



solarpanda

2023 Impact Report

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The Solar Panda Story

Access to electricity should be a right for everyone, everywhere.

With recent advancements in solar technology, coupled with the adoption of mobile phones and mobile money, access to affordable, healthy, clean energy is here.

Yet, more than **750 million people worldwide still live without access to electricity**. This impacts the lives of people who are trying to study, work, and play without the benefit of electricity and must suffer the health consequences of toxic kerosene. Solar Panda was started in 2016 with the aim of transforming people's lives through access to electricity.

Solar Panda is on a journey to give every household access to solar energy — to light their home, improve their health, charge their mobile phone and provide a window to the world through radio and TV.

Access to electricity is an investment in people that transforms lives. We thank all those who have believed in our story so far and look forward to our future growth and impact.





Letter from the CEO

I first spent time in Africa in 2005 and gained an appreciation for what an incredible place it is, and for the significant challenges the continent faces. In 2016, after two successful solar energy ventures in Canada, I was at a conference and reminded of the fact that 1 billion people in the world lack access to basic electricity, mostly in Sub Saharan Africa. This was my calling to start Solar Panda to help chip away at this inequity.

Today, Solar Panda is powering over 300,000 homes with off grid solar – an incredible milestone we are all proud of. Recently though, we have been so focused on the commercial side of the business, it’s easy to lose sight of the immense social impact we are having. After several difficult years post-pandemic, we have returned to profitability. We know that a social enterprise’s impact is only sustainable if that company is profitable and around for the long run.

It's refreshing to take stock of our achievements in this inaugural Impact Report. We are intensely committed to both profitability as well as social impact and look forward to making an even bigger impact in 2024.

Andy Keith, Founder & CEO

Who We Are

Solar Innovators

Solar Panda is an innovative company providing solar home systems (SHS) to rural African communities without access to electricity.

Financial Includers

Our loan-to-own model allows millions of families to have electricity for less than the daily cost of kerosene and mobile phone charging.

Environmental Defenders

By harnessing the power of the sun, our customers have a clean, safe and healthy source of electricity.



What We Do

Electrify

Solar Panda develops innovative solar energy systems to electrify homes and small businesses. Each upgradeable kit comes with lights, mobile charging, a radio, lantern and torch, with options for premium appliances like a TV.

Loan-to-Own

Our affordable financing plans save customers money now and for years to come. Once the loan is repaid the customer owns the unit outright and never has to make another payment.

Grow

As our customers' energy needs grow, so do Solar Panda systems. Additional appliances like a TV can be added when the time is right without buying a whole new system.



Energy Access & Quality of Life

Solar Panda’s motto, Boresha Maisha, means “Improving lives.”

Access to electricity has a transformative impact on people's lives. It is a fundamental driver of human development, improving living conditions, healthcare, education, economic opportunities, and overall well-being. It also plays a critical role in advancing sustainability and reducing disparities in access to modern amenities.

Globally, approximately 750 million people do not have access to electricity, 80% of which are in Sub-Saharan Africa. In these poor countries, even for those with access, the service is often unreliable and expensive. Poor countries pay a higher proportion of their income on illumination than wealthy countries.

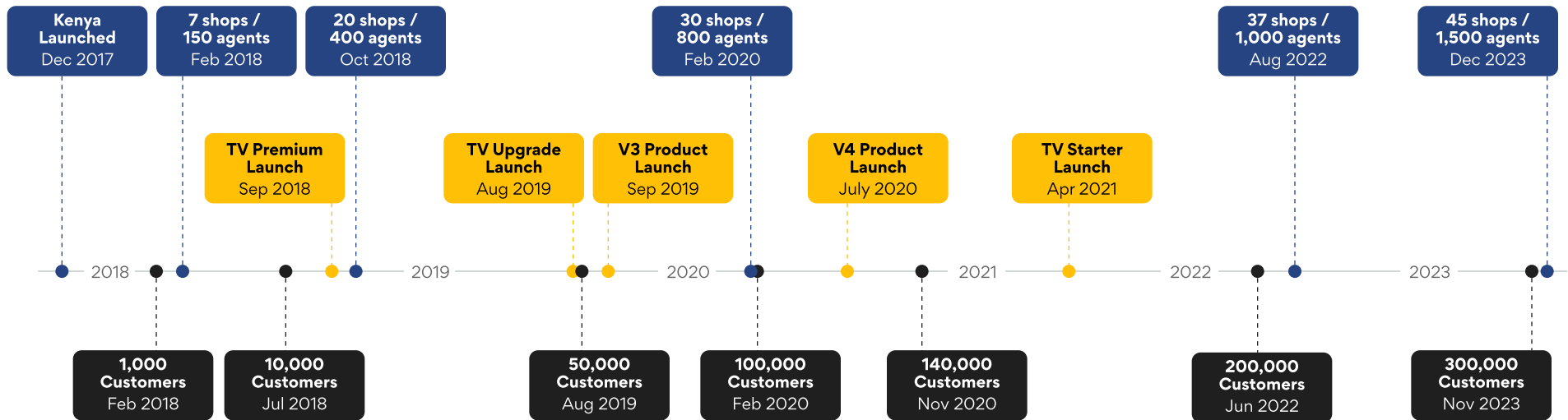
Since starting sales in 2017, Solar Panda has brought electricity to approximately 1,400,000 people in Kenya. We have continuously innovated our products and pricing models and are confident that we have the highest quality and most affordable product of any SHS company in Kenya. Our customers have put their faith in us with one of their biggest investments and we believe they deserve nothing less.

<u>Energy Access</u>	2023 (Jan 1 – Dec 31)	All time (Dec 2017 – Dec 2023)
Number of people with improved energy access	252,350	1,423,020



“ Lights are helpful in running everyday life such as cooking, doing homework with my children. I am also able to charge my phone and listen to news through my radio.
– Samwel Muroki ”

Milestones



“ There is improvement in the quality of life because right now I am able to enjoy meals together with my family making them more enjoyable with lights. Cooking is faster and easier for my wife and even when you drink water, you see exactly how clean the water is because of the proper lighting within the house. ”
 – Gabriel Achanga

Environmental Impact

Sustainability and environmental responsibility are built into Solar Panda's DNA.

Despite contributing the least to the problem, climate change disproportionately impacts developing countries, exacerbating existing socio-economic disparities and environmental vulnerabilities. Rising temperatures, extreme weather events, and shifting rainfall patterns disrupt agricultural systems, reducing food security and increasing the risk of famine. Inadequate access to clean water and sanitation becomes even scarcer as droughts intensify, leading to health crises. Developing nations often lack the resources and infrastructure to cope with these challenges, causing widespread displacement, economic losses, and strained healthcare systems. Climate change, therefore, perpetuates poverty, inequality, and instability, making it crucial to address its impacts on the most vulnerable nations.

As a leader in this sector, Solar Panda feels a great sense of responsibility to combating climate change and sees two main ways in which it can have the greatest impact:

Environmentally supportive products & managing e-waste.

Environmentally Supportive Products

- The displacement of kerosene lamps by our Solar Home Systems has a direct benefit on the environment. Kerosene lanterns are harmful to the environment due to their role in climate change, air pollution, and deforestation, making their use unsustainable from an ecological perspective. When burned, kerosene releases carbon dioxide and other greenhouse gases into the atmosphere, contributing to global warming and climate change. One single kerosene lantern burns the equivalent of nearly 500 pounds of coal per year, or 50 gallons of gasoline.² The open flames in kerosene lanterns also pose a fire hazard, increasing the risk of forest fires and contributing to deforestation.
- Solar Panda has eliminated single-use plastic from its packaging.
- An underappreciated additional aspect of this industry’s environmental impact is that it helps solar become the socially accepted norm; thereby influencing national decisions such as the types of power plants to build or industrial consumers going off-grid.



<u>Kerosene replacement & CO₂e reduction</u>	2023 (Jan 1 - Dec 31)	All time (Dec 2017 - Dec 2023)
Kerosene lanterns replaced	49,764	290,011
CO ₂ e emissions avoided (in metric tons, over lifetime of products)	86,975 Metric Tons CO ₂ eq	451,642 Metric Tons CO ₂ eq

² <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Managing e-waste

Africa has become ground-zero for the growing global e-waste problem due to its role as a dumping ground for discarded electronics from more developed regions. It is estimated that over **60%** of the e-waste in Africa comes from imports. Inadequate regulations and enforcement mechanisms, coupled with limited recycling infrastructure, lead to informal and hazardous recycling practices. Globally, only 17.4% of electronics are properly collected, treated, and recycled as part of an end-of-life process; and in Africa that drops down to only **0.9%**³. Addressing this issue requires both local and international efforts to implement responsible e-waste management practices and promote sustainable recycling solutions.

³ <https://sun-connect.org/repairing-electronics-a-circular-economy-solution-for-reducing-e-waste-and-building-resilience-in-rural-africa/>

Reduce

First, our products are designed to be upgradeable, which reduces waste caused by planned obsolescence.

Reuse

Second, our circular economy program collects abandoned, defective, or damaged e-waste from customers and diverts it to a local refurbishment facility we have built. This facility employs 23 well-trained technicians who transform these obsolete items into second-life devices that are then re-deployed into the field.

Recycle

Finally, when refurbishment is not possible, we use a certified waste management partner (EnviroServe) to maximize the amount of waste that can be recycled.



Despite these strong steps, we are still in the early stages of this journey. While our goal is to collect and refurbish/recycle 100% of the e-waste that is sold to customers, this is extremely difficult to do in a way that is socially, economically, and logistically feasible. In 2023, we have conducted multiple repossession and customer return pilots and will continue to explore new ways to collect or incentivize customers to turn in their end-of-life products. We are also actively seeking partners and international support to achieve this goal – we don't believe any one company alone can solve this problem.

<u>E-waste Management</u>	2023 (Jan 1 – Dec 31)	All time (Dec 2017 – Dec 2023)
E-waste Recycled (in metric tons)	14.1	28.9
Units Refurbished	8,682	12,232

Economic Impact

Through its products and business, Solar Panda is providing economic benefits to hundreds of thousands of Kenyans.

Poverty in Africa is a persistent and complex challenge, affecting millions of people across the continent. Sub-Saharan Africa, in particular, faces high levels of extreme poverty. Poverty not only hampers individual well-being but also hinders broader economic development and social progress.

Solar Panda provides employment to approximately 1,800 Kenyan households through our 295 full-time employees and 1,500 active sales agents, the majority of which are in rural regions where jobs can be harder to find. We hire locals. Of all the company's employees in Kenya, only one is not from Kenya. We value diversity. Our employees come from many different ethnic communities, including marginalized groups in Kenya.



Due to its rural-focused distribution and sales approach, Solar Panda serves a greater proportion of homes below the poverty line in Kenya than the industry average. 57% of Solar Panda customers live on less than US \$3.20/day compared to the SHS industry benchmark of 37%. Our products have a direct, beneficial impact on the economic wellbeing of our customers. Our products displace previously necessary costs of kerosene, phone charging and batteries for radio and torches. These savings can be used for other essentials such as food, education, and health care. Solar Panda’s financing model allows customers to build credit history, enabling future purchases. Many Solar Panda customers also use our products for productive means – charging mobile phones for others, lighting in a shop to allow it to stay open later, using the torch or lantern to fish or farm after the sun goes down.



<u>Economic Activity</u>	2023 (Jan 1 - Dec 31)	All time (Dec 2017 - Dec 2023)
People undertaking more economic activity	15,848	92,924
People using product to support enterprise	5,359	31,357
People that spend more time working	8,957	52,494

<u>Income Generation</u>	2023 (Jan 1 - Dec 31)	All time (Dec 2017 - Dec 2023)
Additional income generated (over lifetime of products)	12,652,792 USD	65,643,781 USD





How to sell products to the poorest people in the world in a sustainable way is a significant challenge for the SHS industry. Solar Panda has iterated on its pricing models over its lifetime to try and achieve low, affordable prices for consumers and to ensure high repayment, which measures how frequently the customer is getting use out of their product.

Energy Spending

2023
(Jan 1 – Dec 31)

All time
(Dec 2017 – Dec 2023)

Savings on energy expenditure per household
(on average, over lifetime of product)

143

USD / household

164

USD / household

Savings on energy expenditure all households
(on average, over lifetime of products)

172,250

USD

718,818

USD

Health & Safety

Kerosene kills, quite literally.

Kerosene lanterns releases harmful pollutants, such as carbon monoxide and particulate matter, which degrade indoor air quality. Prolonged exposure can lead to respiratory problems, eye irritation, and other health issues, especially in poorly ventilated spaces which are common in rural African homes. The WHO estimates that breathing in kerosene fumes is the equivalent of smoking **2 packs of cigarettes a day** and causes **4.3 million premature deaths each year**.⁴ This problem disproportionately affects women and children who spend more time in the homes.

Further, the open flames in kerosene lamps pose a fire hazard, resulting in accidental fires and burn injuries, and they can also be dangerous in homes with young children.

Reliable light (both inside and outside a home or business) improves safety as well. 92% of Solar Panda customers report feeling safer with their solar home system.



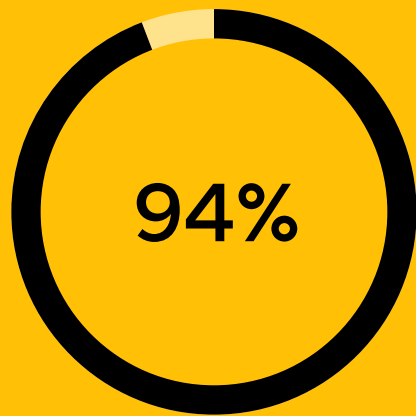
The health benefits of eliminating kerosene:

- Reduced rates of respiratory illness including pneumonia and tuberculosis, a leading cause of death in countries with high kerosene use
- Reduced risk of accidents including accidental ingestion of kerosene by children (the primary cause of child poisoning in sub-Saharan Africa)
- Reduced risk of fire and burns
- Elimination of eye irritation

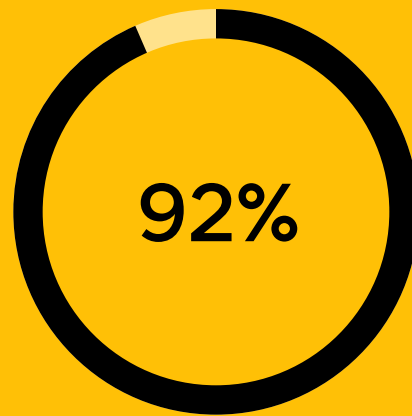
⁴ <https://www.powerwells.org/blog/blog-post-title-three-babra#:~:text=The%20use%20of%20these%20fuels,smoking%2040%20cigarettes%20per%20day>.

Health & Safety Benefits

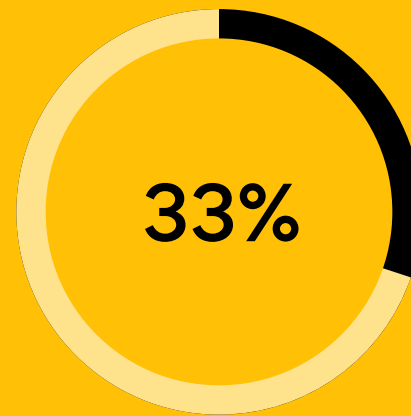
In a survey of Solar Panda customers done at the time of sale and then 6 months later:



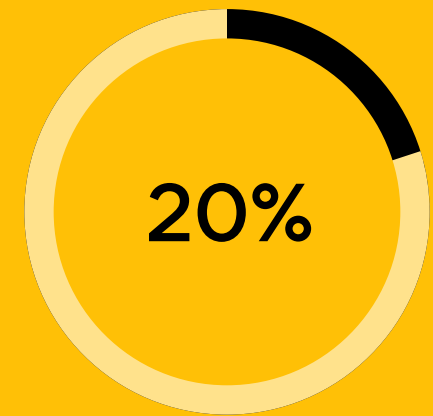
Have stopped using kerosene completely



Report feeling safer with the solar home system



Reported reduced respiratory problems



Reported reduced eye problems

“ Our health is better; no more coughing. During the holidays, my kids enjoy being in a house with good light. – Viphian Belio ”

Education & Information

Education and access to information is critical to breaking the cycle of poverty.

Education, in Africa especially, is of paramount importance because it serves as a catalyst for individual empowerment and broader societal development. Access to quality education equips individuals with the knowledge and skills needed to escape the cycle of poverty, improve their economic prospects, and participate in the global workforce. It also fosters critical thinking, innovation, and problem-solving abilities. Beyond personal benefits, education strengthens healthcare systems, reduces gender disparities, and promotes social cohesion. A well-educated population is essential for addressing the continent's numerous challenges, making investment in education a key driver for Africa's future progress.

Solar Panda's products empower education: a clean source of light allows children to study for longer periods of time at night without eye strain and being subjected to toxic fumes. Radio, TV, and mobile phone charging provide access to the world through news, education, and entertainment, making a more informed and educated citizenry. Solar Panda has also donated systems to Kenyan schools.



“ I now have good lighting for my children to do homework and give the house brightness at night. – Nell Chepkemoi ”

Before 2020, the world had the highest number of children in school ever. During COVID-19, schools closed, and tuition money dried up, forcing over 1.5 billion children home. In developing countries, schools remained closed for a long time and many never re-opened. 10 million children may never return to school,⁵ a devastating legacy of the pandemic.

In 2020, Solar Panda teams from Canada & Kenya discussed the difficulties of their children being home with remote learning. They discussed how there was no learning happening in many Kenyan homes because of lack of computers and internet connections. They had an idea. Could they provide educational content on USB sticks that can play on TVs without internet?

So, the team started a non-profit education program to offer Khan Academy content loaded on USB sticks that you could plug into your TV. This gave children in K-12 free educational content and interactive lessons on topics such as reading skills, math skills, science skills, social studies skills, and life skills.

Khan Academy is one of the world's leading providers of free education content. Through this program, children could access over 1000 hours of educational content, curated by Kenyan teachers in line with the Kenyan school's curriculum. If they didn't have one, families could purchase a pre-loaded USB stick for a fraction of cost. This program was intended to provide a short-term solution to the challenges caused by the pandemic. However, we have found that this additional educational support is still needed now that children have returned to school. To date, 2,695 educational USBs have been provided to Kenyan families. Solar Panda is actively looking for sponsors and funding to expand this program so that more children can access education.



2,695

**Families with free access to
education content**

⁵ <https://www.savethechildren.ca/article/almost-10-million-children-may-never-return-to-school-following-covid-19-lockdown/>

Gender Equality

Solar Panda makes gender equality a primary focus.

Gender inequality remains a significant challenge in Africa (and much of the world), with women & girls facing disparities in much of life. While progress has been made in some areas, many African countries continue to grapple with issues such as limited access to education for girls, gender-based violence, unequal economic opportunities, and inadequate healthcare. Cultural norms and traditional roles often perpetuate these disparities, restricting women's participation in decision-making processes and public life. Achieving gender equality in Africa is crucial not only for the well-being of its women and girls but also for the overall development and prosperity of the continent.

Since inception, Solar Panda has made gender equality a strategic focus, both with employment and our product. We believe it is not only the right thing to do, but it's good business. Many of our most dedicated, passionate, and successful employees are women and 51% of our employees are women at all levels of the organization, including management and technology. Solar Panda also provides fully sponsored management training to female employees.



51%

Percent of female jobs (150)

In 2023, 47% of registered Solar Panda customers are female (up from a historical average of 46%) but consumer insight studies indicate that in many instances where the husband makes the purchase, the wife is actually driving the purchase decision. Therefore, we believe that over 50% of end-users are women. Solar Panda has increasingly been targeting sales to women as we know that eliminating fuel-based lighting is disproportionately beneficial to the health and safety of women and children. We have undertaken training programs for our field agents to teach them how to emphasize the benefits of our products to women and have established relationships with many Chamas. Chamas are micro-saving societies that groups of Kenyans use to pool savings. These groups especially help Kenyan women, who are often financially dependant on men, achieve some financial independence. We have further taken our focus on gender equality into account in the design of the product: while almost all companies have removed the portable lantern from their standard kit offerings, we understand this is the product most important to women and children who must travel or work at night.



47%
Percent of female customers

Our People

At Solar Panda, we've always known what is important to us; we just never wrote it down. In late 2022, we rolled out our Core Values (written by employees) that are meant to guide our actions, every day. 2023 gave us opportunities to bring these core values to life:

While the Kenyan economy has been suffering, we increased our workforce to nearly 1,800 (1,500 Field Agents and 295 full-time employees), providing regular income to more families in rural regions where jobs can be scarce. Our team comes from an array of ages, religions and cultures and more than 50% of employees and 42% of Field Agents are women.

We started an employee education program, providing training on topics such as financial literacy, stress management, leadership and conflict resolution to improve the lives of our team, both professionally and personally.

Kenya is one of the worst countries in the world for traffic-related deaths per capita. Many of our people travel around the country by motorbike and to help keep them safe, we launched a road safety program. We made helmets mandatory and provided them at heavily subsidized prices (agents could use points they earn from sales to redeem). Our training team visited all shops and conducted road safety training for every Field Agent in the company. We've since expanded the safety items we offer - like Valutex safety boots, reflector jackets, and rain gear to help with floods.



Methodology & Acknowledgements

Solar Panda uses an industry-aligned approach to measure our impact.

Methodology

Wherever applicable, impact metrics are calculated using the GOGLA Impact Calculator to ensure a standardized approach with industry norms that is aligned with GOGLA's Standardized Impact Metrics for the Off-Grid Solar Energy Sector and aligned with the IRIS Metrics.



Credibility

Solar Panda partnered with 60 Decibels, a global, leading social impact measurement company, to collect impact data and consumer insights. A baseline phone survey was done of 297 randomized customers immediately after purchasing a Solar Panda system and then a follow-up survey was done with those same customers 6 months later. The insights from this survey were compared against industry benchmarks.

60 dB



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Kifurusi cha TT
Solar Panda

NYAKWAR SENIOR

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SERVED BY SUNLIGHT
Kifurusi cha TT
Solar Panda

BA BAWA