. The company has also attracted investment from international institutions such as Energy Access Ventures and Partners Group, which has enabled them to add business management, to widen their geographic reach, and to recruit sector-specific partners.

What policies and strategies helped the success?

The overall policy environment is favourable for SunCulture operations in Kenya, to which they can import all their products with ease. Imported solar irrigation systems are tax-exempt, and this favourable regulatory framework contributes to lower selling prices.

More info:

http://www.sunculture.com/

Sources:

SunCulture, 236, Owashika Road, Lavington, Nairobi, Kenya. Tel.: +254 700 327 002, E-mail: info@sunculture.com

Case uploaded:

2020-08-27

Small Wind Turbine - Do-it-yourself model





Why to choose this solution?

Provided that favorable wind resources are in place, small wind turbines can deliver considerable benefits for individuals or small communities. They are relatively easy to build. They can deliver important amounts of energy which can be used for a large variety of applications, from battery-charging to powering equipment. Compared to photovoltaic panels, they operate also during the night and in winter, when the sun is weaker in many regions of the world. Additionally, by producing AC current they can easily be coupled to standard electrical equipment.

Savings per day or production:

Savings are difficult to estimate, since it depends a lot on the weather conditions where the wind turbine is installed; however, once installed in the correct location, the wind turbine can deliver electricity for several years.

Cost in money and in own time to construct:

An average cost of USD 200 to 1,000 should be expected when using quality components, but the final cost can be lowered if recycled materials are used. Additionally, cheaper solutions can be found online, but the quality of the product deliver is not always matching the requirements.

Lifetime:

If built correctly, the small wind turbine should last a minimum of 15-20 years.

Maintenance needed:

Limited.

Resources needed in use:

Wood, steel, copper wires, magnets, bearings, epoxy resin (or equivalent).

Problems and limits:

Although the construction can be done by anyone, a certain knowledge of handling tools is required. Furthermore, some locations may require a taller tower, due to limited wind resources.

Where and how can you get it or make it?

A construction manual can be purchased online: https://pureselfmade.com/

Skills needed to produce, install. maintenance, use:

Knowledge of working with tools and someone to instruct (or a manual).

How to use it:

Not relevant.

How to maintain it:

Not available.

Climate effect (if any):

The installation and usage of a wind turbine means that electricity can be produced freely for the whole lifetime of the turbine. This means that fewer or no diesel generators will be needed, resulting in a considerable reduction in emissions.

Why is it successful?

Relatively simple construction which can deliver free electricity for several years.

If you can make it, a short description, typical problems, materials needed:

It is necessary to either attend a course or to follow the manual.

How to make it (if possible):

Not available yet.

How is it delivered and by whom?

Materials are quite basic and can be purchased everywhere.

Successful financial model

Not relevant.

What policies and strategies helped the success?

Open source model.

More info:

http://folkecenter.eu/pages/Publications_and_downloads_full.php#Wind

Sources:

https://pureselfmade.com/ and Nordic Folkecenter for Renewable Energy, Denmark.

Case uploaded:

2020-12-11

Solar-PV-Powered Refrigerator





Why to choose this solution?

The solar refrigerator is a cooling unit that uses electricity produced by a photovoltais (PV) solar cell panel and stored in a battery. The fridge typically has low-voltage (12V or 24 V) input. They can be used in hospitals, homes, and for commercial purposes like shops and dairy products. They are used mostly in off-grid areas. The size typically varies from 10 to 85 liters

Savings per day or production:

The solar-powered fridge helps to reduce financial bills, as once it is installed, there are no monthly bills for electricity to run it. This also helps to save money because the expenditures are reduced for buying ice blocks and diesel or petrol for generators to keep drugs and foods fresh daily in off-grid / on- grid areas. It is environment-friendly, as there is no release of CO2/kWh emission from a solar-based refrigeration system.

Cost in money and in own time to construct:

The solar-powered fridge helps to reduce financial bills, as once it is installed, there are no monthly bills for electricity to run it. This also helps to save money because the expenditures are reduced for buying ice blocks and diesel or petrol for generators to keep drugs and foods fresh daily in off-grid / on- grid areas. It is environment-friendly, as there is no release of CO2/kWh emission from a solar-based refrigeration system.

Lifetime:

It is durable. The refrigerator has a lifespan of over 10 years, the solar panel 15 years, and the batteries last 5 year.

Maintenance needed:

Unlike traditional refrigerators, there is no need for any fuel or gas. The panel must be cleaned regularly to remove dirt that can prevent sun rays from reaching the panel. The refrigerator does not need regular checking, except the usual cleaning.

Resources needed in use:

Sunlight, panel, batteries, refrigerator, wires, regulator.

Problems and limits:

Requires a relatively big investment. The initial cost involved is high, which makes it unavailable to people with low incomes. There may be a lack of good quality materials or equipment in the markets. Improper connections of wire to the refrigerator can cause short circuit.

Where and how can you get it or make it?

JEEP is promoting it. It has been installed in health centres and green power units on Ssese islands for business purposes. The solar-powered refrigerator can be purchased from shops in Uganda that sell solar equipment, or it can be shipped from China, England, Germany, etc. It will then require installation with solar panel.

Skills needed to produce, install. maintenance, use:

A trained electrical engineer must install the system and orient the end-user to start using the solar refrigerator.

How to use it:

Not necessary.

How to maintain it:

Not necessary.

Climate effect (if any):

It is environment-friendly, since there is no emission of carbon. Solar-powered refrigerators run solely on natural radiation from the sun. The system reduces carbon emissions to the atmosphere when it replaces use of generators for power. It is simple, reliable, and safe for the person operating it. It is also energy-efficient.

Why is it successful?

It is efficient and can be operated easily. It is well known and can be used in several places, e.g., for hospitals and green enterprises. It has greatly contributed to improved services at health facilities, keeping medicines and vaccines cool. Hence, it has helped to reduce the infant mortality rate in many off-grid areas. After the equipment is purchased, professional maintenance can be done after 3 -5 years.

If you can make it, a short description, typical problems, materials needed:

Not applicable. Requires trained personnel.

How to make it (if possible):

Not relevant.

How is it delivered and by whom?

The business model of the refrigerator is through procuring the refrigerator, batteries, solar panels, inverter, and other accessories. A professional electrical engineer installs these. It can be adopted and acquired by various parties through the private sector, NGOs, and government. To ensure quality, Uganda National Bureau of Standards (UNBS) and Uganda Solar Electrification Association (USEA) certify the solar equipment. The effectiveness of the solar fridges encourages people to buy these solar-powered refrigerators. Solar Associations and CSOs have promoted the use of solar energy. JEEP also promotes these technologies.

Successful financial model

Support from government and other development partners provides these refrigerators mainly in hospitals as well as in small-scale enterprises in rural, peri-urban, and off-grid areas. Establishment of solar associations has occurred. There has been training of local electricians, and â€œstart your own businessâ€• incentives have been offered.

What policies and strategies helped the success?

Government programs implemented by different ministries, for example the Ministry of Energy, are conducting training of communities on use of solar energy and use of equipment that can be installed, to encourage people to get equipment. The Uganda Ministry of Energy has brought together organisations that can procure equipment for a group, which remits funds to the organisation; it is also cheaper for the group. Training and advocacy in communities promote positive attitudes toward environmental conservation. The government, through the Ministry of Health, is promoting solar refrigerators in off-grid, peri-urban, and rural hospitals to facilitate drug and vaccine storage. There are many solar subsidies and tax waivers, which have been put in place through the Uganda revenue authority.

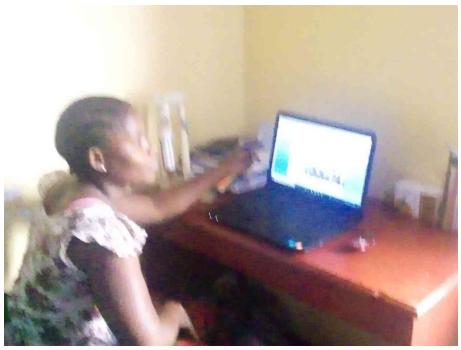
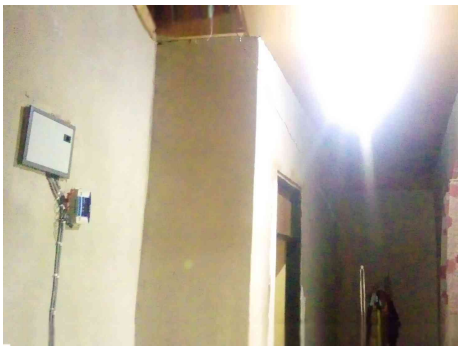
More info:

https://apps.who.int/iris/bitstream/handle/10665/254715/WHO-IVB-17.01-eng.pdf?sequence=1

Sources:

Case uploaded:
2020-10-15

Kimaroroni Solar Home System

Why to choose this solution?

Kimaroroni is a sub village within Kwasadala village. Most of the residents are Masai and few are chagga. Agriculture and livestock keeping are main economic activities. Kimaroroni village is currently not connected to the national grid electricity though demands for electricity exist for lighting, powering basic home appliances and productive economic activities. Solar Home systems (SHS) are among other options installed to address electricity demand at household level. Almost all households around rely on solar power. Most of the SHS at Kimaroroni operates for about three to five hours a day.

Savings per day or production:

Savings of 1.0Lt. of kerosene per day for an ordinary family, which cost Tsh 3,000 per 1.0.Lt.

Cost in money and in own time to construct:

The solar cost TZS. 1,200,000/= The cost covers purchase of Battery, Inventor, Solar Panel, Electric wire ring / installation, lamps accessories etc . For this case, two solar panels one of 100 watts and the small solar panel 20 watts with amplifier are available

Lifetime:

10 -20 years but it depends on use

Maintenance needed:

Ensure safety of solar panel, battery and inventor as well as lightning system-bulbs replacement

Resources needed in use:

Enough Sun light energy

Problems and limits:

Electric short in case of misuse can happen. Unavailability of electric power once sunshine is not available and no battery to conserve energy

Where and how can you get it or make it?

The equipment were purchased from Sundar solar company and installation / fixing was done by an independent technicians. Solar panels and accessories are available all over Tanzania.

Skills needed to produce, install. maintenance, use:

Installation requires skilled person, short training required to be able to do maintenance

How to use it:

https://youtu.be/f-WXQPztdZ0

How to maintain it:

https://youtu.be/Anvgg2SenaE

Climate effect (if any):

Solar is a renewable source of energy and therefore no or negligible CO2 is released from the system.

Why is it successful?

There is enough sun light. Also high demand for electricity especially in rural area where connection is still 24.5%.

If you can make it, a short description, typical problems, materials needed:

This technology requires a qualified technician to install it.

How to make it (if possible):

N/A

How is it delivered and by whom?

There are various solar system promoters/agents available in Tanzania where through them large percentage of the population have been sensitized. A good number of technicians have been trained, private sector has facilitated access to solar panel and associated accessories in many places of the country.

Successful financial model

Once initial cost has been settled, there is no monthly bills/payments for its use.

What policies and strategies helped the success?

National Energy Policy 2015 encourages diversification of energy sources; solar is among, Tax exemption on solar panels.

More info:

http://www.cetosudeorg.wixsite.com/cetosude

Sources:

Kimaroroni village/CETOSUDE

Case uploaded:

2022-03-30

M-Kopa 600 Solar System with TV, Light







Why to choose this solution?

An M-KOPA PV system powers lights, radios, TV, and mobiles using clean, safe, and reliable solar energy. It is a package of the following: one control unit, a 24-inch flat-screen digital TV, one 30-W solar panel, one TV remote control, a TV aerial, two lights with high and low settings, and two phone-charging cables.

Savings per day or production:

M-KOPA customers enjoy many hours of kerosene-free lighting daily.

Cost in money and in own time to construct:

One 24-inch TV with a package of M-KOPA 600 costs KSH 65,499 (USD 655). A customer pays a deposit of KSh 5,49 (USD 55) and daily rate of KSh 100 (USD 1) through M-PESA Pay Bill Number 333222 for a duration of 600 days in order to fully own the product. A 24-inch TV with a package of M-KOPA 600 Zuku costs KSh 85,499 (USD 855). A customer pays a deposit of KSH 7499 (USD 75) and daily rate of KSh 130 (USD 1.3) for a duration of 600 days in order to fully own the product.

Lifetime:

Not specified.

Maintenance needed:

M-Kopa repairs or replaces the product in accordance with the warranty terms and conditions. The warranty is valid only if the product is used as instructed and is not tampered with, opened, modified, or used in other ways not authorized by M-Kopa. If the product is faulty in any way, customers return it to the nearest retail store or qualified dealer for repairs or replacement.

Resources needed in use:

Sunlight.

Problems and limits:

When customers face temporary financial challenges making their daily payments.

Where and how can you get it or make it?

M-Kopa Solar is available through hundreds of dealers in Kenya. To find the nearest dealer, contact customer care on phone or web site. The customer care team is available to support their customers, agents, and retail partners.

Skills needed to produce, install. maintenance, use:

The M-KOPAnet platform has been designed and built from the ground up by a talented team of software engineers. They are used solely in accordance with the instructions provided in the instruction manuals and must be maintained in proper repair and working condition.

How to use it:

https://youtu.be/aZjN62oFwsU

How to maintain it:

To be added.

Climate effect (if any):

Tonnes of CO2 reduced: 1.7M. It also outlines the energy efficiency gains being made in customer homes and businesses.

Why is it successful?

The vendor offers the following: Full warranty (3 years on control unit, bulbs, TV, & solar panel); Full warranty (2 years on phone-charging), cables, M-KOPA custom charges; no collateral needed; customer only needs a National ID and matching mobile money account.

If you can make it, a short description, typical problems, materials needed:

Not relevant, requires a skilled person to make it.

How to make it (if possible):

https://youtu.be/3n8NYQR_AbM (not perfect fil, just for illustration).

How is it delivered and by whom?

Installation of Mkopa 600 is done by Mkopa sales agents/ technical experts. The customers confirm/certify that the products are in good working condition upon installation. If the customer chooses to install the M-KOPA 400 or M-KOPA 400 product on his or her own without the assistance of an M-Kopa certified installer, the customer shall be liable for any negligent handling that leads to the failure of the product to perform as expected.

Successful financial model

Prepaid and pay-as-you-go models, support for development.

What policies and strategies helped the success?

The M-KOPA pay-as-you-go solar model has helped open up new consumer markets. A professional call centre helps with any problems. Upgrades and cash loans available to good payers.

More info:

http://www.m-kopa.com/

Sources:

M-KOPA Chania Avenue, Off ring-road, Kilimani, P. O. Box 51866-00100 Nairobi, Kenya. Tel: +254 707 333 222. Email: info@m-kopa.com.

Case uploaded:

2020-09-15