



ELECTRIC BODA BODAS

THE INNOVATIVE
BUSINESS MODEL:
ZEMBO

A PIONEERING AND
SUSTAINABLE AFRICAN
MOBILITY SOLUTION





Zembo (Zero Emission Motorcycle Boda) is a start-up specialising in innovative and sustainable mobility solutions for Africa. Zembo's electric motorcycle and network of solar charging stations have been revolutionising the motorcycle taxi "boda boda" market in Uganda since 2019.

Opportunity for Sustainable Change

Kampala, Uganda has an estimated 200,000 boda bodas and is the 21st most polluted capital city in the world.



Electric motors are non-polluting and 3-4 times more efficient than fuel motors.

Motorcycle taxis, known locally as boda bodas, are widely used in Kampala and other cities in East Africa.

Due to their affordable service and ability to manoeuvre through dense traffic, as well as limited public transport infrastructure, boda bodas are the main form of transportation for many people in the region. However, they are also a leading cause of noise and air pollution and the lifespan of many motorcycles on the road has expired.

The boda boda market offers a high impact opportunity for clean energy companies and public authorities to introduce sustainable mobility solutions that dramatically reduce fine particles and greenhouse gas emissions, improve health, create job opportunities for young people, and stimulate green economic growth.



Motorcycle taxis are a main form of transport in many large cities in Africa.



Real-time monitoring of each charger and battery in the charging cabinet.

Innovative Mobility Solution

Zembo is creating a new market for e-mobility in Kampala by selling electric motorcycles on a lease-to-own model and building a network of solar charging stations.

The Zembo Storm motorcycle is low cost to operate and durable enough for Uganda's roads. The bike parts are sourced from China but assembled in Kampala. This has improved local technical skills and ensures high quality on-site maintenance and repairs. The motorcycles are lowering both fine particles and CO₂ emissions, as well as noise pollution, across the city.



Zembo Storm is powered by a lithium battery and can travel 60 km on a single charge.

Feedback from the drivers has considerably improved our product and operations. Maintaining a good reputation in the market is critical for our future growth.

Titus Kimbowa, Business Team Lead, Zembo



Drivers lease the motorcycles with a payment period of two years to reach full ownership. Affordable weekly fees, free maintenance services, and battery recharging rates lower than regular fuel costs are significantly increasing the drivers' revenue and demonstrating the value of the product.

Important factors in Zembo's success are a customer-focused strategy and responsive agility in pricing and product development.

Although e-motorcycles are well-established in many parts of Asia, they are still a new product in Africa. A flexible and proactive approach, based on close monitoring of use and open feedback from its drivers, has enabled Zembo to adapt its business to meet the needs of the local market and lay a strong foundation for scaling up.

No oil, no fume: when I'm stuck in the traffic with all the black fumes, I think that everybody should go electric.

< Ivan Kasule, boda boda driver

Zembo's commitment and responsiveness to its drivers have created strong customer loyalty and proven to be the best marketing tool. The Zembo Storm attracts high interest each time one is on the road and the drivers receive a referral commission that speeds up their path to ownership.



Zembo is also building the infrastructure that is needed to make e-mobility a viable transport alternative in Africa.

During its first year of operations, Zembo established a network of 7 solar-recharging stations that operate on a PAYG battery swap model. Batteries can only be recharged at Zembo stations and each motorcycle has a GPS tracker to enable Zembo to monitor its performance and switch off the bike in the case of non-payment or theft.

The network of recharging stations means that drivers avoid the risk of purchasing an expensive battery and always have a place to quickly swap their depleted battery against a recharged one. The stations also offer job opportunities and experience with solar battery technology for youth.

When I started using my Zembo Bike, just in three weeks I was able to save up to one million shillings. I'm happy my income has now increased.

< Ssenyonjo John Bosco, boda boda driver

Under its EEP Africa-financed pilot initiative, Zembo plans to put over 200 electric motorcycles on the road and open 15 recharging stations in Kampala.



Within five years, Zembo aims to have a network of 700 stations across Uganda and be present in 5 countries in East Africa.



Uganda is one of the largest importers of motorcycles in East Africa (USD 55 million per year).

Future Market Potential

With millions of motorcycle taxis active in Sub-Saharan Africa, the market potential for electric boda bodas is enormous. The sector is on the verge of exponential growth as public authorities recognise the critical role e-mobility plays in climate resilience and as companies validate the game-changing impact of PAYG on productive use equipment.

The battery-as-a-service model decouples investment and usage, enabling more people to make the transition to e-mobility.

Étienne Saint-Sernin, Zembo co-founder

Zembo is currently selling its own brand of motorcycles to help create the market, but the company sees the greatest potential for future growth in the batteries and charging stations. As the global market moves towards e-mobility, more vehicles will be converted to electric motors and Zembo is encouraging companies to produce models that are compatible with Zembo batteries.

LESSONS LEARNED :

Market entry for a new technology can be difficult. To introduce the electric motorcycle concept in Kampala, Zembo targeted drivers working for SafeBoda, a local ride-hailing app with an existing database of drivers and a reputation for safety and reliability.



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Boda boda drivers are the best promoters of e-bikes. Zembo offers its drivers a commission for client referrals.

By focusing on a PAYG battery-as-a-service model, Zembo reduces the investment cost and risk of the user while optimising battery quality, lifetime, second life and recycling. The battery swap services also reduce opportunity costs (no waiting time during charging) and provide flexible infrastructure for power generation and energy storage capacity.

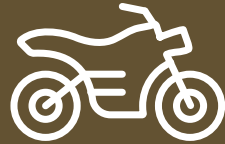
LESSONS LEARNED:

The Zembo Storm initially had a 2kW motor, similar to e-bikes used in China, but this proved insufficient for the Ugandan market. Zembo worked with its drivers to assess actual usage and local needs, then retrofitted all the motorcycles with a 3kW motor at no charge to the users.

Development Impact



Zembo was selected to participate in the 2019 MAN Impact Accelerator, a joint initiative by MAN Truck & Bus and Yunus Social Business to support start-ups with impactful innovations in the fields of mobility, transport and logistics. From a pool of 300 projects in 40 countries, Zembo was one of only 8 start-ups chosen to participate, and one of just two picked from Africa.



The Bike

Powerful, reliable, comfortable



The Battery

High capacity, lithium technology, safe and long lifetime



All Green

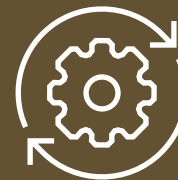
Recharged in solar station - no CO₂, no particles, no pollution, no noise



Drivers earn more revenue due to low battery recharging costs and motorcycle repayment fees.



Zero particle emissions, zero noise pollution, and reliable equipment that reduces accidents.



Job creation, especially for youth, as drivers, station attendants, maintenance and repairs.



Zero GHG emissions and clean energy storage capacity that can be extended to other users.



Zembo motorcycles are assembled in Kampala, offering technical training and jobs for local youth.



Public-Private Partnerships

After Uganda signed the Paris Agreement, the Kampala Capital City Authorities (KCCA) launched a Climate Change Action Strategy with six focus areas, one of which is “sustainable mobility solutions.” With funding from the European Union, KCCA is implementing a sustainable urban development program to promote clean energy for transport and reduce pollution and emissions in the city.

Clean transport is one of the major interventions we can take to reduce pollution. It's easy to work with Zembo because they have tested the technology and understand the local market.

Edison Masereka, Business Development Manager, KCCA

Zembo has established positive relations with the KCCA and is one of the first private companies involved in this program. In 2020, KCCA procured four Zembo motorcycles and funded one charging station (10 kW solar PV) to lead by example in the transition to green

The KCCA has a Green Agenda with a vision to make Kampala a “Vibrant, Attractive and Sustainable City”.

technology. The station is owned by the city but operated by Zembo. It is staffed by young people from a KCCA-affiliated youth group, who will gain skills and experience in solar batteries and electric motors.



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The Zembo Storm was showcased for energy experts, donors and government officials at the EEP Africa 2019 Knowledge Exchange Forum in Tanzania.

At the national and regional level, Zembo is working with other players in the sector to encourage policy changes that will stimulate the growth of e-mobility. This includes efforts to reduce import tariffs and other taxes, ensure new regulations in the sector expand opportunities for responsible companies, and leverage public and private investments for infrastructure development.

LESSONS LEARNED :

When it became clear the initial price exceeded market value, due to insufficient infrastructure, Zembo decreased the battery swap fees and agreed with its drivers to increase them marginally with each new charging station that opens. The final price will remain cheaper than fuel.

Progressive Management

In addition to revolutionizing the mobility sector, Zembo is also introducing a progressive management style to Uganda. Many companies have a hierarchical structure that limits innovation, and this can be negatively reinforced in companies with a combination of international and local staff. The French and German co-founders of Zembo both had extensive experience working in Africa and were determined to develop a management culture that emphasizes equality, efficiency and individual initiative.

Zembo operates as a Teal organization based on the principle of self-management. All aspects of the business (including financial management) are fully transparent and each employee has their own role. Staff members consult with each other but there is no boss; each person is the decision-maker in their particular area of work and cannot be overruled, even by the company founders. The goal of this is to demonstrate trust and empower all members of staff to be responsible managers.



A Teal organization is based on two key words: trust and responsibility.



Zembo's core initial team: Sarah, Daniel, Étienne, Moreen and Bakka.

Zembo has allowed me to do a bigger job than just accounting. I am helping make the rules and exploring all aspects of the business.

Moreen Naakigudde, Administration and Finance Manager, Zembo

Impact of Covid-19

In response to the Covid-19 crisis, Uganda closed its borders and prohibited all non-essential movement within Kampala for several months in 2020.

Boda bodas were authorised to operate for deliveries but forbidden from transporting passengers, which is a higher source of revenue. Zembo was determined to support its clients during this difficult period. In addition to halting all lease payments, the company provided each driver with a small cash advance and looked for other opportunities to boost income, such as investing in drivers' side businesses.

Zembo also supported its employees during the lockdown in Uganda. The main office and several of the recharging stations were forced to close, but Zembo continued to pay the salaries of all staff. Team members were provided with internet access and communication tools to work remotely. In the stations that remained open, Zembo provided masks, sanitizers and health training to ensure employee safety.

Another impact of the crisis was in sourcing. The shipment of a container with 65 motorcycles and 200 batteries was delayed first in China and then due to border restrictions between Kenya (the port of entry) and Uganda. Zembo's decision to assemble and repair the motorcycles locally, however, meant that equipment already in the country remained operational throughout the pandemic.

Despite these challenges, Zembo remains confident about the future. Boda bodas are a basic service in African society and market demand remained even during the crisis. The fact that e-mobility is cheaper than fuel is a strong argument in its favour during an economic downturn. The health crisis also gives more credibility to low-carbon strategies that help mitigate the larger crisis represented by climate change.



Zembo has found that its drivers are the most enthusiastic and natural promoters of e-mobility. The company began offering drivers a commission for client referrals. This has reduced marketing costs, increased the drivers' ability to pay off their lease more quickly, and catalysed the spread of e-transport in the city.

E-mobility in the EEP Africa 2020 Call for Proposals

Many governments and donors in Africa are making sustainable transport a priority for research and advocacy, but there is limited funding available for private sector-led projects in the sector. As an early stage clean energy financing facility, EEP Africa has seen the demand for funds to pilot and demonstrate e-mobility solutions grow rapidly in recent years.

In 2020 EEP Africa opened a call for proposals on Clean Energy Powering Green Growth, with particular focus on productive use of energy and clean energy in circular economy solutions. The call attracted more than 350 applications and, compared to past calls, demonstrated a strong increase in the number and diversity of e-mobility projects.

The e-mobility proposals focused on clean energy solutions for a wide variety of electric vehicles: 2-wheelers like boda bodas, 3-wheeled delivery bicycles, 4-wheeled taxis



and minibuses, 4x4 off-road vehicles (for game reserves or humanitarian response), and fishing boats on Lake Victoria.

Some projects focused simply on replacing diesel and gas with electric motors, but many went beyond this to propose innovations in battery recycling, solar-powered charging stations, connections to local mini-grids, and integration with cold storage technology and agricultural value chains.

EEP Africa will continue to work with its portfolio companies, investment and knowledge partners, and government stakeholders to advance the development of sustainable and innovative mobility solutions across East and Southern Africa.

E-mobility projects proposed in EEP Africa's 2020 call came from Kenya, Malawi, Namibia, Rwanda, Tanzania and Uganda.





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We need to act on the areas that are increasing emission levels. We are all affected and we can be part of the solution by changing our daily behaviours on resource use and waste disposal, our choice of transport and building practices, our waste and energy consumption patterns.

Lord Mayor of Kampala, Erias Lukwago (August 2020)

Acknowledgements

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