



**UGANDA
ELECTRIC
MOBILITY
ASSOCIATION**



Uganda Electric Mobility Association **POSITION PAPER**

**STEERING THE E-MOBILITY
TRANSITION IN UGANDA**

October 2024

Foreword

I am proud to present this paper that aimed at the advancement of electric mobility in Uganda. At Power Africa, we are committed to driving Africa's energy transformation, and our support for the development of this paper reflects our belief that sustainable, clean energy solutions are key to unlocking economic growth and addressing urgent challenges such as climate change and energy access.

In recent years, the global shift towards sustainable transportation has gained unprecedented momentum, and Uganda stands at a critical juncture in this movement. As the country confronts the pressing issues of air pollution, climate change, and the high cost of fuel, the transition to electric mobility has emerged as a powerful solution—and an opportunity to foster transformative change across both urban and rural landscapes.

Power Africa's support for this paper is rooted in our recognition of the potential electric mobility holds to reshape Uganda's transport sector. By embracing cleaner, more sustainable technologies, Uganda can not only address environmental concerns but also improve public health, reduce fossil fuel dependency, and stimulate economic growth. However, the journey towards e-mobility is not without challenges. Significant barriers—ranging from infrastructure gaps to policy and regulatory constraints—must be overcome.

That is why this paper is so important. It highlights both the hurdles Uganda faces in its transition to electric mobility and the solutions that can accelerate progress. Our goal in supporting this report is to provide insights that guide stakeholders to come together and drive the change needed to create a thriving e-mobility ecosystem in Uganda.

A crucial part of this journey was the establishment of the Uganda Electric Mobility Association (UEMA). Power Africa recognizes the pivotal role UEMA can play in galvanizing the private sector, fostering collaboration, and driving innovation in the e-mobility space. By providing a unified voice for industry stakeholders, UEMA will be instrumental in advocating for supportive policies, developing infrastructure, and raising public awareness. Its role in overcoming the barriers to electric mobility and spearheading the adoption of cleaner transport technologies is essential.

At Power Africa, we believe that the transition to electric mobility is not just about adopting new vehicle technologies; it is about envisioning a future where clean, electric transport drives economic development, enhances public health, and safeguards our environment for generations to come. This paper lays the foundation for that vision, but more importantly, it underscores the importance of collective action from government, private sector actors, development partners, and civil society.

As we delve into the insights presented here, let us embrace this vision of a cleaner, more sustainable Uganda—empowered by electric mobility and made possible by the collaborative efforts of stakeholders across the board, including the invaluable role of UEMA. Power Africa is proud to support this journey, and we stand ready to continue working with our partners to bring this vision to life.

Together, we can move forward towards a brighter, cleaner future for Uganda.



Richard Nelson
Power Africa Coordinator

About UEMA

The Uganda Electric Mobility Association (UEMA) was founded in March 2023 and fully registered in April 2024. UEMA's vision is to transform Uganda into a leading hub for e-mobility solutions by fostering collaboration and innovation among players within the sector.

Vision

To transform Uganda into a leading hub for e-mobility solutions by fostering collaboration and innovation among players within the sector.

Mission

To streamline the actions and targets of e-mobility players in Uganda and align their efforts with the support required from different stakeholders.

Objectives

1. Advocating for policies that support the adoption and growth of e-mobility technologies and infrastructure in Uganda, including electric two-wheelers, three-wheelers, four-wheelers, charging infrastructure, and battery swapping systems.
2. Lobbying for government incentives and funding to support the development and deployment of e-mobility solutions, such as tax incentives, grants, and subsidies.
3. Raising awareness about the benefits of e-mobility and promoting public education and outreach programs to encourage adoption of these technologies.
4. Working with industry stakeholders, including automakers, technology companies, and utilities, to promote collaboration and partnerships to accelerate the growth and adoption of e-mobility.
5. Building partnerships with other organizations and stakeholders, such as environmental groups and community organizations, to build a broad coalition in support of e-mobility.
6. Advocating for research and development of new e-mobility technologies and promoting innovation in the industry.
7. Provide access to information (the coalition should be up to date with policies and should inform the other stakeholders)
8. Capacity building for members to promote and enforce safety, compliance and self regulation.

Acknowledgments

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The successful completion of this report was made possible by the active involvement and generous contributions of a diverse range of stakeholders, including members of UEMA, government agencies, and leading development organizations. UEMA members dedicated significant time and effort, providing critical insights into the private sector's role in Uganda's e-mobility landscape. Their input, based on firsthand experience in driving the industry forward, helped assess the current state of e-mobility for businesses and operators across the country.

Government institutions played a crucial role in the report's development by offering an in-depth understanding of the e-mobility ecosystem and sharing details on the various policy tools and frameworks being utilized to support this evolving sector. These discussions highlighted ongoing regulatory efforts and strategic initiatives aimed at fostering the growth of electric mobility in Uganda.

In addition, the contributions of key development organizations such as the World Bank, UNEP, UNDP, GIZ, USAID Power Africa, and the African Development Bank (AfDB) were instrumental in providing a broader perspective on the development of e-mobility in Uganda. These organizations shared valuable insights on their ongoing efforts to promote sustainable transportation solutions, offering both a global and regional context to the progress of e-mobility in Uganda. Their involvement further enriched the report by reflecting the critical support needed by international partners in advancing clean energy solutions for the country's transportation sector.

UEMA extends its sincere appreciation to Mr. Tom Courtright for his leadership in the development of this report. We also wish to thank Ms. Sawuya Nakijoba for her support and all UEMA members for their feedback, and all other key contributors for their invaluable roles in the report's development and review.

Executive Summary

The Uganda Electric Mobility Association (UEMA) was established to lead the transition towards sustainable electric mobility in Uganda. This position paper, developed with support from Power Africa, presents an in-depth analysis of the current state of e-mobility in Uganda, its benefits, challenges, and a roadmap for future growth. The paper advocates for the adoption of e-mobility solutions as a critical step in reducing the nation's reliance on fossil fuels, improving air quality, and fostering economic growth through the creation of a modern automotive industry.

E-mobility in Uganda is still in its early stages, with over 3,000 electric motorcycles but less than 100 each of electric cars and buses. The sector is dominated by electric two-wheelers, driven by cost advantages and a growing network of battery swap stations. While Uganda has begun implementing fiscal incentives and introduced the National E-Mobility Strategy, there are gaps in policy stability and clarity, particularly in terms of import duties and VAT exemptions. A stable, supportive regulatory environment is crucial to attract investment and spur sector growth.

The adoption of e-mobility can significantly reduce Uganda's fuel imports, cutting forex losses and increasing demand for locally-produced, clean electricity. The industry has the potential to create high-quality jobs and boost local manufacturing. Electric vehicles can also reduce local air pollutants by up to 100% and lower carbon emissions by over 90%, contributing to Uganda's climate goals and improving public health.

Major barriers include insufficient charging infrastructure, lack of consumer awareness, and inadequate investment. Additionally, inconsistencies in fiscal policies have hindered the growth of the sector, particularly for electric cars and buses. Our key recommendations to boost the e-mobility sector are as follows:

- The government should reintroduce and stabilize fiscal incentives for electric vehicles with a clear timeline for the availability of these incentives, focusing on import duty exemptions for electric cars and buses, and VAT exemptions for locally assembled electric motorcycles.
- Investment in charging and battery swap stations must be prioritized to support the growth of electric vehicles. A strategic plan for national EV charging infrastructure is needed, with a focus on key urban centers and major transportation routes.
- The government should lead by example through the procurement of electric vehicles for its fleet, targeting a 25% transition to EVs in the government fleet by 2030 and 100% by 2040.
- Encouraging public-private partnerships and investment in the e-mobility sector will accelerate growth, particularly in areas such as financing, local manufacturing, and skills development.
- A national awareness campaign is essential to address misconceptions and encourage the adoption of electric vehicles, alongside developing vocational training programs to build a skilled workforce for the sector.

The UEMA Sector Position Paper provides a comprehensive blueprint for advancing electric mobility in Uganda. By addressing regulatory, financial, and infrastructural challenges, and fostering collaboration among stakeholders, Uganda can become a regional leader in e-mobility, achieving significant economic, environmental, and social benefits. The paper calls for collective action from the government, private sector, and development partners to drive this transformative shift.

Acronyms

2W	Two-wheeler
3W	Three-wheeler
AfEMA	Africa E-Mobility Alliance
EAC	East African Community
ERA	Electricity Regulatory Authority
EV	Electric vehicle
GHEA	Greenhub East Africa
GKMA	Greater Kampala Metropolitan Area
ICE	Internal combustion engine
KMC	Kiira Motors Corporation
SoC	State of Charge
SoH	State of Health
STI	Secretariat of Science, Technology and Innovation
UEMA	Uganda Electric Mobility Association
UEDCL	Uganda Electricity Distribution Corporation Limited
UEGCL	Uganda Electricity Generation Corporation Limited
UETCL	Uganda Electricity Transmission Corporation Limited

Table of Contents

Foreword.....	i
About UEMA	ii
Acknowledgments.....	iii
Executive Summary.....	iv
Acronyms.....	v
1. Introduction	1
2. The State of E-Mobility in Uganda	2
2.1 Background	2
2.2 Key Stakeholders.....	2
2.3 State of the Market.....	7
2.4 Consumer Preferences	10
2.5 Investment	10
3. Current E-Mobility Policy and Strategy in Uganda.....	11
3.1 Fiscal Policy	11
3.2 National E-Mobility Strategy	11
3.3 Draft Policies.....	12
4. Contribution of the E-Mobility Sector to Uganda's Economy	13
4.1 Reduced Forex Losses.....	13
4.2 Increased Consumption of Electricity.....	13
4.3 Reduced Local Air Pollutants.....	13
4.4 Reduced Carbon Emissions.....	14
4.5 Creation of Modern Industry	14
4.6 Improving Security.....	14
4.7 Savings for Consumers.....	15
5. Barriers and Policy Options	16
5.1 Fiscal Policies	16
5.2 Non-Fiscal Policies	19
5.3 Non-Policy Options	22
6. Advocacy Plan	25
6.1 Key messages.....	25

1. Introduction

E-mobility in Uganda is a nascent industry that has significant promise but requires a stronger enabling ecosystem to fulfill its potential. E-mobility holds significant promise for Uganda's economic growth in the form of a new, modern industry and making Uganda more energy secure. It will also help Uganda meet its environmental and public health goals by reducing greenhouse gas emissions and local air pollutants. However, the e-mobility ecosystem remains under-developed, with e-motorcycles leading the way and other sectors under-developed.

This report aims to provide an actionable set of recommendations to boost the e-mobility sector. Starting off with a description of the current state of the industry and e-mobility policy in Uganda, this report then spells out the benefits of e-mobility to Uganda. We then dive into the barriers still facing the sector with a set of actions to present to the appropriate authorities. With the support of all stakeholders, we hope this document can be used to accelerate the transition to e-mobility in Uganda.

2. The State of E-Mobility in Uganda

2.1 Background

E-mobility in Uganda is shaped by government regulations, local and international initiatives, consumer preferences, and investment funding. The overall state of the market is clearly improving, as witnessed by the early adopters who have seen improvements in technology and service availability, as e-mobility companies upgrade batteries and vehicles and grow their maintenance networks, vehicle financiers provide leasing schemes, and government fiscal incentives have lowered total costs.¹ Critically, since July 2023 the government has provided fiscal incentives for the e-mobility industry, which have helped to lower costs for companies and consumers alike. However, most of this progress is limited to the e-motorcycle industry, which now numbers over 3,000 motorcycles on the road, compared to less than 30 electric buses and only 83 electric passenger cars.

Technical challenges such as short-circuiting throttles or faulty batteries have lessened as companies have matured and local capacity has been built up. Service challenges around availability of battery swapping stations and a limited number and range of trained EV technicians are also slowly being overcome. However, there are only an estimated 125 battery swap stations and 4 public charging stations, compared to over 3,132 public petrol stations, and maintenance of EV parts can only be done by a limited number of technicians so there remains a long way to go to match ICE service availability.²

2.2 Key Stakeholders

2.2.1 Public Sector Stakeholders

Ministry of Works and Transport (MoWT)	MoWT is mandated to formulate policies, plans, set standards, build capacity, carry out advocacy, regulate, monitor and evaluate the Works and Transport sector, inclusive of roads, vehicles, and more. MoWT is responsible for inspection of all ICE and electric vehicles in the country, and can set policies - including notably government procurement - that influence the adoption of EVs in Uganda.
Ministry of Energy and Mineral Development (MEMD)	MEMD is mandated to establish energy policy, plan for electricity generation infrastructure, and manage mineral resources. MEMD is working with the World Bank on an e-mobility diagnostic that will also address the issue of new electricity demand and is expected to be completed by Q1 2025.

¹ Focus group discussions.

² <https://www.monitor.co.ug/uganda/business/commodities/57-of-fuel-stations-don-t-meet-standards-report-says--4166526>

Most vehicle repair shops are informal and no accurate estimates could be found on their numbers, but experts in the industry estimate they are more numerous than petrol stations.

Ministry of Finance, Planning, and Economic Development (MoFPED)	MOFPED is mandated to formulate economic and fiscal policies, guide the evolution of the Ugandan economy, and develop the central government's budget. The latter includes fiscal policies that shape the e-mobility sector – such as the removal of certain taxes or granting of corporate tax breaks - which are then passed by Parliament.
Secretariat for Science, Technology, and Innovation (STI)	STI is under the Office of the President, and is mandated to lead the development of the e-mobility strategy and policy to guide the e-mobility ecosystem. STI published the National E-Mobility Strategy in June 2024, and acts as a coordinating body, keeping up to date information on the sector.
Electricity Regulatory Authority (ERA)	ERA is mandated to set electricity tariffs, including the creation of novel new tariffs, and to regulate the electricity sector more generally.
Umeme	Umeme is the leading license holder for the distribution and sale of electricity in Uganda, connecting over 95% of grid-connected customers. ³ Umeme is responsible for infrastructure from the substation to the end consumer, including transformers. Umeme's concession, however, ends on March 30th, 2025, and all assets and operations will be handed over to UEDCL. ⁴
Uganda National Bureau of Standards (UNBS)	UNBS is mandated to establish and review standards, including for the e-mobility sector in Uganda. UNBS collaborates with international organizations including the International Electrotechnical Commission (IEC) and International Standards Organization (ISO) to review, adopt, or adapt international standards for the Ugandan context.

2.2.2 Development and International Organizations

World Bank	The World Bank is currently working with the financial support of the Quality Infrastructure Investment Partnership (QII) with the Government of Japan and through the World Bank's Energy Sector Management Assistance Program (ESMAP) to conduct a Diagnostic Study on E-Mobility Market Development in Uganda. The study, which is due to be completed in December 2024, is assessing the state of e-mobility in Uganda and developing a roadmap for the government to provide an enabling environment, with an energy sector perspective.
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3 "Poor Power Network Worries Electricity Company," Daily Monitor, March 28, 2016. <http://www.monitor.co.ug/News/National/Poor-power-network-worries-electricity-company/-/688334/3136024/-/12957kd/-/index.html>

4 "UEDCL READY TO TAKE OVER FIFTH POWER CONCESSION," UEDCL, September 28, 2024. <https://www.uedcl.co.ug/uedcl-ready-to-take-over-fifth-power-concession/>

Gesellschaft für Internationale Zusammenarbeit (GIZ)	GIZ has worked on several e-mobility projects in Uganda on skilling, awareness, and business models. They are on a taskforce with MEMD, ERA, and UNBS on establishing standards. GIZ also provided funding for Zembo's off-grid swap station corridor to Masaka. Most critically, through the Promotion of Renewable Energy and Energy Efficiency Programme (PREEEP) and Employment and Skills for Development in Africa (E4D) programme and commissioned by BMZ, has partnered with GOGO Electric to create the Development of Relevant and Innovative Vocational Skills in E-mobility (DRIVE) project. The DRIVE 1.0 project resulted in the development of three curricula and training manuals and trained 104 Ugandans in managerial positions, technicians, and operators. DRIVE 2.0 is taking a gender-transformative approach and aims to address gender disparities and improve inclusivity in the sector, and is working at the Renewable Energy Training Center (RETC) at Nakawa Vocational Training Institute.⁵ GIZ has also recently begun a project assessing the business case for electric two- and three-wheelers in the regional cities of Gulu and Mbarara with a focus on opportunities for women, one of the only studies assessing the potential for e-mobility outside the capital city.
United Nations Environment Programme (UNEP)	UNEP has supported e-mobility initiatives in Uganda since at least 2020, including e-motorcycle pilots and a host of gender & e-mobility-related projects. Through the Clean Air Initiative, UNEP provided 50 e-motorcycles to the International University of East Africa in 2021.⁶ Additionally, through SOLUTIONSplus and in collaboration with Women on Wheels and Zembo, UNEP funded the training of 25 women to become e-boda boda riders in mid 2023. Most recently, with funding from the BMZ and in collaboration with the Africa E-Mobility Alliance, UNEP published the first of its six country reports with a baseline report on Uganda on E-Mobility as a Driver for Change: Towards a Gender Transformative and Just Transition to Electric Mobility. The next step involves a pilot program to improve women's participation in and leadership of the e-mobility sector in Uganda.
African Development Bank (AfDB)	AfDB has the Green Mobility Facility for Africa (GMFA), which is currently raising around \$300 million to accelerate private sector investments in e-mobility and other sustainable transport solutions in Africa.

⁵ "DRIVE Project: GOGO Electric and GIZ upskill 104 Ugandans in e-mobility." Accessed: <https://gogo.co.com/drive-1-0/>

⁶ "IUEA launches e-mobility pilot programme with electric motorcycles, car," Nile Post, March 17, 2021. <https://nile-post.co.ug/news/99850/iuea-launches-e-mobility-pilot-programme-with-electric-motorcycles-car>

European Union (EU)	The EU, through the Electrifi Country Window for Uganda, has made a \$1.6 million investment in GOGO Electric, their first investment in e-mobility.⁷ The EU has also funded KCCA's first e-motorcycle battery swap station through the Partnership for Inclusive Urban Development (PIFUD) program. The swap station, which is in partnership with Zembo network, also serves as a pilot for employing youth through KCCA's youth employment programs.⁸
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2.2.3 Private Sector Stakeholders

Private sector e-mobility stakeholders in Uganda consist of two broad groups: e-mobility companies, who are involved in retail, maintenance, or operations of electric vehicles; and e-mobility ecosystem companies, who provide financing, own or provide access to fleets, or otherwise support the e-mobility players.⁹

Name	Primary business	Description
Karaa	E-mobility company (bicycles)	Karaa is a Ugandan e-bicycle company that was founded in 2022. Karaa distributes and installs e-bicycle conversion kits, and has retailed or converted around 100 e-bicycles in Uganda by August 2024.
eBee	E-mobility company (bicycles)	eBee is a Dutch e-bicycle company that entered the Ugandan market in 2023. eBee provides e-bicycles for sale, lease, or rental, in particular targeting the delivery market through partnerships with Glovo and others. eBee has deployed over 105 bicycles in Uganda and is also operational in Kenya and Rwanda.
AfricroozE Uganda Ltd	E-mobility company (bicycles)	AfricroozE is an e-bicycle company founded by FABIO, a local bicycle NGO, and Africrooze GmbH in 2024. AfricroozE provides e-bicycles for lease, rental or sale and has distributed over 300 e-bicycles in Uganda.
Reliefline / Harakka	E-mobility company (bicycles)	Harakka, previously named Reliefline, is an e-bicycle company that has been operating for over two years in Uganda. Harakka retails e-bicycles and has sold over 60 e-bicycles.

5 "Electrifi Invests in Ugandan E-Mobility Pioneer GOGO Electric, Accelerating Green Transportation and Job Creation," Electrifi, May 16, 2024. <https://www.electrifi.eu/news/electrifi-invests-in-ugandan-e-mobility-pioneer-gogo-electric-accelerating-green-transportation-and-job-creation/>

6 "KCCA LAUNCHES ELECTRIC MOTORBIKE CHARGING STATION," KCCA, February 15, 2024. <https://www.kcca.go.ug/news/804/>

9 Details received from interviews with companies and company websites.

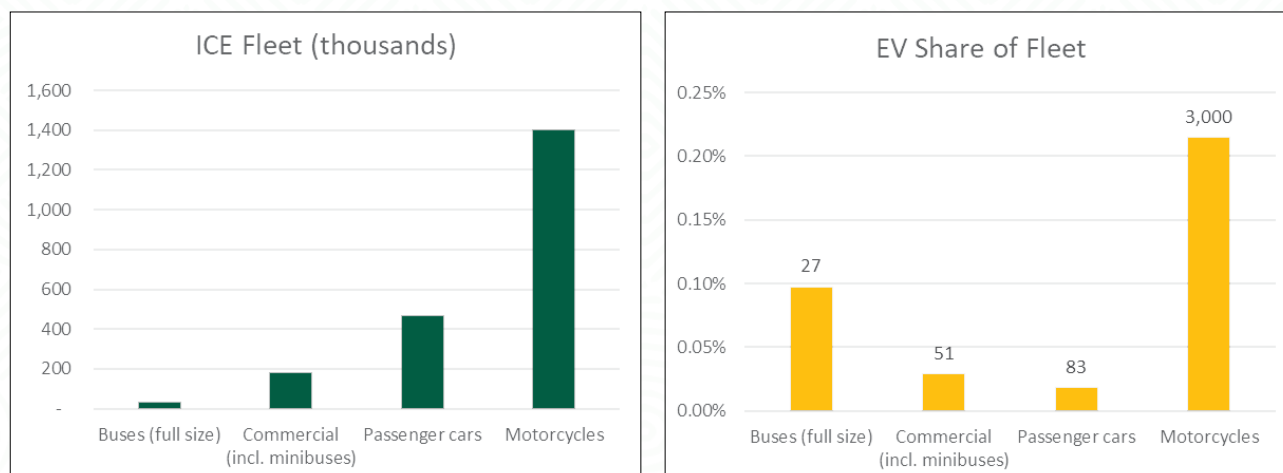
Zembo	E-mobility company (motorcycles)	Zembo was founded in 2018 to tackle the <i>boda boda</i> market in Uganda. Piloting the battery swap station early on, Zembo has over 700 motorcycles on the roads and 29 battery swap stations in Kampala and reaching Masaka.
Gogo / Bodawerk	E-mobility company (motorcycles)	Bodawerk was founded in 2017 and initially focused on innovative applications of lithium-ion battery technology. Bodawerk has over 1,800 e-motorcycles and 66 swap stations across the Central Region, and has additional operations in Western Kenya.
Spiro	E-mobility company (motorcycles)	Spiro was founded as a short-term merger of M-Auto and Arise II, raising over \$120 million within two years. Spiro has deployed over 500 e-motorcycles in Uganda along with 32 swap stations located in the GKMA, Mbarara, and Jinja. Spiro is also operational in Kenya, Rwanda, Togo, Benin, and Nigeria.
Redvers E-Mobility	E-mobility company (motorcycles)	Redvers was founded in 2018 in Kira Municipality, in the suburbs of Kampala. Redvers has around 50 retrofitted motorcycles on the road and has a battery swap station in Kyaliwajjala.
Green Hub East Africa	E-mobility company (motorcycles)	Green Hub East Africa (GHEA) was founded as a joint venture of Motorcare and Nexus Green in 2023, focused on e-two-wheelers. GHEA has deployed at least 25 TVS iQube e-scooters in Kampala along with 6 public charging stations for electric 2- and 3-wheelers.
Modjo Energies	E-mobility company (motorcycles)	Modjo Energies is a Ugandan e-motorcycle company founded in 2022. Modjo Energies focuses on ICE motorcycle conversions, and has deployed around 10 e-motorcycles in Uganda.
Kiira Motors Corporation	E-mobility company (buses and cars)	Kiira Motors started in 2007 as a research project creating the first African-designed e-bus. Kiira has since raised significant funds from the Ugandan government and aims to be an e-bus builder based out of Jinja. KMC has produced 27 e-buses and sold them to clients including the Civil Aviation Authority and Uganda Airlines.
FreedomEV	E-mobility company (minibuses)	FreedomEV was founded in 2024, importing Dongfeng brand e-minibuses. One of the youngest companies in Uganda's e-mobility ecosystem, FreedomEV is currently the only company targeting Uganda's 100,000+ minibus-taxis.

Motorcare	E-mobility company (cars)	Motorcare was founded in 1992 and is the official distributor of Nissan vehicles in Uganda. Motorcare has sold around 32 electric cars in Uganda and 28 e-scooters.
The Motor Center	E-mobility company (cars)	The Motor Centre East Africa was founded in 2005 and has distributorship agreements with KIA Kinglong, SONALIKA, and MG Over the past two years it has sold around 17 fully electric passenger cars and 3 hybrids.
Soleil Power	Supply Chain (batteries)	Soleil was founded in 2022 to build East Africa's first commercial scale lithium-ion battery assembly plant serving the region's EV and ESS markets. From 2025 Soleil plans to supply over 20,000 EV batteries annually to the market.
Altec / EV World	Ecosystem (charging)	Altec was founded in 2022 as an EV charging infrastructure provider. Altec has installed two charging stations, one at Arena Mall and the other at Amber House, MEMD's headquarters.
Total Energies	Ecosystem (charging)	Total is a French multinational oil and gas company which has expanded into offering EV charging services at its petrol service stations in Europe. In Uganda, Total has one charger for its own fleet and is planning on opening three more by the end of 2024.
Watu	Ecosystem (financing)	Watu is a UK-based asset financing company that has been operating in Uganda since 2020. Watu finances motorcycles, phones, and more. Watu has a significant investment in Bodawerk and provides financing for their e-motorcycles.
Mogo	Ecosystem (financing)	Mogo is a Latvian financing company that has been operating in Uganda since 2021. Mogo currently finances e-motorcycles from Zembo and Spiro and e-bicycles from eBee.
Asaak	Ecosystem (financing)	Asaak is a U.S.-registered financing company that finances motorcycles in Uganda. Asaak has piloted financing Spiro e-motorcycles.

2.3 State of the Market

While nascent and unequal, e-mobility in Uganda is starting to experience rapid growth, led in particular by electric motorcycles. As of August 2024, e-motorcycles number around 3,000 in Uganda, an estimated tripling over the past year. E-buses and e-cars remain few in number, with

less than 100 e-cars and around 27 e-buses.¹⁰ However, it's important to note that according to Ministry of Works and Transport classifications, minibuses are regularly included in the commercial vehicles category.¹¹ Additionally, "other" vehicles were left out of this analysis as they consist of a wide mixture of vehicles such as forklifts, tractors, ambulances etc, which together were less than 28,000 vehicles (1.3% of the registered fleet) as of September 2024.



Electric vehicles - including e-bicycles, e-motorcycles, e-three-wheelers, e-cars, and e-buses - are primarily a technological replacement of international combustion engine (ICE) vehicles (except for e-bicycles), and their market is therefore primarily defined by the current ICE market.¹² By this regard, EVs remain few and far between, under 0.5% of the total fleet, but likely around 2% of monthly sales thanks to the strong traction of e-motorcycle players.¹³

2.3.1 E-Bicycles

Electric bicycles in Uganda are electrifying the oldest form of wheeled passenger transportation in Uganda. With over 9 million bicycles in Uganda and an estimated immediate market of around 90,000, companies like eBee, Karaa, and AfricroozE are either retrofitting motors on bicycles or importing and assembling new e-bicycles. A mixture of business models are being used, including selling retrofitting kits, selling bicycles wholesale, leasing bicycles. Electric bicycles can be recharged at home, or batteries can be swapped on the road, as eBee does during work hours for its lease-to-own customers using delivery apps.

While there is room for growth, the lack of bicycle friendly infrastructure and the upfront cost of e-bicycles remain challenges for the subsector. Additionally, consumer preferences tend to devalue bicycles, with preference shown for motorcycle-style vehicles and a lack of understanding on the capability of an e-bicycle.

2.3.2 E-Motorcycles

Electric motorcycles are the leading EV sub-sector in Uganda, with over 3,000 e-motorcycles on the road. Electric motorcycles represent a low-hanging fruit for vehicle electrification in Uganda,

¹⁰ Elsewhere, Kiira Motors Corporation reports producing 39 e-buses with 34 currently in the fleet.

¹¹ Interview with the Ministry of Works and Transport.

¹² Note that the "Other" category includes forklifts, which have been the fastest segment to electrify - but aren't traditionally considered vehicles outside of Ministry of Works and Transport statistics.

¹³ Interviews with e-motorcycle financiers revealed around 300 sales a month of around 13,000 average monthly total motorcycle sales in Uganda, as of July 2024.

as their costs are relatively close to ICE equivalents, are easily locally assembled, and are primarily used for commercial purposes which reduces their payback period.

Much of the success of the e-motorcycle sub-sector in Uganda is a result of the battery swap model, which nearly all of the e-motorcycles in Uganda use. Pioneered internationally by Gogoro in Taiwan a decade ago, the battery swap business model splits ownership of the motorcycle and battery, with the battery owned by the battery swap company in perpetuity. This has the following advantages:

- **Makes e-motorcycles competitive** with ICE motorcycles by reducing the upfront cost of the motorcycle by as much as 50%. The battery can cost 40-50% of the total cost of an electric motorcycle.
- **Improves battery longevity** by keeping batteries tracked and maintained by battery swap companies for optimal lifespans.
- **Reduces range anxiety** by allowing motorcycle riders to swap depleted batteries for full batteries an unlimited number of times a day, extending their range.
- **Improves security** by requiring the driver to return to battery swap stations to continue driving. Were a stolen motorcycle to be taken to a battery swap station, the thief would be apprehended.
- **Reduces fraud rates** by ensuring that drivers must return to stations to swap batteries, so that they cannot simply remove GPS trackers and drive off.

However, there are also motorcycles on offer which can be charged at home or at public charging stations. These offer the advantage of battery ownership and ability to charge anywhere (and therefore go outside of the current range of swap stations). Additionally, home-charged vehicles lower operational costs significantly, as the operators pay the regular electricity tariff rather than the cost of a swap which includes battery depreciation and station-related costs. They are more commonly found owned by personal motorcycle users and corporate fleets.

2.3.3 Passenger Cars

The electric passenger car market in Uganda is heavily underdeveloped, with Motorcare the only current provider of fully electric vehicles in the country and a handful of electric cars directly imported by residents. There are only 83 registered fully electric cars in the country, less than 0.02% of the country's fleet, and nearly half have been sold by Motorcare. While electric cars benefited from exemption from 25% import duty in the 2023/24 financial year, this was reintroduced after June 30, 2024 and importers report paying the additional 25% import duty.

The infrastructure for electric cars is also underdeveloped, and as of September 2024, there were only three public charging stations in the country. Altec / EV World has built one at Arena Mall and one at the Ministry of Energy and Mineral Development, while City Oil has also deployed one at their location near Acacia Mall.¹⁴

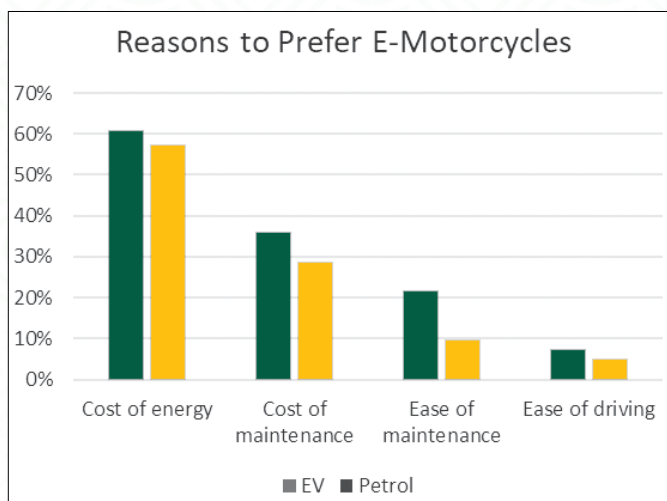
¹⁴ Interviews with EV World.

2.3.4 Buses

There are currently two providers of buses in Uganda: Kiira Motors, which assembles full-size buses at the Jinja Industrial and Business Park, and FreedomEV, which imports fully built electric mini buses. Charging infrastructure for electric buses is all developed and deployed by these two companies in exclusive charging environments. Kiira Motors is currently leasing buses as well as providing e-buses for hiring services.¹⁵

2.4 Consumer Preferences

Demand for e-mobility by Ugandan users is driven first and foremost by cost concerns. Perceived and real savings from lower energy and maintenance costs have so far been the major driver of consumer uptake. While there haven't been surveys on car or bus operator understanding and preferences in regards to electric vehicles in Uganda to date, Lubyanza's Quarterly Report assessed the demands of *boda boda* riders, the leading EV consumer group in Uganda.¹⁶ Both current electric and ICE motorcycle users cited the costs of energy and of maintenance as key reasons for preferring electric motorcycles.



The ease of maintenance and of driving are additional drivers for e-motorcycle uptake.

Electric car users in Uganda have been a mix of local enthusiasts, corporations, and development agencies. Some, such as GIZ, have a mandate to reduce their emissions and to promote e-mobility. Others, like MTN Corporation, are interested in learning about the technology and seeing if it can reduce fleet costs. Comparatively high-end consumers like the aforementioned, however, will likely only spur demand during the initial stages of growth, and there is a need to expand beyond them to reach the main passenger car and bus consumer segments, who have much more utilitarian and cost-driven demands.

2.5 Investment

Investment in e-mobility in Uganda remains woefully inadequate. While total investments in e-mobility in Uganda are estimated at around \$140 million, around 70% of this has been raised by a single company and public information is not available on the majority of this funding.¹⁷ However, conversations with companies and an assessment of the ICE market reveal that this is a fraction of what is needed to electrify Uganda's fleet.

¹⁵ Interview with Allan Muhumuza, August 19, 2024.

¹⁶ "Lubyanza | Tom Courtright," <https://www.tomcourtright.com/lubyanza>

¹⁷ An estimate based on raises by companies based entirely or headquartered in Uganda with internationally operating companies is assumed to be evenly split across all active countries.

3. Current E-Mobility Policy and Strategy in Uganda

E-mobility policy in Uganda currently consists of strategies, fiscal policies, and non-fiscal policies, with the annual Finance Acts and the National E-Mobility Strategy identified as the most important documents.

3.1 Fiscal Policy

3.1.1 Import Duty Exemptions

While the Finance Act of 2023/24 exempted most electric vehicles from paying import duty (typically 25%), the Finance Act of 2024/25 allowed most of these exemptions to expire and provided only import duty exemptions on lithium-ion batteries and electric vehicle parts. While, the Finance Act of 2024/25 includes a special import duty rate of 10% for completely-knocked down motorcycles, it does not clarify whether this is to apply to all motorcycles, and there is currently no HS code at the EAC level for CKD e-motorcycles - meaning effectively, CKD e-motorcycles have not been able to access this rate, despite providing local value addition through manufacturing of parts and assembly of e-motorcycles.

3.1.2 Value Added Tax (VAT)

The Finance Act of 2024/25 provides for VAT exemption on “locally manufactured electric vehicles.” While “locally manufactured” is not defined concretely in terms of local value addition or any other measures, interviews with e-mobility companies and STI reveal that it includes e-motorcycles that are locally assembled, being imported as either CKD or parts.

3.1.3 Stamp Duty Exemption

The Finance Act 2024/25 exempts electric vehicle and accessories manufacturers from paying stamp duty on legal instruments. The definition of a manufacturer to receive stamp duty exemptions however is:

- Minimum capital investment of \$10 million for foreigners or \$300,000 for Ugandans
- Utilizing at least 80% locally produced raw materials (where available)
- Workforce at least 80% Ugandan citizens, earning aggregate 80% of the total wage bill

3.2 National E-Mobility Strategy

The National E-Mobility Strategy was published by STI in June 2024 and is a fairly comprehensive document covering the current landscape, a strategy framework, priority areas, financing requirements, and implementation arrangements. While the Strategy is not legally binding, it calls for the following:

- 0% Import Duty, 0% VAT and 0% Withholding Tax on original equipment manufacturer vehicle parts, components (production parts), EV chargers, EV batteries, and other materials for electric vehicle production.

- An e-Mobility energy tariff for public and commercial charging points like the tariff for city streetlights.
- Exemption of electric vehicles from paying road tolls or street parking fees
- Increasing VAT, import duty, and environmental levy for ICE vehicles.

3.3 Draft Policies

There are two other key policies which are currently in draft:

- The Ministry of Energy and Mineral Development is currently working on a Charging Station Master Plan.
- The Energy Regulatory Authority drafted the Electricity (Electric Vehicle Charging Infrastructure) Guidelines, or EV Charging Guidelines for short, to address the issue of charging infrastructure. The document received public feedback in May 2024 and it has not yet been issued.

4. Contribution of the E-Mobility Sector to Uganda's Economy

4.1 Reduced Forex Losses

In 2023, Uganda had a trade imbalance of around \$5.15 billion, of which around \$2 billion annually is spent on importing fuel - almost entirely for ICE vehicles.¹⁸ In the long term, this trade imbalance can create debt, hurt the domestic economy, and result in currency depreciation.

In 2024 alone, the deployed e-motorcycles are expected to reduce petrol consumption in Uganda by just over 3 million liters, or around \$3.9 million.¹⁹ At scale, e-mobility **could further reduce Uganda's trade imbalance and reduce demand for foreign currency, easing pressure on the Ugandan economy.**

4.2 Increased Consumption of Electricity

After a long period of electricity shortages, there is now a shortfall in demand for electricity in Uganda, and 7% of electricity is exported.

Electric vehicles promise to expand consumption of clean and locally-generated electricity considerably. Uganda has had relatively stable electricity for the past ten years as supply has more than doubled to 2,048 MW peak capacity. Unlike petrol, electricity is locally produced, and is up to 99% clean. This would support demand for locally generated electricity, supporting the power sector financially and enabling the further build out of electricity infrastructure to homes and businesses. Rough calculations show that converting the entire fleet of motorcycles, passenger cars, and buses could result in 6,784 GWh of annual demand - which would be 110% of the total electricity generated in 2023 in Uganda.

4.3 Reduced Local Air Pollutants

ICE vehicles produce a range of harmful air pollutants, including particulate matter (PM10 and PM2.5), nitrous oxides (NOx), carbon monoxide (CO), and sulfur dioxide (SO2).

"The air we breathe becomes good [when we use electric motorcycles]."

Ssemwogerere, e-motorcycle user

Electric motorcycles in Uganda essentially eliminate most pollutants, reducing CO, PM2.5, and NOx by 96-100%, and SOx by 32%.²⁰ This benefits all Ugandans, but particularly benefits typically lower-income pedestrians, *boda* passengers and riders, and all those who work in exposed urban air.

¹⁸ World Bank Data.

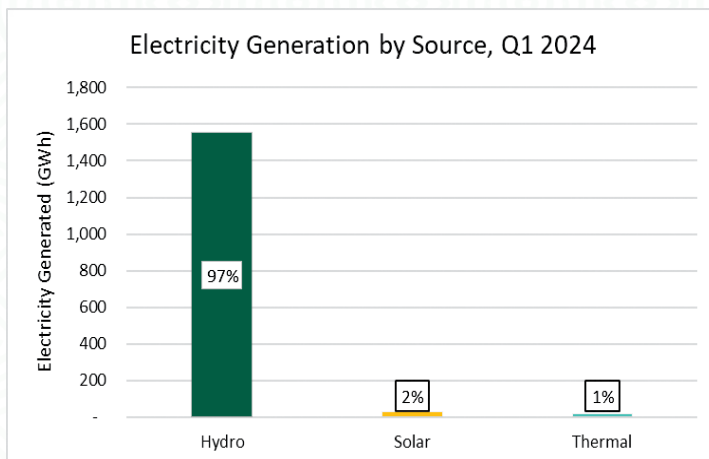
¹⁹ Using the mid-year value of 3,000 e-motorcycles on the road, 3.1 liters consumption per day (from Lubyanza Quarterly Report), 6.5 days a week, .

²⁰ ESIA

4.4 Reduced Carbon Emissions

ICE vehicles in Uganda are responsible for around 7.1 MtCO₂e annually.²¹

Electric vehicles produce no tank-to-wheel emissions as a result of using electric motors, and in Uganda EVs produce around 91% lower lifetime emissions than ICE vehicles as a result of a more than 97% clean grid.²² This is a significant opportunity to help Uganda meet its NDC goals of reducing GHG emissions by 24.7% in 2030 compared to a baseline scenario.



4.5 Creation of Modern Industry

ICE cars and buses are currently all imported fully assembled into Uganda, providing none of the benefits from local value addition.

The EV industry represents a significant opportunity to create a modern industry with value addition in Uganda. Electric motorcycle assembly in Uganda is already going above and beyond the parts required for CKD ICE motorcycles, providing additional benefits. The potential creation of an electric car and bus assembly industry would create local jobs, upskill local talent, and help build a modern automotive industry in Uganda.

4.6 Improving Security

The current transportation system is beset by security challenges, with motorcycle theft a rampant issue. Around 5,000 motorcycles are stolen annually in Uganda, with only around half recovered in 2022.²³ Motorcycle theft in Uganda is also often violent, with dozens of murders associated with motorcycle theft reported every year.²⁴

“Where I stay, I park outside but one time thieves came to steal but they found out that its an electric bike and left it. They instead took a [ICE] Boxer which even had a chain [securing] it.”

Babirye, e-motorcycle user

21 2022 estimate of 2024 baseline emissions. https://unfccc.int/sites/default/files/NDC/2022-09/Updated%20NDC%20_Uganda_2022%20Final.pdf

22 The remaining emissions come from the minimal thermal generation on the Ugandan grid and the energy-intensive production of the battery in China. ESIA

23 “Uganda police break up Kampala motorcycle theft gang,” New Vision April 21, 2023. https://www.newvision.co.ug/category/news/uganda-police-breaks-up-kampala-motorcycle-th-NV_158715

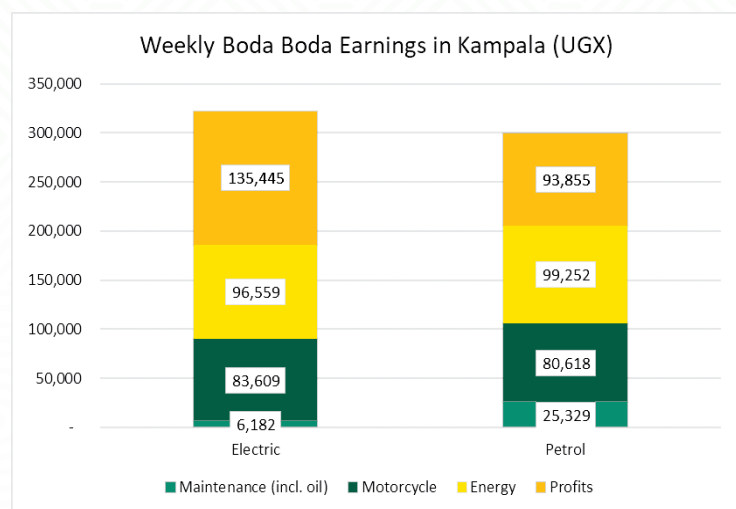
24 “Fear as new wave of boda boda theft, murders hits Busoga,” NilePost, August 7, 2024. <https://nilepost.co.ug/crime/210712/fear-as-new-wave-of-boda-boda-theft-murders-hits-busoga>

There is an opportunity to reduce theft and fraud as electric vehicles require tagged check ins at swap stations and charging stations - meaning unauthorized users can be recognized and apprehended. Vehicle financiers report already seeing lower theft and fraud rates, and focus group participants noted thieves being deterred by electric motorcycles.

4.7 Savings for Consumers

Currently, operators and owners in Uganda spend significant sums on petrol and maintenance for rapidly aging vehicles. For commercial *boda bodas*, *matatus*, and buses, these costs are passed off to passengers, and as a result transportation costs can take between 22% to 50% of residents' budgets in Kampala.²⁵

Electricity is significantly cheaper than petrol and electric vehicles are simpler machines requiring less maintenance than ICE vehicles, saving customers money. As Fig. X indicates, while vehicle motor efficiencies vary significantly and battery swap users must also cover the costs of battery amortization, users can save anywhere from 20% to 70% on energy costs and 50% to 75% on maintenance costs.²⁶ These savings can help owners, operators, and passengers save money.



²⁵ Unpublished WRI Survey, 2021.

²⁶ However, it is worth noting that maintenance costs for e-motorcycles are expected to rise slightly, as the market is currently dominated by new e-motorcycles with active warranties.

5. Barriers and Policy Options

5.1 Fiscal Policies

5.1.1 Stable Tax Exemptions

There is a need to create **stable** fiscal incentives that appropriately **target vehicle types**, with **realistic timelines** for incentivizing local manufacturing and **clear phase-out plans**.

Medium Term (1-3 years)

There is a need for **stable fiscal incentives** offered by the Government of Uganda in order to reduce the cost of vehicles in a price sensitive market and encourage the growth of the industry. Over the past two financial years fiscal benefits have fluctuated significantly for electric vehicles. The Government of Uganda has provided fiscal incentives in the form of first import duty exemptions and most recently VAT exemptions on locally manufactured electric vehicles. The change in the fiscal environment has been disruptive for local e-mobility companies and consumers, whose lead times for ordering electric vehicles and receiving them in Uganda can range from one to six months. People who ordered electric passenger cars in April - June 2024, for example, when there was no import duty on imported cars, have had to then pay 25% more than expected upon arrival.²⁷ Companies like Motorcare that have spearheaded the introduction of fully electric passenger cars have had to adjust expectations. And car charging infrastructure providers have reduced their planned deployment as a result of this policy instability. However, the government should be heartened by the fact that the VAT exemptions on locally produced e-motorcycles immediately saw prices drop among all three major e-motorcycle providers in Uganda.

The government should consider **immediately reintroducing fiscal benefits for imported electric cars and buses**. Fiscal tools are also often targeted at nurturing local industry by providing incentives only for disassembled vehicles (CKD kits) or parts, as the Finance Act of 2024/25 is targeted to do by only providing VAT exemption for electric cars and buses that have been locally manufactured.

“High taxes have increased the price so much. The Government must do something to encourage users to buy. When it’s expensive, they won’t buy.”

Musinguzi, e-car user

While it is admirable and certainly a long-term goal for Uganda to join the small group of African countries with an automotive industry, there are currently no electric cars on the market in Uganda which are locally manufactured and would qualify for this exemption. Considering the required capital investments, there are not expected to be any electric car manufacturers in Uganda for at least a few years. There is also only a single local e-bus manufacturer, and it has as of yet produced about 27 e-buses. There is therefore a need to provide fiscal benefits for imported electric cars and buses.

There is therefore a need to have **realistic timelines for the development of an indigenous automotive industry**. The government should therefore consider providing some incentives for imported CBU electric cars and buses, perhaps at 10% instead of 25%, and complete duty

²⁷ Interview with Hanif; Motorcare

exemption for locally manufactured electric cars and buses. The motorcycle industry in Uganda is significantly more advanced in this respect, and already has both CKD imports and more advanced local manufacturing.

Critically, this stability should therefore be matched by **clear phase-out plans of fiscal incentives**. This phase-out plan can be either planned on the basis of years or of number of vehicles receiving certain benefits. The former would be fairly straightforward - the Ministry of Finance, Planning and Economic Development can pass a policy that establishes that tax exemptions will be in place for the next three or five years. It could also set mid-term tax rates exemptions to reduce the shock of tax reintroduction - for example, exempting VAT entirely for locally manufactured e-motorcycles for the next three years, with VAT then set at 9% (instead of 18%) for two years, and then returned to 18% after that. This would allow companies to gain the scale and set up operations to the point they can pay full taxes and continue to grow.

The downside of this approach, however, is that the government does not know exactly how many vehicles would be imported over the course of these exemptions and therefore the potential cost to the government. Therefore, the alternative approach is to set a fiscal benefit phase-out according to the number of vehicles sold (or imported, depending on the tax instrument used). This would mean for example that the Ugandan government could establish that VAT exemptions would be available for the first 100,000 e-motorcycles sold in the country.²⁸ This would improve the ability of the government to understand the fiscal impact associated with this program of benefits, and would likely be a more accurate reflection of the state of the industry and the industry's needs for benefits, as costs tend to decrease with scale.

5.1.2 Public Procurement

Utilize public procurement to boost demand for EVs

Medium to Long Term (3-10 years)

Currently, **electric passenger vehicle retailers in Uganda report low demand**, while consumers report a limited range of choices. Much of this is due to the comparatively high cost of electric vehicles, which are imported new in comparison to used ICE vehicles used by most of the car-driving population.

A key tool to create local demand for electric vehicles is to **set short-term and medium-term goals** for the government fleet to transition to electric vehicles through public procurement. EV procurement planning should include requirements around supplier registration, to ensure sustainable growth of local industry and avoid opportunistic tenderpreneurs. This would provide a significant boost for electric cars in particular, a heavily under-developed segment. The government in Uganda is believed to own around vehicles and this would therefore be a significant boost.

Public procurement should **focus on 1) low-hanging fruits, and 2) highly visible vehicles**. The former refers to highly affordable, small format, primarily urban, and intensively used vehicles - most notably motorcycles, but also other urban vehicles that regularly travel more than 40 km a day. The latter would be vehicles that are very public facing with a high profile, such as vehicles

²⁸ A similar approach was taken in India, where the FAME 2 program included incentives for 1 million electric motorcycles

in fleets for high-ranking politicians. This would ensure procurement is tackling both the practical (rapid electrification) and the symbolic (unofficial endorsement).

This strategy of public procurement would also help solve the chicken-or-egg situation currently faced by EV charging infrastructure providers, discussed in more detail in the section on building out charging infrastructure.

5.1.3 Li-On Cell Import Incentives

Clarify import duties to ensure Li-On **cells** receive applicable support.

Short Term (6 months - 1 year)

After the reintroduction of import duty on certain electric vehicles and parts, the **status of duties on lithium-ion cells was left somewhat vague**. The EAC gazette which announced changes to import duty rates included somewhat inconsistent language, stating that electric accumulators (batteries) of HS code 8507 would be charged at 35%, excluding 8507.60.00 (lithium-ion batteries).²⁹ HS code 8507.60.00 does not distinguish between batteries designed for electric vehicles and for other purposes, which is partly due to the fact that EV batteries can indeed be easily used for other purposes.³⁰ Importantly, it also does not distinguish between lithium-ion cells and fully-assembled batteries, and companies have reported receiving significantly different treatment when importing Li-On cells for local battery assembly. Some have had them registered as automotive parts, while others have paid the tax or had them even registered as other tax-exempted products on the advice of the Uganda Revenue Authority.

In order to clear this confusion, four specific actions should take place.

- 1) The Uganda Revenue Authority should publish a memorandum clarifying that both Li-On cells and fully assembled batteries are tax-exempted (as per our reading of the EAC Gazette).
- 2) The Uganda Revenue Authority should provide a letter for all members of the Uganda E-Mobility Association to present to customs authorities to ensure equal treatment.³¹
- 3) Uganda's delegation should support the EAC to establish distinct HS codes for Li-On cells specifically, in order to eventually provide targeted fiscal incentives that would encourage the growth of a battery assembly industry in Uganda (as has already started with players like GOGO Electric and Soleil Power).
- 4) Investigate the possibility of providing an expedited path to Authorized Economic Operator (AEO) status for e-mobility companies and value chain actors such as battery or BMS suppliers in Uganda.

²⁹ EAC Gazette, June 30, 2024.

³⁰ Some EV companies in Uganda are already adapting their used EV batteries for stationary backup power, a positive example of second-life applications of EV batteries.

³¹ USEA provided a similar letter for solar PV companies in Uganda importing batteries for their installations.

5.1.4 EV Electricity Tariff

Conduct a feasibility study of **an EV tariff with TOU prices** to reduce electricity costs.

Medium Term (1-3 years)

Electricity is one of the most significant costs for electric vehicle users and EV companies. Reducing the cost of electricity can therefore have a positive impact on users' finances as well as spur adoption of EVs. However, there is a need to realistically assess the impact of such an EV tariff.

The ERA has previously set specific electricity tariffs to encourage consumption by certain user types. E-mobility is a strategic goal of the Ugandan government, and therefore qualifies for special benefits. Additionally, unlike some other special tariffs, e-mobility is already showing growth and this would only serve to accelerate growth and distribute benefits. ERA should **conduct a thorough assessment** of the need and feasibility to set up a special tariff and reduce costs for EV users. This would include assessing the load profile of EVs, including battery swappers, car charging, and bus charging; the potential for load-shifting across these different segments; the expected load growth; and their eligibility for currently existing tariff levels.

5.2 Non-Fiscal Policies

5.2.1 Charging and Swapping Regulations

Finalize and publish charging and swapping regulations to provide clear guidance on charging and swapping station deployment.

Short Term (6 months - 1 year)

EV charging stations currently have no clear regulations regarding the reselling of electricity, and no guidelines on the deployment of EV charging stations and necessary data. While the National Building (Standards for Electrical Installations in Buildings) Code, 2019 sets technical requirements for electrical installations, there is nothing specifically around installing EV chargers or charging EV batteries. Without guidelines on charging stations set up, subpar station setups with **poor accessibility or low safety standards could hamper the public perception of EVs** and willingness to adopt.

There is also a need to ensure that the guidelines **integrate the battery swap infrastructure** that is currently the backbone of electric mobility in Uganda. The draft ERA guidelines define charging stations in a manner exclusive of battery swap stations, yet there are around 125 battery swap stations in Uganda compared to just 4 charging stations for cars and buses - and swap stations continue to grow at a much faster rate. The ERA guidelines should be thoroughly updated with the idea that at the least these two technologies are on par. A review of the guidelines with this view would include, for example, clarifying whether the vehicle-to-grid regulations are inclusive of battery swap stations, amongst several other pending issues.

5.2.2 Establish EV Quality Standards

Establish mandatory standards in order to provide quality assurances.

Medium Term (1-3 years)

There are **currently no standards - voluntary or mandatory - guiding the electric vehicle market** in Uganda. This can allow for the importation of substandard products with a short lifetime or unsafe features, dampening enthusiasm and undermining trust in the sector.

There is therefore a need to have a **comprehensive set of standards** covering charging and swapping stations, EV battery technologies, as well as electric vehicle design itself. For a standard to be established, UNBS first requires a formal request for a standard, which can be instigated by either an internal needs assessment or any external - including private sector - actor. The requestor can also include suggested international or modified standards for UNBS to use in the working draft, which is taken to the technical committee.

UNBS has already begun drafting some standards - this work should be accelerated in order to reduce the amount of time the industry is without standards.³²

5.2.3 Stabilize the Power Grid

Improve the power grid to reduce outages on charging and swapping networks.

Long Term (3-10 years)

Over the past two decades Uganda has made enormous strides extending access to electricity and providing a medium-term solution in the form of solar home systems and small solar lighting products. However, access to grid electricity - which is required for most electric vehicle deployments - remains low, at around 19% as of 2019, and **there is a clear bottleneck at the transmission and distribution stages**.³³ Outages also remain common, and technical faults and failures often cause disruptions which can be a major inconvenience for EV users. This also remains a major concern for users, who in focus groups called on the government to expand access to electricity throughout the country.

In order to do so, the Ministry of Energy and Mineral Development should first **finish the ongoing E-Mobility Diagnostic** (funded by QII and ESMAP and the World Bank) in order to establish a plan for electricity generation expansion in Uganda. Additionally, the impending return of Umeme's assets to the UEDCL has raised questions about service going forward.

Efforts to upgrade transmission and distribution are highlighted in Uganda's Energy Transition Plan (ETP) which calls for around \$2.1 billion to be spent annually on upgrading transmission and distribution until 2035.³⁴ The government should prioritize grid upgrades for charging infrastructure. This includes Umeme / UEDCL harmonizing conductor sizing, pole structures and sizing to fit the

³² Interview with UNBS, September 2024.

³³ "Powering Uganda: the quest for universal electricity access and sustainability," Energy Transition, January 11, 2024. <https://energytransition.org/2024/01/powering-uganda-the-quest-for-universal-electricity-access-and-sustainability/>

³⁴ "Uganda Energy Transition Plan," International Energy Agency, December 2023. Accessed: <https://iea.blob.core.windows.net/assets/f07d075d-de48-4967-a8c8-4806c7247eb7/UgandaEnergyTransitionPlan.pdf>

technical guidelines needed for medium- and high-voltage networks. This should be pursued in order to provide for the full suite of electricity demands by the population of Uganda.

5.2.4 EV Curricula

Establish EV curricula for vocational institutions to bridge the skills gap.

Medium Term (1-3 years)

Currently, **training programs on electric vehicles are extremely limited**, and most tertiary institutions provide no trainings on e-mobility. Most training of EV workers comes from the e-mobility companies themselves. The DRIVE 1.0 and 2.0 programs by GIZ and Bodawerk are a notable example of efforts to develop e-mobility curricula for Uganda and share it with tertiary and vocational institutes.³⁵

E-mobility companies in Uganda report hiring primarily from electrical and mechanical engineering programs at vocational institutes and requiring around six months to a year of on-the-job experience and targeted training programs at work to bring technicians up to speed on electric vehicle needs. To tackle this, **TVET institutions should integrate EV curricula to ensure graduates** are equipped for the e-mobility market.

5.2.5 Battery EOL Guidelines

Create battery EOL guidelines to establish best practices and standards for second-life and EOL battery management.

Short Term (6 months - 1 year)

While it is early days in Uganda, there are **no clear guidelines for electric vehicle batteries** after they have spent their useful roadworthy life. These batteries are highly valuable and stacked with key minerals, which can also pose a local threat to the environment if disposed of improperly.

There is a **significant opportunity in second-life EV batteries**, which at 80% state-of-health remain more capable than the currently dominant lead-acid batteries (which typically can only discharge to 50%) used in most home and commercial solar applications in Uganda. However, there is little consumer education on the matter, and upfront costs of lead-acid - which remain lower than lithium-ion batteries despite having a significantly shorter lifespan - continue to deter consumers.³⁶ Companies currently engaged in addressing this opportunity include Soleil Power who have secured grant funding to pilot the introduction of second-life lithium-ion ESS products using cells previously operated in Zombo's fleet. Additional grant funding to pilot the use of EV batteries in off-grid or backup setups could help the second-life EV battery ecosystem take off.

The ongoing Kenya Electric vehicle Battery Initiative (KeEBI) work by AfEMA, supported by the Drive Electric program, seeks to establish key guidelines around end of road life, second-life, and recycling and disposal of batteries. A similar **battery EOL guideline should be made or adapted** in Uganda to establish these guidelines.

³⁵ "DRIVE Project: GOGO Electric and GIZ upskill 104 Ugandans in e-mobility." Accessed: <https://gogo.co.com/drive-1-0/>

³⁶ While there wasn't the space to explore this here, the government could also help demonstrate the usefulness of second-life EV batteries by installing them as backup in government buildings and installations.

5.2.6 Charging Infrastructure

Rapidly build out charging infrastructure to reduce range anxiety for electric cars and buses and allow for EV movement across the country.

Short to Long Term (6 months - 10 years)

Notwithstanding the recent withdrawal of incentives for electric cars, **charging infrastructure and electric passenger cars currently face something of a chicken-or-egg situation** in Uganda. Private EV charging infrastructure providers are hesitant to build the infrastructure as there aren't enough electric vehicles to provide the revenue needed to pay back investments in this infrastructure, and electric vehicle retailers struggle to sell electric passenger cars to consumers concerned about a lack of public charging infrastructure.

The government can solve this issue for electric cars and buses by **building EV charging infrastructure**, targeting at least two chargers within all fifteen cities in Uganda and chargers at minimum every 150 km on major arteries. This would serve as an intermediary, lower-cost measure before the installation of chargers every 50 km radius as per the National E-Mobility Strategy, allowing electric vehicles to reach and operate in all urban centers in Uganda.

The government and DFIs should explore the potential for public-private partnerships to open up charging stations for passenger cars and buses across the country. This can help create consumer confidence and reduce range anxiety. However, this will need to be done hand-in-hand with efforts to reduce the price of electric cars and buses through fiscal incentives, to ensure that EV charging stations do not become stranded assets.

"Most towns should get [charging] stations, so that people can confidently buy EVs."
Kalyango, ICE car dealer

5.3 Non-Policy Options

5.3.1 Interoperability Coalitions

Finance novel interoperability pilots to support the expansion of accessible swap stations for e-motorcycle riders.

Short to Medium Term (6 months - 3 years)

While there are now around 125 battery swap stations in Uganda serving around 3,000 e-motorcycles, they are spread between three exclusive battery swap networks. This means that e-motorcycle operators cannot access all 125 swap stations, instead accessing only the portion of them that the e-motorcycle provider operates. This exacerbates the scarcity of EV charging infrastructure.

While government-led homogenization is not recommended as it would artificially limit competition, companies should seek to create interoperable networks that would allow operators to access more swap stations, which would tackle the primary reason cited by petrol motorcycle

operators for preferring to stick with petrol motorcycles. Interoperable networks could work in several different operational structures across the motorcycle, battery, and swap station. Between motorcycle and battery, it could be a standard battery which works on multiple e-motorcycle brands, or a motorcycle brand which could take multiple battery types. Between battery and swap station, it could be a battery that can be charged at multiple swap stations, or swap stations that can charge multiple types of batteries, or both.

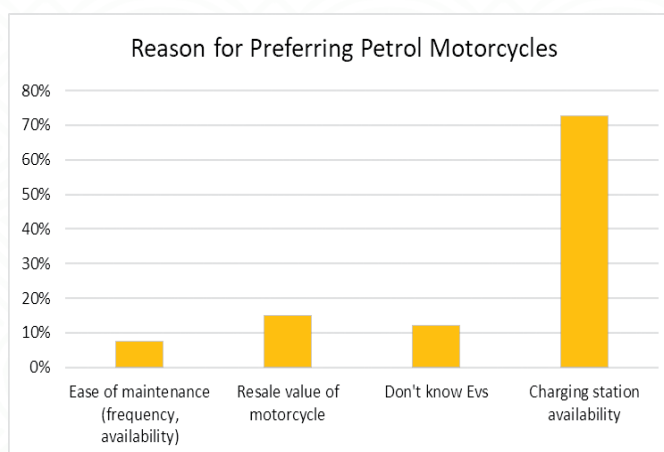
While this needs to be led by the e-motorcycle companies themselves to ensure that it is feasible, financially sustainable, and does not eliminate competition, there will be a need for **pilot financing to test interoperable networks**. In Kenya, for example, GIZ through Siemens Stiftung has funded an interoperable battery being used by vehicles from Ecobodaa, eWaka, and Kiri EV.³⁷ Similar funding should be made available in Uganda for willing partnerships that could then help expand the availability of swapping stations for the rapidly growing number of e-motorcycles on the roads.

5.3.2 Invest in Swap Stations

Increase investment in swap stations to reduce range anxiety for electric motorcycles and allow for EV movement across the country.

Medium Term (1 - 3 years)

The lack of charging and swapping stations remains a major impediment to the expansion of e-mobility in Uganda. A survey in July 2024 furthermore found that fueling station availability is the main reason current petrol motorcycle riders continue to prefer petrol motorcycles, cited by 73% of respondents, nearly five times more than any other reason.³⁸ Electric and petrol users in focus groups additionally highlighted the lack of charging stations as the primary barrier to adoption.³⁹



Swap station infrastructure for motorcycles, which is privately owned and has already been expanded significantly, instead requires increased investment in the form of equity and concessional debt. Development finance corporations such as the International Finance Corporation (IFC), the Development Finance Corporation (DFC), and Uganda Development Bank (UDB) should step in to provide concessional debt financing, with the support of loan guarantors. Equity investors should also step in to support swap station expansion. Local investors, pension funds and banks, which tend to be overly reliant on government bonds, should be encouraged to invest in the sector to ensure that benefits are felt more locally, without over-dependence on foreign shareholders who have less of a stake in the nation's economy. Financiers should experiment with novel tools

37 "3 e-mobility companies. 1 battery. Get on the interoperability train," Kim Chepkoi via LinkedIn, October 1, 2024. https://www.linkedin.com/posts/kimosopchepkoi_3-e-mobility-companies-1-battery-activity-7244730116788862976-3T6C

38 Lubyanza Quarterly Report, July 2024.

39 Focus groups.

to finance the swap stations - such as that recently introduced by CrossBoundary Energy and Ampersand in Kenya.⁴⁰ This can help to not only densify swap networks in Kampala but also to expand it and connect it to other towns, starting with Entebbe and Jinja and then moving along main roads to towns further afield.

5.3.3 Conduct Public Awareness Campaign

Establish an EV public awareness campaign to ensure the population understands EV technology

Short to Medium Term (6 months - 3 years)

While the public is rapidly learning about EVs in Uganda, **there remains widespread misinformation about EVs**, particularly outside of Kampala. This misinformation dampens enthusiasm and at its extreme can undermine trust in the market. In focus groups, electric car and motorcycle users expressed apprehension and had basic misunderstandings of how electric vehicles operate and their risks - but most express an interest in and willingness to learn.

An EV public awareness campaign should make sure to address all market segments, across the country, with a focus on the local means of transmission and local languages. This means including content to tackle all three major market segments: passenger cars, buses, and motorcycles, and to find the channels each group uses. This could be radio shows in local languages, best done to track as EV availability spreads across the country, or it could be TikTok shorts that are also then sent out on WhatsApp groups. It should also include directly meeting with groups and providing for test drives, such as public expos and demonstration events.

"People need to be sensitized about electric motorcycles. One time I got a request and the client asked "it is an electric bike? Won't I be electrocuted?""

Namakulah, e-motorcycle

Strategic partnerships with development partners such as the World Bank, GIZ, and AfDB would help to amplify advocacy efforts and extend the reach of the programming. A wide-ranging, cost-effective EV public awareness campaign would help EV penetration move past the initial enthusiasts to the broader population and will be necessary to extend the message further afield reach higher levels of penetration.

40 "Ampersand and CrossBoundary Energy rev up Kenya's e-mobility transition with solar-powered charging and batteries for e-bikes," CrossBoundary Energy, September 9, 2024. <https://crossboundaryenergy.com/kenyas-e-mobility-transition-revs-up-with-solar-powered-e-bikes/>

6. Advocacy Plan

Advocacy for the e-mobility sector requires taking these recommendations directly to policymakers and technocrats. Below we show the channels and specific requested actions, along with the reasoning that should be used as to how these actions will support the e-mobility sector.

Advocacy should necessarily be done in coalition with other organizations and through constructive conversations with policymakers. Regular consultations with government ministries, including MoWT, MEMD, and STI will be critical to advocating for the interests of the e-mobility sector. Additional research, such as a market study, papers or presentations, are likely needed to get these messages across. As tax incentives are typically passed in the annual budget, it is necessary to engage with Parliament and policymakers with this in mind, to ensure conversations are active during the creation of the Finance Bill in January to May.

6.1 Key messages

Organization	Requested Action	Reasoning
Parliament of Uganda	Pass an E-Mobility Act that includes the following: • VAT exemptions for locally assembled motorcycles and electric three-wheelers under HS code 8711 (or the relevant HS code upon creation of a distinct HS code for CKD E2&3W) • Import duty and VAT exemptions for imported electric cars for the first 10,000 electric passenger cars registered in the country. ○ 10% import duty and 9% VAT after the first 10,000 electric cars. • VAT exemptions for the first 2,000 electric buses and minibuses (HS code 8415 and 8703) regardless of location of manufacture. • 10% import duty on imported buses. • Import duty exempted on all parts and machinery used for electric vehicle manufacturing (<i>as in the Finance Act of 2024/25</i>) until 2030, inclusive of value chain actors providing critical components such as battery cells.	This will lower costs for consumers while providing certainty and stability for the entire e-mobility industry. It will also keep additional advantages for locally manufactured buses by only reducing import duty for imported buses and not exempting it entirely.

MoFPED	<i>The E-Mobility Act proposed above</i> ● Publish a letter clarifying the status of Li-On batteries and cells ○ Send to all customs offices ○ Provide a copy for e-mobility companies	To clarify and provide support to companies importing lithium-ion batteries and lithium-ion battery cells .
MEMD	● Complete the e-mobility diagnostic currently being worked on with the World Bank ● Establish and implement charging infrastructure plan ● Enact the Energy Transition Plan to upgrade the transmission and distribution grid and expand access to grid electricity. ● Establish EV battery second-life and EOL guidelines	To create the backbone of an EV charging infrastructure and ease the introduction of electric cars and buses. To upgrade the electricity grid and improve the reliability of EV charging and swapping infrastructure. To create trust in electric vehicles by setting standards for EV battery roadworthiness; and to create the guardrails for a second-life EV battery market.
MoWT	● Complete full assessment of government vehicle fleet ● Set a government EV procurement plan that targets a goal of 100% transition to electric vehicles by 2040, and an intermediary goal of 25% EVs by 2030. The plan should include a focus in particular on: ○ 1) low-hanging fruit, such as electric motorcycles and high usage, urban vehicles ○ 2) high visibility vehicles, such as the Presidential fleet	This will create demand for electric vehicles, particularly passenger cars , by one of the only institutions able to afford new vehicles.
STI	● To actualize the National E-Mobility Strategy	To enact the overarching policy for the e-mobility sector in Uganda.
ERA	● Finalize and publish the Electric Vehicle Charging Infrastructure Guidelines ○ Integrate battery swapping throughout the guidelines ● Conduct a thorough review establishing the need for and parameters for a special EV tariff	To provide regulatory clarity for EV charging and swapping stations. To establish the need for an EV tariff and if so, to codify one.

Ministry of Education	- Establish EV curricula - Integrate EV curricula in electrical and mechanical programs at vocational schools and tertiary institutions throughout Uganda	To create a modern EV workforce and fulfill the National E-Mobility Strategy's goals of 250,000 receiving specialized skilling along the e-mobility value chain.
Uganda Development Bank	Fund the creation of the EV charging network backbone	To kickstart the transition to electric cars and buses,
UNBS	Establish standards for electric vehicles and charging infrastructure	To provide quality guardrails for the e-mobility industry and ensure trust in product quality.
EAC	Establish distinct HS codes for CKD EVs, particularly e-motorcycles	To enable the creation of a specific import duty exemption for CKD EVs.
International donors (EU, GIZ, UNEP, etc)	- Support interoperability pilots for e-motorcycles in Uganda - Fund second-life EV battery pilots - Fund the creation of industry-wide EV technical trainings and implementation at TVET level.	To kickstart interoperability and reduce range anxiety for e-motorcycle riders. To kickstart second-life EV battery usage and extend usable battery life. To build EV technical capacity more broadly.
Development finance institutions	Finance battery swapping stations for e-motorcycles	To expand battery swap networks and reduce range anxiety for e-motorcycle riders.



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