E-Mobility as a Driver for Change
Towards a Gender Transformative and Just Transition to Electric Mobility

Uganda Baseline Report on Gender and E-mobility

August 2024

Federal Ministry
for Economic Cooperation
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Authors

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Executive Summary

Uganda's transport sector is currently defined by men driving heavily polluting internal combustion engine (ICE) vehicles on poor quality roads. Motorcycle-taxis have come to be a defining aspect of the transport sector in Uganda, particularly in regional towns and rural areas.[1] Women report widespread harassment in the transport sector and are vanishingly rare as motorcycle-taxi or minibus operators. While they represent less than 1% of motorcycle-taxi drivers, they have made more inroads in government roles and in mobility startups. However, official gender-disaggregated data on the sector is severely lacking, with only very limited public data on vehicle imports and registrations, workforce composition, the occasional qualitative report on women in transport, and private sector data that is not made public.

Over the past few years, the electric mobility industry has begun to grow in Uganda, with the private sector leading the charge with a heavy focus on battery-swapping electric motorcycles. The government has begun to deploy incentives and benefits to support the sector, initially removing import duties on certain electric vehicle (EV) imports and then switching that towards an EV manufacturing focus in the 2024/25 budget. This has provided VAT exemption on locally manufactured EVs and charging services, while exempting investors from income tax and excise duty on e-mobility manufacturing investments. However, the e-mobility sector in Uganda remains nascent, with just over 3,000 electric vehicles on the road in a country with around 1.8 million registered vehicles as of August 2024.

The e-mobility industry in Uganda has begun to address some of the major gender gaps in transportation but remains a long way off in gender parity in both leadership and ridership. From a brief survey of the sector, women tend to make up between 30-50% of the e-mobility startup workforce, but without known female founders or executives. Additionally, women electric motorcycle riders represent only around 2.3% of the e-motorcycle fleet, though this is higher than the less than 1% operating in the ICE motorcycle fleet.

While women still face significant obstacles in the boardroom, on the factory floor and on the street, the e-mobility sector has the potential to improve the roles and outcomes for women in the transport industry. To do so will require confronting the harassment and biases faced by women in the sector and boosting Science Technology, Engineering and Maths (STEM) programs for women. It will also require adjusting transportation operations and working hours to better fit women's needs. Finally, there is a need to strengthen gender-disaggregated data collection in the e-mobility sector in order to pinpoint and tackle the key issues that women are facing in the sector. Electric mobility represents a fresh start for the transport sector and should be utilized to its maximum to create more just and gender inclusive mobility systems.

[1] While motorcycle-taxis account for around 40% of motorized trips in Kampala ("Unpublished Kampala transport survey 2021," WRI), they account for 90% of motorized trips in regional towns ("Moving in Growing Cities: Barriers to Accessibility in Fort Portal and Mbale," by Courtright).

Glossary of Acronyms

2W	- Two-wheeler
3W	- Three-wheeler
AfEMA	- Africa E-Mobility Alliance
CBOs	- Community-Based Organizations
CO2	- Carbon Dioxide
CREEC	- Centre for Research in Energy and Energy Conservation.
CSOs	- Civil Society Organizations
EAC	- East African Community
EM	- Electric mobility
EV	- Electric vehicle (inclusive of all vehicle types)
GHG	- Greenhouse gas
ICE	- Internal combustion engine
KCCA	- Kampala Capital City Authority
NGO	- Non-Government Organisation
OEM	- Original Equipment Manufacturer
SDG	- Sustainable Development Goal
STI	- Science, Technology and Innovation
WRA	- Women Rising for Africa
MEMD	- Ministry of Energy and Mineral Development
MoWT	- Ministry of Works and Transport
GKMA	- Greater Kampala Metropolitan Area
ICEs	- Internal Combustion Engines
KIIs	- Key Informant Interviews
UEMA	- Uganda E-Mobility Association
UNEP	- United Nations Environment Programme

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Overview

Uganda's transport sector – heavily reliant on fossil fuel-burning-vehicles – is presently dominated by men. Privately owned vehicles motorcycle-taxis (called boda bodas) and 14-seater minibuses account for the vast majority of motorised trips in the country, with over 90% of their drivers and conductors being male. But electrification is slowly gaining pace. Over 3,000 electric vehicles (EVs) are now on the road in Uganda, over 96% of them being motorcycles utilizing battery-swapping stations. While the switch from internal-combustion engine vehicles (ICEs) to low emission battery electric vehicles has clear positive implications for the country's air pollution, oil imports and transportation operating costs, it also presents opportunities for accelerating changes in the gender composition of the country's transport scene.

The Transport Sector in Uganda

Since the deterioration of the Uganda Railway in the 1970s, nearly all of the country's land transport has been road-based. Uganda's vehicle fleet has grown significantly over the past 30 years and relies almost entirely on imported ICE vehicles burning petrol and diesel. These contribute to the country's greenhouse gas (GHG) emissions, which nearly doubled from 53 Mt CO2e in 2005 to 90 Mt CO2e in 2015 and continue to rise, with the transportation sector accounting for an estimated 4.6% of emissions in 2015.[2] As Fig. 1 shows, emissions are expected to continue to grow in Uganda over the next quarter-century, with a doubling of transport emissions by 2030 from the 2015 baseline in the business as usual scenario.

[2] "Updated Nationally Determined Contributions", Ministry of Water and Environment, 2022; p.39 & p42. Retrieved from: https://unfccc.int/sites/default/files/NDC/2022-09/Updated%20NDC%20_Uganda_2022%20Final.pdf. Note that the share of transportation in the 2019 NDC is 2.561 Mt (alternatively written as 2,561 Gg). The 2022 figure was used as it was assumed calculations were updated.

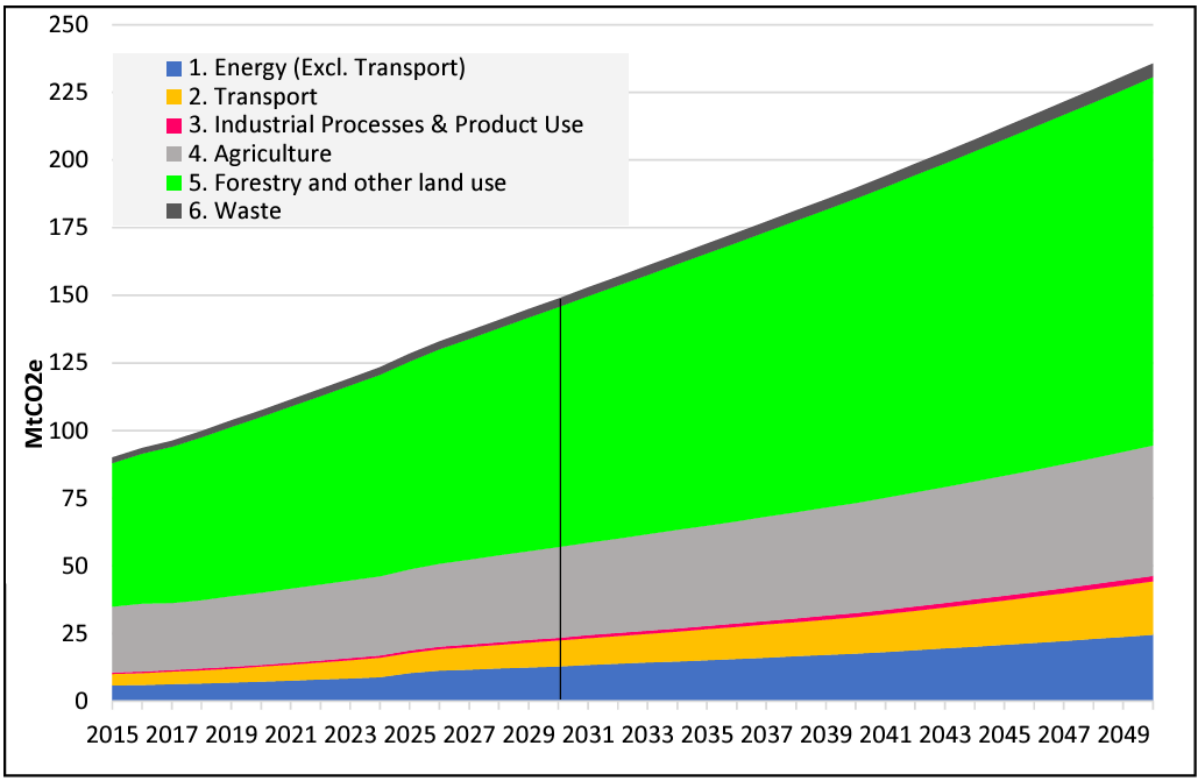

Figure 1 CO2 emissions in Uganda from 2015-2030 under a business-as-usual scenario. Source: Updated Nationally Determined Contributions, 2022.

ICE vehicles in Uganda have also contributed to Kampala being ranked as the worst polluted cities in East Africa and driven up operating costs for users.[3] The public transport system in the Greater Kampala Metropolitan Area, which is reliant on petrol- and diesel-powered minibus taxis, boda-bodas and a rapidly growing number of private vehicles, has created heavy traffic congestion and poor air quality. Around 26,000 people in Uganda died in 2022 alone as a result of cardiological complications caused by local air pollutants.[4] An estimated 24,000 working hours are lost daily to traffic in Kampala, representing approximately USD 800 million in annual productivity and an additional USD 54 million each year in added fuel consumption.[5] Amid the dual challenges of urbanisation and population growth, the need for sustainable, efficient and equitable transport solutions is more pressing than ever.

Gender Inequity in Transport

Women are significantly underrepresented in the transportation sector in Uganda and their mobility needs are rarely, if ever, incorporated. They are also heavily underrepresented in the transport workforce. Boda boda riders, the largest group of transport workers in Uganda with an estimated 1.1 million members, are over 99% male.[6] Minibus taxi drivers and conductors in Uganda are also

[3] "Kampala worst air-polluted city in East Africa," Nile Post, May 7, 2024. https://nilepost.co.ug/news/198562/kampala-worst-air-polluted-city-in-east-africa
[4] Lord Mayor Erias Lukwago narrates during the launch of Zembo thunder boda boda (2024)
[5] Draft National E-Mobility Strategy (2023)
[6] "The Wheels of Change: Safe and Sustainable Motorcycles in Sub-Saharan Africa," Bishop and Courtright, 2022.

overwhelmingly male, along with the mechanics who service these vehicles.[7] Key informant interviews (KIIs) with industry stakeholders reveal that only a handful of women presently work as skilled labour or vehicle operators, for ICE vehicles and EVs alike.

While some women participate in Savings and Credit Cooperatives (SACCOs) that support the transport sector or in transport-focused Non-Government Organisations (NGOs) and government bodies, they remain under-represented. This gender gap starts upstream in the realm of education, with women accounting for only around 20% of engineering students in Uganda, resulting in a similar dearth of women working in the fields of science, technology, engineering and mathematics (STEM).[8]

These obstacles are compounded by a physical infrastructure that is often unaccommodating to women's needs. Public bathrooms are few and far between, with most requiring payment for entry, adding additional costs to low-paid work for menstruating women and those who breastfeed. The challenges of this work environment are supported by the findings from stakeholders, which indicate that women in the transport sector tend to prefer office jobs, which though comparatively comfortable, are vanishingly few – especially in informalized subsectors like boda bodas.[9]

The scarcity of qualified women in STEM, coupled with a lack of accommodating physical infrastructure (in particular, washrooms and breastfeeding spaces) and an industry culture marked by widespread harassment all present significant obstacles for women to participate equitably in Uganda's transport scene, whether as workers, as leaders, or even as passengers. [10]

Women in E-Mobility

The transition to e-mobility presents an opportunity to improve women's roles, representations and experiences in the traditional and mainly informal transportation industry. The creation of new industries provides a significant opportunity to increase women's share of the workforce and, importantly, to also ensure women's needs are duly considered in EV design and business models. A holistic approach, utilizing gender-disaggregated data to increase the number of women trained in STEM, reducing sexual harassment and improving female participation in the e-mobility workforce can deliver significant benefits both to women in particular and to Ugandan society generally.

Many e-mobility companies in Uganda are putting in place measures to include more women in their operations.[11] But women's role in the country's EV transition remains hampered by challenges like inappropriate vehicle design, negative social, cultural and religious stigma, inappropriate operational styles, unfavourable working hours and gendered skill gaps. Overcoming these obstacles will require

[7] "Kampala Bus Rapid Transit: Understanding Kampala's Paratransit Market Structure, "Spooner and Mwanika, 2020

[8] "Tracer Study of Engineering Graduates in Uganda," Uganda National Council for Science and Technology, 2016. Retrieved from https://www.uncst.go.ug/manage/files/downloads/Tracer%20Study%20Report%202016.pdf

[9] While the taxi sector includes route organisations and SACCOs that require record-keeping, the boda boda sector is highly fragmented and self-regulated, with boda boda stage members conducting their own record keeping - leaving few jobs for women.

[10] "Creating an Informal Transport Route," Kerzhner, Tamara. https://www-tandfonline-com.ezproxy.uct.ac.za/doi/full/10.1080/01944363.2024.2307920

[11] The National E-Mobility Strategy (2023) envisages a 12.5% Contribution of the Mobility Sector to National GDP by 2030, Over 500,000 Green Jobs created directly and indirectly by 2040 and Production of over 10,000 Electric Buses and 1,000,000 electric motorcycles by 2030 for import substitution and export.

targeted efforts to reduce stigma, greater consideration of women's specific needs when it comes to EV design, reforming the sector's operational model and hours of work to provide greater flexibility, and providing training to impart knowledge and skills specifically targeted at women.

Transitioning to electric vehicles will also benefit Uganda economically. Reducing the share of ICEs in the country's vehicle fleet will not only reduce its reliance on imported fossil fuels but also increase consumption of locally generated electricity. Initiatives to establish robust charging infrastructure, supported by regulatory frameworks and incentives, can further expedite the adoption of e-mobility nationwide and create new green jobs.

Methodology

To analyse e-mobility and gender inclusiveness in Uganda, we undertook a thorough desktop review of the current transportation landscape, with a particular eye towards policy, society and infrastructure concerns. These included reviews of national, regional and international reports such as an unpublished 2021 World Resources Institute (WRI) survey on modal split and challenges by gender, along with World Development Indicators from the World Bank. These were compiled in a database.

We then carried out a series of in-depth interviews with relevant transport sector stakeholders, including private actors, government agencies and civil society groups. These yielded deep insights into gender, e-mobility and the opportunities, gaps, and recommendations for advancing women's role in the electrification of transport in Uganda. Twenty-seven interviews were conducted, comprising 15 women and 12 men in the Greater Kampala Metropolitan Area (GKMA). The interviewees were between the ages of 25 and 60 years old and were selected because of their key roles in the e-mobility landscape as entrepreneurs, operators, mechanics, policymakers and others.

Private sector actors consulted included the e-mobility companies Gogo, Zembo, Kiira Motors, Karaa Africa, Modjo Energies, Soleil Power, Greenhub Kampala and Spiro. We further expanded our research to include the supportive ecosystem of financing companies such as Watu and ride hailing companies like SafeBoda. Government agencies critical to the transition, chief among them the Science, Technology and Innovation (STI) Secretariat under the Office of Uganda's President, the Ministry of Works and Transport and the Ministry of Energy and Mineral Development, were also consulted. Additionally, we spoke with non-governmental actors working in partnership with e-mobility companies to expand access and benefits for youth and women in transport, including the Institute for Transportation and Development Policy (ITDP), Access2innovation, Women Rising for Africa (WRA) and the Smart Girls Foundation.

Finally, we drew on a focus group discussion that was held on August 9th in Kampala with a mix of female and male ICE and EV boda boda riders. As shown in Fig. 2, it was a nearly equal split of men and women, and between petrol and electric motorcycles. Respondents discussed the comparative experiences of men and women as transportation workers and users, the appropriateness of electric vs ICE motorcycles for their work, and the potential for e-mobility to be gender-transformative.

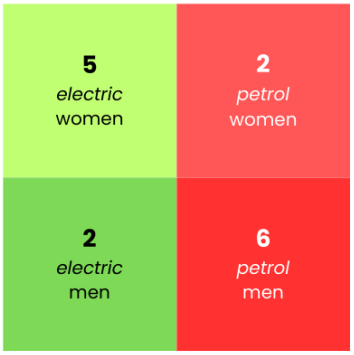

Figure 2 Boda boda focus group participants

Gender and Transport in Uganda

Unlocking the potential of gender equality and inclusion

Globally, women's quality of life tends to lag behind men's, with unequal access to education, jobs, and independence presenting a major barrier to women's empowerment. In addition, women's marginalisation from government and the economy hinders both economic development and social justice. Uganda's case follows this general trend but is complicated by the very traditional gender roles, a highly informal transport system and limited gender-disaggregated data to inform policymaking.

The Global Gender Gap Index by the World Economic Forum compares countries' gender gaps across four dimensions: economic opportunities, education, health and political leadership. In recent years, Uganda has fluctuated between 0.706 and 0.725 in the Global Gender Gap Index, most recently ranking 71st globally among 146 ranked countries.[12] While the economy has recorded gains in promoting gender equality and girl-child education, gender gaps remain at all levels of schooling, with girls and women making up 47% of students in secondary and 44% in tertiary institutions, marking a significant decline in access for girls and women as education levels progress.[13] These disparities in education are reflected across the economy.

Policies to Mainstream Gender in Uganda

Over the past few decades, gender mainstreaming in Uganda has been advanced by a series of progressive policies.

The Constitution of Uganda (1995)

Uganda's constitution upholds and defends the rights of women, calling on the state to take affirmative action to redress their historic marginalization from governance and the economy while providing them the facilities and opportunities necessary to reach their full potential.

The National Gender Policy (1997)

The National Gender Policy (NGP) and its revision a decade later in 2007 mandate that all government policies and programmes are consistent with the long-term goal of eliminating gender inequalities and imbalances. The policy gives a clear mandate to the Ministry of Gender, Labour and Social Development and other key ministries to mainstream gender in all sectors. The ultimate objective of this policy is to therefore evolve a society that is both informed and conscious of gender and

[12] WEF scored Uganda 0.706 in 2023; 0.7249 in 2022 up from 0.717 in 2020. "World Economic Outlook - Global Gender Gap Report for 2022," World Economic Forum. Retrieved from: https://www3.weforum.org/docs/WEF_GGGR_2022.pdf, and 2023 https://www3.weforum.org/docs/WEF_GGGR_2023.pdf

[13] "Gender in education sector Policy (2016)," Ministry of Education and Sports. Retrieved from: https://planipolis.iiep.unesco.org/sites/default/files/ressources/uganda_gender_in_education_sector_policy.pdf

development concerns. "Sustainable development calls for maximum and equal participation of both men and women in economic, political and social cultural development," the policy states.[14]

The Equal Opportunities Commission Act (2007)

This act establishes the Equal Opportunities Commission, which is mandated to create fair and equal treatment of all people regardless of the sex, race, colour, ethnic origin, tribe, creed, religion, social or economic standing, political opinion, disability, gender, age or any other reason created by history, tradition or custom.

Other Relevant Policies

The passing of the Social Protection Policy (November 2015) aimed to operationalise the progressive tenets of the 1995 Constitution and to promote secure tenure and gender-equitable utilisation of national resources.[15] The Early Child Development Policy (March 2016) focused on reducing women's care workload and improving their opportunities. It includes provisions for improving maternal care – though the policy's implementation remains incomplete.[16]

Women in Government

Although women make up only a third of the members elected to Uganda's current parliament in 2021, nearly half of the country's 81 cabinet and state minister posts, including the top slots of Prime Minister (Robinah Nabbanja) and Vice President (Jessica Alupo) are occupied by women. The appointment of these latter figures in 2021 marked an increase in the percentage of women in Uganda's cabinet from 27% to 43%.[17] Power, however, continues to rest heavily in the hands of the male executive.[18] Meanwhile, the gender-centred legislation described above has proven to be a driving force for reducing gender inequities in the country's governance.

Women in the Workforce

Women's employment as a share of the labour force has grown significantly in Uganda, having reached nearly 50% before taking a slight dip in 2020 due to the impacts of COVID-19. The labour force participation rate among females over 15 years of age was 67.6% in 2023, compared to 72.4% of their male counterparts, according to World Bank estimates.[19] Over time, Uganda's formal labour force

[14] "The Uganda Gender Policy (2007)," Women In Development / Gender and Development. Retrieved from: http://faolex.fao.org/docs/pdf/uga163564.pdf
[15] "The National Social Protection Policy, 2015", Parliament of Uganda. https://socialprotection.go.ug/wp-content/uploads/2016/07/National-Social-Protection-Policy-uganda.pdf
[16] "National Integrated Early Child Development Plan," 2016. https://www.health.go.ug/cause/the-national-integrated-early-childhood-development-policy-action-plan-of-uganda-2016-2021/
[17] "Women appointed to top positions in Uganda, but feelings are mixed," the Conversation, June 15, 2021. Retrieved from: https://theconversation.com/women-appointed-to-top-positions-in-uganda-but-feelings-are-mixed-162614
[18] 173 of 529 MPs are women. UN Women- Gender gaps and country performance 2023 - https://data.unwomen.org/country/uganda
[19] World Bank Databank. Retrieved from: https://databank.worldbank.org/reports.aspx?source=2&country=UGA

participation rate for females has surpassed that of Eastern and Southern Africa, particularly in services, sales and among professionals, as shown in Fig. 1.[20]

But these seemingly equal figures bely a deep inequality: women's salaries in Uganda remain significantly lower than those of men and, while women are taking part in the workforce broadly, they are markedly less prevalent in positions of power.[21]

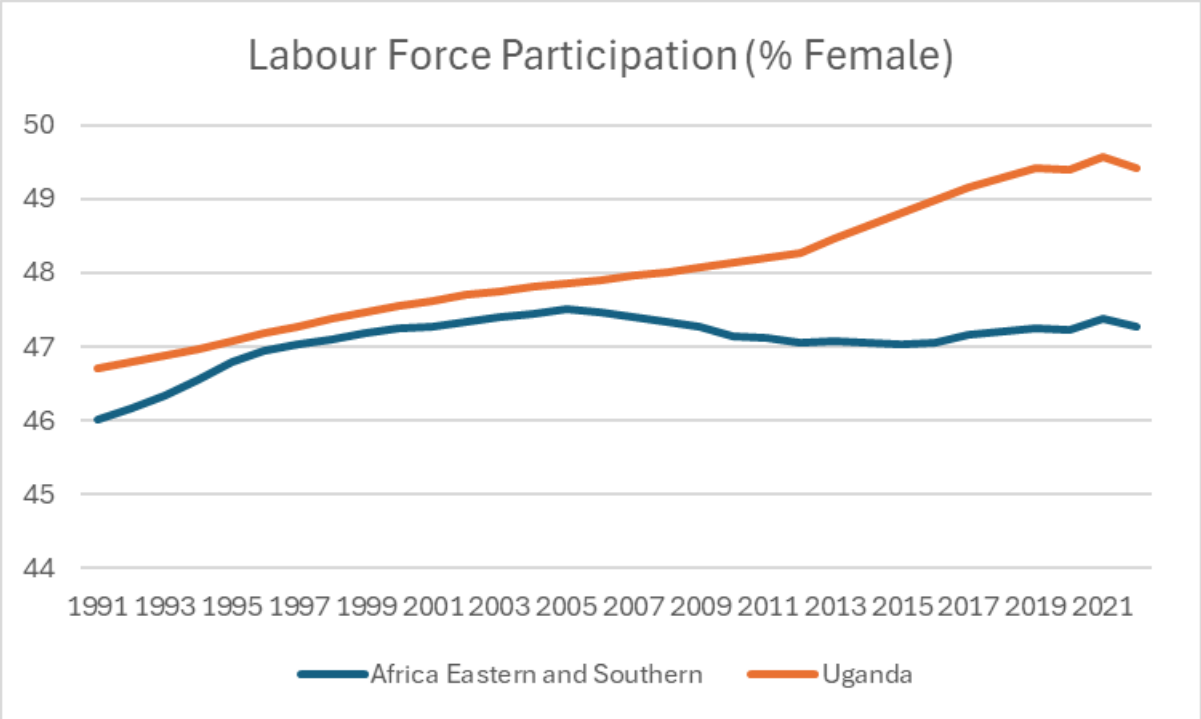

Figure 3 Labour force, women (% of total labour force). Source: World Bank (2023)

Gender pay gap

The aforementioned gender pay gap means women in Uganda generally earn 32.3% less than men. But this number shoots up for women whose education has not gone beyond primary school, who earn on average only 543 UGX for every 1,000 UGX (i.e. $0.54 to $1) a man can make. Those with tertiary educations don't fare much better, earning 661 UGX for every 1,000 UGX ($0.66 to $1) a man takes home.[22]

A WRI transport survey in 2021 found a similar picture of heightened gender wage inequality among low-income people: More women than men earned under 50,000 UGX (USD $13.2) on a given day,

[20] "Gender Pay Gap and Labour-Market Inequalities in Uganda," https://africa.unwomen.org/sites/default/files/2024-03/un_women_uganda_gender_pay_gap_brief.pdf
[21] "World Bank Open Data," World Bank, 2022. https; databank.worldbank.org
[22] "Gender Pay Gap and Labout-Market Inequalities in Uganda," UN Women, 2024. Retrieved from: https://africa.unwomen.org/sites/default/files/2024-03/un_women_uganda_gender_pay_gap_brief.pdf

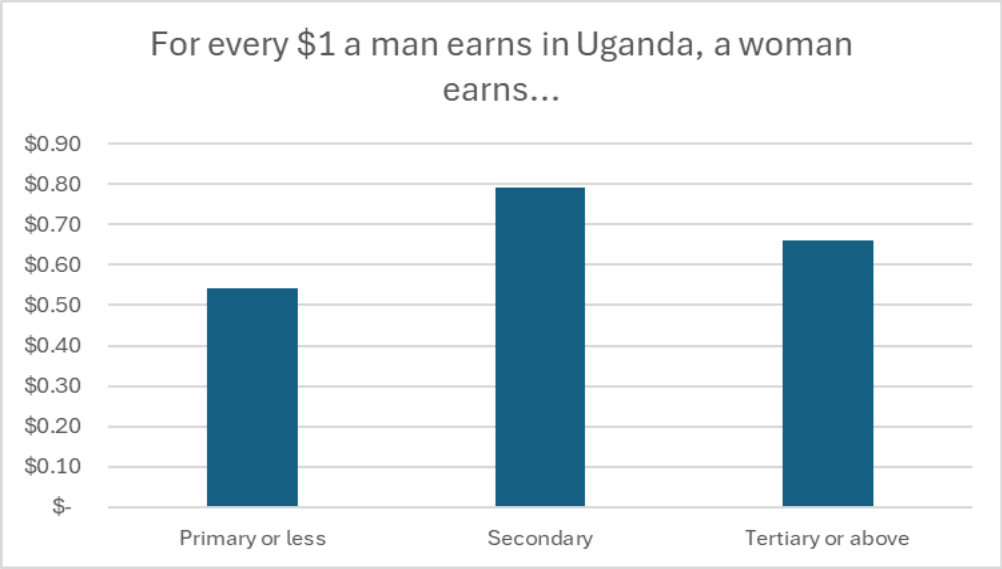

Figure 4 Gender wage gap in Uganda. Source: "Gender Pay Gap and Labour Market Inequalities in Uganda," UN Women.

while more men earned between 50,001 and 100,000 UGX (about USD $13.2-$26.3) and over 200,000 UGX (USD $52.4).[23]

Uganda's Transport Sector

Uganda's transport system can be divided into four sectors: Road transport, rail transport, air transport and inland water transport. Road transport is by far the most dominant mode, conveying more than 95% of the total passenger and cargo freight traffic over 159,520 km of documented roadways.[24] This subsector is also the only one with significant potential to electrify, as technical and cost hurdles remain for air transport, while rail and water transport have been subject to decades of neglect. Though less than 5% of roads in Uganda are currently paved, the country has a target of tarmacking 80% of its 21,000 km national road network by 2040.[25]

Table 1 Coverage of major roads in Uganda. Source: GIZ.

Road Type	Total length (km)	Paved
National Roads	21,010	25.7%
District Roads	38,603	0.3%
Urban Roads	19,959	6.2%
Community Access Roads	79,948	<0.1%

[23] From an unpublished WRI survey of over 600 Kampala residents. 1 USD = 3800 UGX.
[24] "Data Collection for Climate Change Mitigation Potential Analysis and Scenario Development in Uganda's Transport Sector," GIZ. Retrieved from: https://changing-transport.org/wp-content/uploads/Final-Data-Collection-Report.pdf
[25] Ibid (GIZ)

25.7% of national roads are paved compared to less than 0.1% of community access roads. These unpaved access roads represent the majority of the country's total network, extending for about 80,000 km. Urban roads account for the smallest coverage area, extending for about 19,959 km.

The transport sector runs almost entirely on imported fossil fuels like petrol and diesel, causing significant rates of greenhouse gas emissions and air pollution. Road based transportation in Uganda is split between four primary sub-modes, which, in rough order of predominance are: walking, boda bodas (motorcycle-taxis), taxis (14-seater minibuses), private cars, and buses (primarily used for inter-urban travel).

In both urban and rural Uganda, boda bodas have come to play a major role in transportation. But this crucial subsector remains poorly regulated, male-dominated, and haphazardly organised. Boda bodas establish stages wherever they have some degree of local self-regulation, but attempts to form umbrella associations or unions are often highly-politicised and boda riders tend to report low levels of satisfaction with these organisations' leadership.[26]

14-seater minibuses on the other hand, which Ugandans dub 'taxis', were once one of the only nationally organised transport fleets in Africa under the Uganda Taxi Operators and Drivers Association (UTODA). But UTODA came to be understood as highly exploitative and was largely dismantled by the Kampala Capital City Authority in 2012. No single unifying body has since re-emerged. Both taxi drivers and conductors are overwhelmingly male, though no recent statistics could be found for this report.[27]

Vehicle Fleet

With road transport being the fastest growing sector in the country, the past decade has seen Uganda's vehicle fleet nearly double. As of July 31, 2023, 1,859,750 vehicles were registered on the Electronic Tax System Database (eTax) – though no de-registration system currently exists. During the extended COVID-19 lockdown, which included both school closures and nighttime curfews until January 2022, there was a significant slowdown in vehicle purchases. In the year that followed, sales rebounded forcefully, nearly doubling, with two thirds of the purchases being motorcycles. A tabulated list of the breakdown of all motor vehicles registered, per category, is in Table 2.

[26] Lubyanza Quarterly Report April 2024. Retrieved from https://www.tomcourtright.com/lubyanza
[27] "Statistical Evidence of Women's Use and Experience of Public Transport in Kampala," UN Women, October 2021. Retrieved from: https://data.unwomen.org/sites/default/files/documents/Publications/Statistical%20evidence%20of%20women's%20use%20and%20experience%20of%20public%20transport%20in%20Kampala0312202101.pdf

Table 2 Summary of motor vehicles registered each financial year by vehicle category as of July 31, 2023. Source: Ministry of Works and Transport (2024)

Vehicle Category	Before Nov 2021	2021/22	2022/23	Total
Buses - Minibuses, Heavy Omni Buses	20,635	1,521	2,720	**25,126**
Light & Heavy Goods Vehicles[28]	131,375	12,103	21,020	**166,759**
Engineering Plants	8,510	870	1,312	**10,835**
Motor Cars[29]	295,151	36,845	81,829	**423,491**
Motorcycles	840,172	121,116	230,980	**1,216,118**
Tractors - Agriculture/Others	6,529	437	855	**7,977**
Trailers and Semi-Trailers - Agriculture/Others	6,890	402	834	**8,194**
Unclassified Vehicles[30]	1,006	108	129	**1,250**
Grand Total	**1,310,268**	**173,402**	**339,679**	

Gender and Transport

Transport Data Availability in Uganda

Data collection on transport in Uganda is erratic, incomplete, and rarely gender disaggregated. While the Uganda Bureau of Statistics (UBoS) has a Gender Statistics Portal, no gender-disaggregated information could be found on transportation needs, usage, or employment in the sector.[31] UBoS data on transport is instead limited primarily to road construction and water transportation.[32] MoWT requires formal requests to release data and does not de-register vehicles, meaning that the true

[28] Commercial vehicles or goods vehicles, light goods, medium goods, heavy goods, vans, prime movers, tractor heads.
[29] Saloons, estates, station wagons and sedan cars.
[30] e.g., Ambulances, Prisons vans, Hearses etc.
[31] Gender Statistics Portal; Retrieved from: http://gender.ubos.org:8080/demographics
[32] "2021 National Service Delivery Survey (NSDS): Transport Services," Uganda Bureau of Statistics, October 2022. Retrieved from: https://www.ubos.org/wp-content/uploads/2022/12/NSDS-2021-I-Transport.pdf

number of vehicles in the country is unclear. There is also no publicly available data on gender-disaggregated employment in government or public institutions.

Data collection by private institutions can be useful but is scarce, sporadic, and often inaccessible. Private sector companies including ride-hailing apps and asset financiers are known to collect data on boda boda drivers and users but don't release it publicly. The taxi sector is also owned primarily by difficult-to-identify individuals who remain reclusive. Reports by academics or those financed by major donors are therefore the most common data source. One area with good private sector data production has been on swap station locations: all three leading e-motorcycle companies provide publicly available maps of their swap stations, such as in Fig. 5. However, there is no gender-disaggregated information around swap station usage.

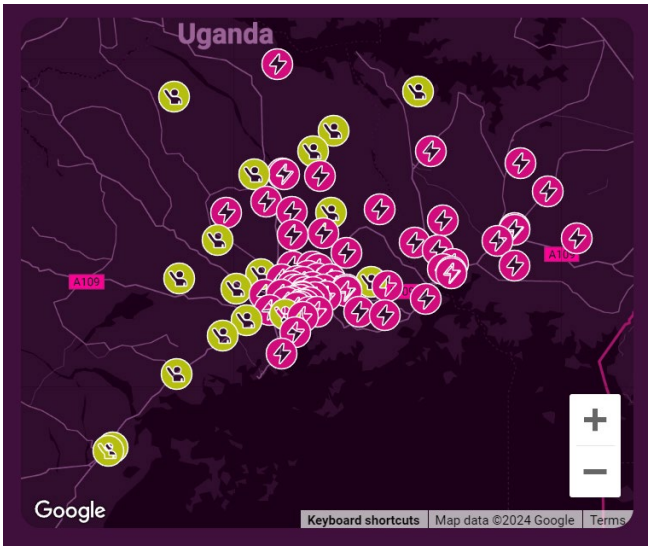

Figure 5 Gogo's swap station network, as available on gogo.co.com.

The only public, recurring source of data on public transportation in Uganda is the Lubyanza Quarterly Report on the country's boda boda sector, which nonetheless does not yet have a full data portal nor significant gender-segregated or passenger-centric data.[33] An unpublished WRI study from 2021 contains the most recent data on modal share by gender in Kampala.

The lack of gender-disaggregated data impedes informed policymaking, as policymakers do not have updated statistics on modal split and travel behaviours, meaning they are unaware which modes are preferred by women, why, for what trip types, or at what times. Partly as a result of this, mandatory provisions for pregnant women, free public restrooms or all-night lighting are missing from policy documents.

Just like state actors, private sector enterprises and NGOs seeking to close the gender gap in transport infrastructure also require accurate, recent, and relevant data to develop effective solutions. Recognizing that women often face harassment from other riders, for example, could help ride-hailing firms like SafeBoda to roll out programs discouraging sexual harassment and creating male allies amongst the boda boda community. Data is therefore a key tool across the transport spectrum and a more concerted effort by both donors and government to have regular gender-disaggregated data collection is necessary for any informed intervention.[34]

Gender and Transport Across Uganda

Uganda is a multi-ethnic country with diverse societal expectations for women and girls and this is particularly true in subnational regional norms around women and transport. In the cultures of Central and Western Uganda, gender norms tend to restrict women from riding bicycles or driving motorcycles. In the North, however, slightly less restrictive norms have created more space for women

[33] "Lubyanza Quarterly Reports," Lubyanza. Retrieved from: www.tomcourtright.com/lubyanza
[34] The following data is therefore based on a series of somewhat scattershot studies, and the most up to date data on gender-disaggregated modal share was thankfully shared by WRI.

on two-wheelers.[35] Concurrently, urbanisation tends to open up women's routes for increased mobility. In Fort Portal and Mbale, towns in Western and Eastern Uganda respectively, women's mobility in the villages surrounding the towns was considerably more restricted. Mbale women in particular were observed to be more mobile and higher users of boda bodas over those in Fort Portal. This is attributed to local cultural differences around gender roles in the economy, notably that women are strongly discouraged from riding motorcycles or bicycles in much of Central and Western Uganda but face less barriers in Northern Uganda.[36]

The transportation system in Kampala is costlier, both in terms of time (particularly as a result of traffic jams) and in cost. Women tend to slightly prioritise cost over time, while the opposite is true for men.[37] Women also tend to place a higher emphasis on comfort or security than men do when choosing which mode to travel with in Kampala, as shown in Fig. 6 below.

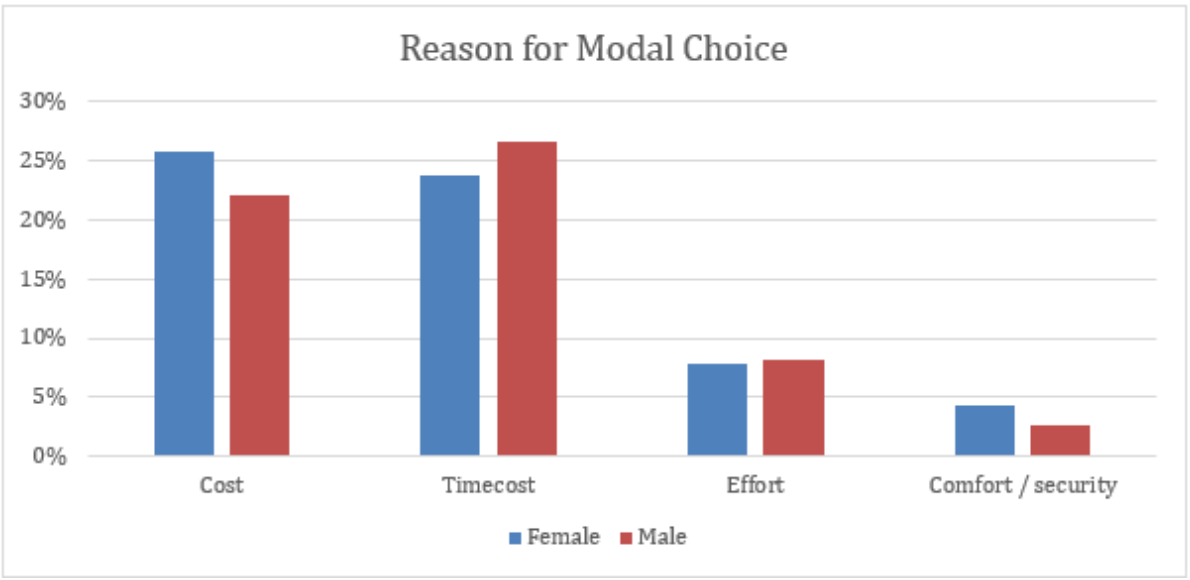

Figure 6 Stated reason for choosing reported transport modes. Source: Unpublished WRI survey.

Women as Passengers

Women's travel modes

In choosing travel modes, men and women in Kampala take a roughly similar combination of walking, boda bodas, and minibus-taxis. However, while around 35% of men's trips are by boda boda, boda bodas make up only 28% of women's trips in Kampala. Inversely, women make up a greater share of minibus-taxi trips at around 32% of trips compared to 25% of men's trips. There are multiple reasons for this: women may be more patient than men are, women tend to have higher financial demands at home and are also likely to be travelling with small children who would be safer inside a minibus than on a motorcycle.

[35] "Bicycles and Rural Women," by C M Calvo, 1994. Retrieved from: https://www.ssatp.org/sites/ssatp/files/publications/SSATP-WorkingPapers/WP12/part4.pdf
[36] "Moving in Growing Cities: Barriers to Accessibility in Fort Portal and Mbale," by Courtright, 2021. Retrieved from: https://deepblue.lib.umich.edu/bitstream/handle/2027.42/171067/RegionalCityTransportation_Final.pdf
[37] "Unpublished Kampala transport survey 2021," WRI.

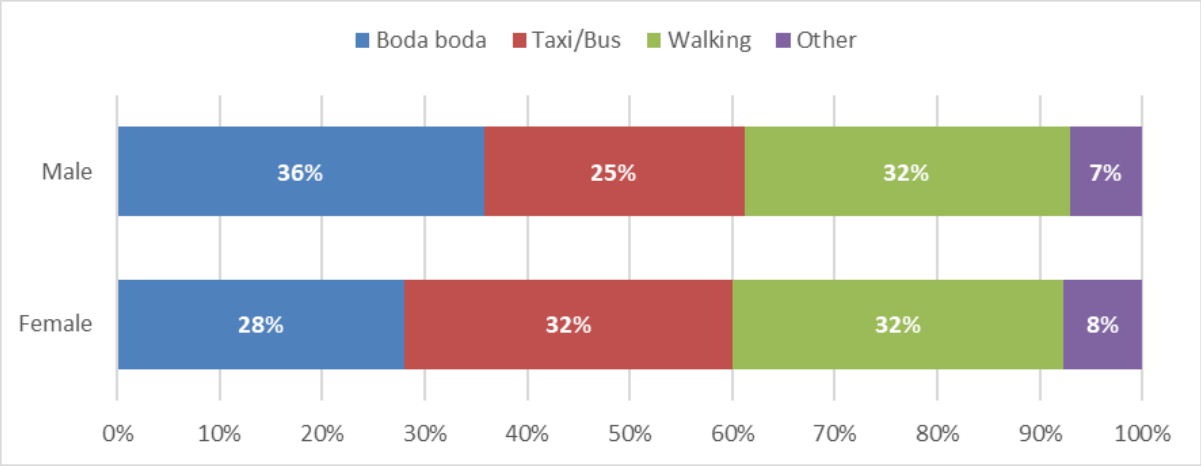

Figure 7 Travel mode by gender in Kampala, 2021. Source: Unpublished WRI survey.

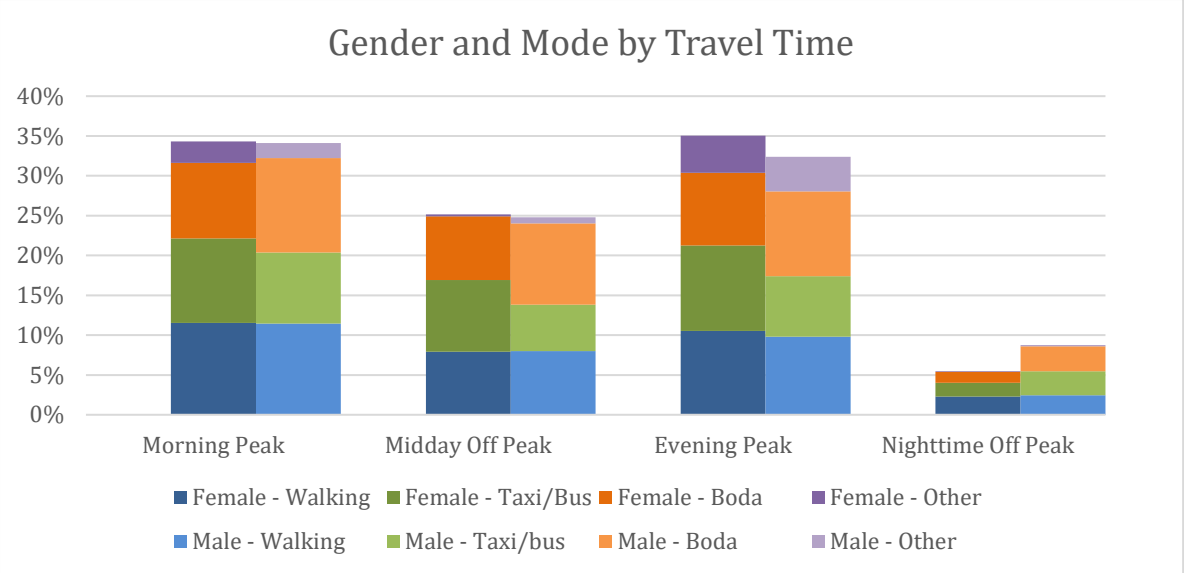

Figure 8 Travel mode by gender, mode and time in Kampala, 2021. Source: Unpublished WRI survey.

Gender and travel time

Travel in Kampala is also gendered in the times of day that people move, whereby women tend to head home earlier than men. This is because they tend to have more domestic responsibilities in the evening, especially taking care of children and preparing dinner. Additionally, Kampala has a lack of street lighting especially off main roads, creating a more dangerous nighttime environment for women. As a result, most women do not travel after dark – only 38% of nighttime trips are by women.[38]

[38] Unpublished WRI study

Women as Transport Operators

The transport system in Uganda is heavily male dominated. Men make up over 99% of boda boda riders and a similarly high proportion of minibus-taxi drivers and conductors. Though few studies could be found that break this down in detail, the National Census and Population Survey 2014 found that 98% of transport workers in Uganda were men.[39] In addition, the Census of Business Establishments in Uganda, conducted in 2011, indicates that the transportation industry, along with agriculture, fishing, storage and information and communication, had one of the lowest shares of female business owners compared to other industries in the country. While 10,653 men were employed in transport and storage, there were only 2,830 women documented in the same field.

> ***One male boda rider knocked me when I stopped at the traffic lights and he said, "why did you stop! Bodas don't stop at traffic lights!"***
>
> Namakula Valentina, woman e-boda rider

Women working in the sector report a wide range of obstacles, including male colleagues extorting them for sex and harassment from both other transport workers and passengers themselves.[40] Women working in the boda boda sector reported having to cover financial gaps created by their male relatives poor monetary habits, and claim women are better at saving and paying for key household expenses.[41] Men are considered to take higher risks and can pressure their female colleagues into similar risky road behavior. In addition, the mob violence that occasions the streets after road accidents is believed to be a mainly male-driven behavior, particularly by boda boda riders.[42]

A Woman Boda Rider
"We earn good money from boda jobs but men waste it," said Omutoni Gemima, a woman e-boda rider using the Zembo Storm. "For us women we save. For example, it's been two years since I started but I can now pay for my children's school fees and a lot has changed."

An App for Women's Taxicabs
Started in 2020, the Diva Taxi app provided women-driven taxicabs for women passengers to avoid the harassment common in the transport sector. Diva Taxi provided training in driving and self-defense skills, and recruited during the economic downturn of Covid-19. Reaching a fleet of 70 cabs by October 2020, they have since shut down operations, finding it difficult to break even in the notoriously unprofitable ride-hailing industry. However, several women continue to operate the cabs and work through referrals.

However, this is starting to change, particularly in Kampala. Anecdotal evidence indicates that more women are taking up jobs in this traditionally male-dominated industry. Rashid Sekindi Mugenyi, chairman of the Uganda Taxi Operators Federation, which represents public transport workers in Uganda, says it is now common to spot women in places like Kibuye Taxi Park working as drivers, conductors or guides.[43] Sekindi says that in the last few years, more women have registered with the

[39] "Gender Issues in Uganda: an analysis of gender-based violence, asset ownership and employment," Uganda Bureau of Statistics, March 2019. Retrieved from: https://www.ubos.org/wp-content/uploads/publications/03_2019UBOS_Gender_Issues_Report_2019.pdf
[40] "Kampala Paratransit Report," by Spooner et al, 2020; focus group discussion.
[41] Focus group discussions.
[42] Focus group discussions.
[43] A conductor collects fares from passengers and ensures that they're safely seated and that the vehicle is clean. A guide, also known as a tout, directs passengers to taxis in the park.

organisation. In total, the organisation now claims 30 women drivers (of 60,000 drivers) and 100 women conductors (of 40,000 conductors), with a recent uptick in membership. However, many women workers are believed to be unregistered, given the informal nature of the job, suggesting that the number of women in the industry could be higher.[44]

Women as Skilled Transport Workers

A small percentage of women form part of the cadre of skilled workers in the e-mobility space, where they have taken up positions as engineers, human resource officers, and other key roles. Women take up prominent positions like Projects and Development Manager, and Lead Lithium-Ion Engineer. Companies like Gogo have been proactive in hiring women engineers but, even there, only 27% of engineers are female.[45]

Women as Industry Leaders

Women are increasingly occupying leadership positions in the transport sector as a whole and e-mobility is no exception. For example, the Uganda Railway Corporation includes three women on their seven-person board.[46] Meanwhile, Uganda's Physical Planning Board has been chaired by a woman since 2021. As part of this report, we spoke with women working as chief technical officers, human resource managers and senior engineers in the e-mobility sector.[47]

These professionals acknowledged the small but growing number of women in the e-mobility landscape. However, a brief 2024 survey of fifteen women working in e-mobility in the GKMA indicates that they comprise only a small percentage of management positions across e-mobility companies in Uganda with none in a top management role.

[44] "Behind the Wheel with Uganda's Pioneering Women Drivers," Global Press Journal, 3 March 2024. Retrieved from: https://allafrica.com/stories/202403040088.html
[45] Interview with GOGO Electric, April 15, 2024.
[46] Uganda Railways Corporation website. Retrieved from: https://urc.go.ug/board-of-directors/
[47] Interviews with over twenty e-mobility stakeholders from Jan-April 2024.

E-Mobility in Uganda

Uganda's e-mobility ecosystem remains nascent, with eleven e-mobility startups operating across the two-wheeler, car and bus sectors. There are at 3,077 electric vehicles of which at least 3,000 are e-motorcycles as shown in Table 3 as of March 2024. While publicly known total investments in e-mobility companies operating in Uganda are over $165 million, over 95% of this has gone to just two companies – Spiro and Kiira Motors – while other companies have not released information on their raises.[48] E-mobility in Uganda is powered primarily by grid electricity, which is primarily from renewable sources and costs approximately 700 UGX per kWh, compared to petrol which is approximately 5,500 UGX per litre.[49]

Table 3 Comparison of ICE and EVs in Uganda. Source: MoWT (2023), STI (2023), and AfEMA (2024).

Type	ICE	EV
2&3W	1,300,000	3,000
Passenger cars	423,421	50
Buses (excl. minibuses)	25,124	27

The e-mobility ecosystem in Uganda includes EV assemblers, EV retailers, battery providers, charging infrastructure operators, electricity generators, electricity distributors and asset financiers. Additional key stakeholders include educators, trainers, researchers, policy makers and umbrella organisations like the Uganda E-Mobility Association.

Policies and Standards

International Policies

Uganda is a signatory of the 2015 Paris Agreement on climate change. As part of its commitment to the treaty, Uganda developed its Nationally Determined Contribution (NDC) to set baseline statistics for greenhouse gas emissions and goals for their reduction. Uganda's 2022 Updated NDCs increased the targeted reduction slightly from a 2030 business-as-usual case from 22% to 24.7%. One of the key mitigation measures is a switch to cleaner fuels, with electric boda bodas, electric buses and electric rail transport all receiving a specific mention.

Gender aspects of the climate change commitments, however, are not mentioned explicitly and little detail is offered on how e-mobility will be introduced. The 2022 NDC document states that Uganda looks to promote cleaner fuels and more fuel-efficient vehicle technologies, update transport regulations and implement measures to ensure compliance. Additionally, the NDC Scenario

[48] Interviews; AfEMA investment database.

[49] While a litre of petrol technically can be converted to 9 kWh of energy, petrol engines are much more inefficient - only around 20-40% of the chemical energy in a litre of petrol is converted to mechanical energy (movement on the road). Electric motorcycle models available in East Africa, for example, typically get around 25 km per kWh, compared to around 40 km per liter of petrol: a ratio of 1:1.6, rather than 1:9. This means that the kWh equivalent of a litre of petrol costs around 1,000 UGX, compared to 5,500 UGX for a litre of petrol.

specifically targets the introduction of 200 e-buses in Kampala, though other transport modes do not have specific targets.[50]

National Policies

Beginning with the President's address to the nation in July and August 2022, which emphasized that the economy should have made a full transition to electric vehicles by 2042, the government has begun rolling out incentives for electric vehicles and electric vehicle manufacturing. These are also backed up by the November 2023 **National E-mobility Strategy**. In pursuit of this, the Government of Uganda initially requested and obtained East African Community approval for import duty exemptions on a wide range of electric vehicle products and parts in the 2023/24 budget.

However, this incentive has been removed in the 2024/25 budget, which represents a significant shift towards an emphasis on local manufacturing. The 2024/25 budget removes the import duty exemption, returning the tax structure to a 10% rate on completely-knocked down (CKD) motorcycles and 25% on completely built units (CBU). Instead, the budget provides VAT-exemption for locally manufactured EVs, and exempts investors from income tax, stamp duty, and excise duty on investments in local EV manufacturing facilities and supplies.[51] Additionally, it exempts EV services, such as EV charging and battery swapping, from VAT.

The Science, Technology and Innovation Secretariat under the Office of the President has been mandated to develop a national e-mobility strategy, a draft of which was first completed in March 2023 and was then released in June 2024 (though dated to November 2023). This version is a fairly comprehensive policy package covering industry, research, innovation, energy, financing, planning and more. However, there was only a single mention that e-mobility should benefit all stakeholders regardless of gender (or other characteristics) and there are no specific policy measures to ensure that the e-mobility sector is gender-balanced or gender-transformative. Key measures and targets mentioned in the document are:

- 100% electric public transport and motorcycle stock by 2030
- 100% electric passenger car sales by 2040

It also sets out the following seven key priority areas, with the key proposed targets listed below:

Local EV Manufacturing & Supply	• **Installed production capacity of 500,000 vehicles per year by 2030** • **Up to 65% local content of key vehicle models produced in Uganda by 2030** • **At least USD 500 million mobilized for the e-mobility ecosystem by 2030.**
Local EV Battery Manufacturing	• Fully integrated domestic battery manufacturing value chain producing over 1 GWh

[50] "Updated Nationally Determined Contributions", Ministry of Water and Environment, 2022; p.39 & p42. https://unfccc.int/sites/default/files/NDC/2022-09/Updated%20NDC%20_Uganda_2022%20Final.pdf
[51] "Uganda Budget Brief, 2025/25," KPMG.

Public Transport	• At least 15,000 e-buses deployed for mass transit in Uganda by 2040 • Full electrification of motorcycles in the Greater Kampala Metropolitan Area by 2026 and the rest of the country by 2030.
Charging Network	• 3,500 public charging stations by 2040 • Increase electricity generation to provide up to 2,500 MW additional peak power
E-Mobility Human Capital Development	• All public universities offering programs addressing needs along the e-mobility value chain by 2030. • At least 250,000 people receiving specialized skilling along the value chain by 2040.
Electric Vehicle Uptake	• Full electrification of new government passenger vehicle, bus, and motorcycle fleet by 2035. • EVs to be 30% of vehicle sales in Uganda by 2030.
E-Mobility Standards Development	• Comprehensive standards, regulations, guidelines (*no date mentioned)*

Regarding gender mainstreaming in Uganda's national labour force, the Uganda Green Growth Development Strategy (UGGDS 2017/2018-2030/31) sets goals for women's share of the labour force in several subsectors, including transport and energy. For both sectors, the UGGDS is aiming for at least a 30% female labour participation rate by 2030/31.

Compared to its neighbours in Eastern and Southern Africa, Uganda has made reasonable progress in developing an enabling ecosystem for e-mobility as shown in Table 4. Uganda's publication of the National E-Mobility Strategy puts it with Rwanda ahead of all other neighbours in the region, and as of July 2024 Uganda provides incentives for local assembly and manufacturing and other fiscal incentives. However, it's removal of import duty exemptions for electric cars and buses has put it behind others, and the introduction of an EV-specific electricity tariff could yet provide an additional boost for the sector. Unfortunately, our review of regional policies indicates that while there are passing references to gender in some draft strategies, none have fully integrated gender considerations into their e-mobility policies.

Table 4 Comparative e-mobility policy in Uganda and neighbouring countries. Source: AfEMA research.

	Uganda	Kenya	Rwanda	Malawi	Ethiopia
E-Mobility Strategy or Policy[52]	✓		✓		
Import Incentives[53]		✓	✓	✓	✓
Assembly or Manufacturing Incentives	✓	✓	✓		
Fiscal Incentives	✓	✓	✓		✓
E-mobility Tariff		✓	✓		
Gender Integration in E-Mobility Planning					

Government Institutions

The Government of Uganda has shown increasing interest in e-mobility – particularly since mid-2022 – and has begun orienting ministries and institutions towards the sector's development.[54] However, they have yet to create a single national institution to guide the development of the sector.

The **Ministry of Works and Transport (MoWT)** is mandated to formulate policies, plans, set standards, build capacity, carry out advocacy, regulate, monitor and evaluate the Works and Transport sector. The Works and Transport Sector is a cluster of priority sectors of the economy comprising public building works, road, railway, water and air transport. The ministry is responsible for inspection of all ICE and electric vehicles in the country.

The **Science, Technology and Innovation Secretariat** (STI) is under the direct oversight of the President. The secretariat is mandated to lead the development of the e-mobility strategy and policy to guide the e-mobility ecosystem. Critically, STI published the National E-Mobility Strategy in June

[52] Both Kenya and Ethiopia have draft strategies that have not yet been published.
[53] Defined as import duty exemptions on completely built units (CBUs) of EVs *or* VAT exemptions that include CBU EVs.
[54] "Museveni hails e-mobility group as Uganda turns to clean energy," New Vision, 20 September 2022. Retrieved from: https://www.newvision.co.ug/category/news/museveni-hails-e-mobility-group-as-uganda-tur-143468

2024, a comprehensive document that is described above. The secretariat generally works closely with Kiira Motors and other Ministries – particularly the Ministry of Energy and Mineral Development and the Ministry of Works and Transport - to build the EV ecosystem, acting as a coordinating body.

The **Ministry of Energy and Mineral Development (MEMD)** manages utilisation of energy and mineral resources for development of Uganda and its people. The Ministry is concerned with matters such as energy policy, investments in mining and the establishment of new power-generating infrastructure using hydro, thermal, solar and nuclear power.[55] The growth of electric vehicles is expected to eventually require an expansion in electricity generation in Uganda, which the MEMD will be needed to facilitate. In order to address this, 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.

The **Ministry of Finance, Planning and Economic Development (MoFPED)** has a wide mandate to formulate economic and fiscal policies and guide the evolution of the Ugandan economy, including developing the central government's budget. As a result, fiscal policies to support the e-mobility sector – such as the removal of certain taxes or granting of corporate tax breaks – must come from the MoFPED.

E-mobility Companies in Uganda

Kiira Motors is a privately incorporated company co-owned by the Government of Uganda and Makerere University, primarily producing electric and ICE buses, although it previously also produced an electric car. Kiira Motors started in 2007 as a research project in Makerere University, Uganda, and is now majority owned by the Government of Uganda. After developing the first African-designed electric bus, which was launched in 2015, Kiira began assembling the Kayoola EV, another electric bus model, in 2020, and has 27 e-buses registered in the country. No gender-disaggregated workforce data was made available.

Zembo first introduced e-motorcycles to Uganda's boda-boda sector in 2018 and has since deployed over 400 e-motorcycles serviced by 27 charging stations, including both grid-connected and hybrid grid-solar stations. Vehicle components are imported from China and assembled in Uganda. The e-motorcycles are then sold to boda-boda drivers on a lease-to-own basis, whereby the swappable batteries are recharged and owned by Zembo. The company's newest model, the Zembo Thunder, is in partnership with local manufacturer Simba Motors, and is increasing the share of local value addition. As of May 2024, Zembo had 25 female boda boda riders of a fleet of around 450 (5.5%). Of the 86 full-time employees at Zembo, 29% are women. The senior leadership team however is all male.

[55] Currently the two largest power development projects in the country are the 183MW Isimba Power Station, online since 2016 and the 600MW Karuma Power Station, online since 2018.

Spiro was founded in 2019 through a partnership with an Indian e-tuktuk manufacturer known as M-Auto and split off to rebrand as Spiro in 2022. Backed financially by the Africa Transformation and Industrialization Fund, Spiro has raised over USD $120 million including USD $60 million from Société General, backed by GuarantCo.[56] Currently building manufacturing and assembling facilities linked to the parent company Arise IIP, it has begun by importing completely built units (CBU) of motorcycles. It has developed around twenty swap stations across Kampala. While Uganda-specific statistics were not available, women make up 36% of Spiro's total workforce.

GoGo is the brand name for **Bodawerk's** electric motorcycle and battery swapping network. Founded in 2017, Bodawerk focused on battery pack assembly and refurbishing for off-grid settings before shifting to the urban motorcycle market with an investment from Watu in 2023. Bodawerk assembles lithium-ion batteries and electric motorcycles in Kampala. Boda boda riders swap batteries at one of their more than sixty swap stations (as of January 2024). Watu, an asset financing company, is a major investor and provides leasing for the motorcycles. It has operations in the Central and Eastern regions and over 1,000 electric motorcycles on the road in Uganda as of January 2024. In terms of gender composition, 30% of the workforce is female, and six of seven senior management positions are filled by men.

Soleil Power was founded in 2022 and is building a production-scale lithium-ion battery assembly plant to serve the growing demand for stationary energy storage and e-mobility battery solutions. Soleil Power designs battery management systems in-house to ensure they deliver the features customers need. Soleil's workforce has eight full-time staff, of which 50% are women.

Karaa Africa is an electric bicycle company. Karaa is focused on providing sustainable and cost-effective transportation solutions for delivering goods and packages in Africa. The electric delivery bicycle is designed to meet the needs of small businesses and fleets, and to provide a reliable and cost-effective alternative to traditional delivery methods. The company has a team of three staff, with two men and a woman serving as chief technology officer.

[56] "West Africa: Société Générale Announces $60M Loan to E-Bike Seller Spiro," Ecofin Agency, 9 August 2023. Retrieved from: https://www.ecofinagency.com/finance/0908-44782-west-africa-societe-generale-announces-60m-loan-to-e-bike-seller-spiro

Modjo Energies is an early-stage company that converts petrol-powered motorcycles into electric motorcycles. Modjo also conducts training for engineers and research into electric mobility solutions. The company is run by three male directors and has no other full-time employees.

Greenhub East Africa is an innovation hub developed with Kjaer Group, Nexus Green and Motorcare working to deliver electric scooters and motorcycles. It aims to package several benefits for drivers, including increased incomes, safer working conditions, and sustainable waste management. Greenhub East Africa is currently piloting TVS iQube electric scooters with women delivery drivers. As of July 2024, Greenhub was employing three permanent staff, of which one was a woman.

Drive Electric is a subsidiary of Knights Energy, a renewable energy solutions provider incorporated in Uganda and Kenya. Drive Electric is the e-mobility division of Knights Energy and has already rolled out EV charging stations in Kenya for four-wheelers. Knights Energy has also installed solar photovoltaics atop Total petrol stations throughout Uganda and plans to leverage this relationship to install EV chargers at Total stations but have not yet installed any in Uganda.

eBee is an e-bicycle company operating in Uganda, Kenya and Rwanda. eBee does both direct retail sales of its e-bicycles and manages a fleet of delivery e-bicycles, connecting them to online delivery services like Glovo and providing financing for riders to eventually own their own bicycles. In Uganda, eBee's workforce of 12 is 44% female, while its fleet of riders is 5% female.

MotorCare Uganda is the authorized dealer for Nissan, Ford, and Hyundai in Uganda. MotorCare retails and maintains passenger cars, including pickups. MotorCare was retailing electric vehicles from around May 2023 until the introduction of the Finance Act 2024/25, which reintroduced import duty on imported electric vehicles and led to MotorCare shutting down it's EV sales department. MotorCare's workforce in Uganda is 30% female out of 59 employees.

Potential for industry development

Currently Uganda imports nearly all of its vehicles, including motorcycles, cars, buses and trucks. Motorcycles are usually imported as disassembled parts from India or China and are locally assembled. This provides some limited job opportunities – a motorcycle can take around half a workman-day to assemble – with some limited local parts manufacturing. Cars and minibuses are imported as used and completely assembled units, most commonly from Japan, while larger coaches and trucks are typically imported new and completely assembled from China.

While the entire 1.8-million-vehicle fleet in Uganda has the potential to transition to electric with current technologies, it will be a staggered transition as costs, usage and available financing will mean certain segments will take significantly longer to do so.[57] In particular, vehicles used for commercial purposes will be relatively quick to transition, due to high usage and thus faster payback on the original investment, while smaller-format vehicles will be easier to electrify due to lower capital needs. In turn, larger vehicles and those for personal use will take significant capital investments and time to transition.[58]

Currently, both Zembo and Gogo are manufacturing certain motorcycle parts in Uganda, while Gogo is also assembling batteries with a proprietary battery management system (BMS).[59]

WoW and SOL+: electrifying women's rides

Under the Women on Wheels (WOW) program, Zembo and Women Rising for Africa, with funding from SOLUTIONSplus (SOL+), undertook four weeks of intensive training of women in motorcycle riding, first aid, financial literacy, gender-based violence and family planning.

Overall, 25 women were trained and provided with subsidised electric motorcycles. Since the training, the women have driven more than 200,000 km and avoided 10 tons of CO2. Additionally, the newly minted operators have each saved an estimated additional 90,000 UGX monthly, compared to if they had used ICE motorcycles.

The Two-Wheeler Opportunity

As the number of ICE boda bodas continues to grow, their impact on GHG emissions and air pollution increase in parallel. Fortunately, electric motorcycles are among the cheapest electric vehicle technologies, due to their small batteries and long years of development in China. But they still cost more than their fossil-fuelled alternatives: The cost of a motorcycle with a battery large enough to

[57] "Global EV Outlook 2024," International Energy Agency, 2024. Retrieved from: https://www.iea.org/reports/global-ev-outlook-2024

[58] "Power to Move: Accelerating the electric transport transition in sub-Saharan Africa," McKinsey, 2022. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/power-to-move-accelerating-the-electric-transport-transition-in-sub-saharan-africa#/

[59] Zembo is doing so through its partnership with Simba, a local automotive manufacturer.

serve a full day of taxi operations assuming around 125 km/day – at least 5 kWh capacity – remains 50-100% more expensive than an equivalent ICE motorcycle.[60]

In order to deal with this disparity, e-motorcycle companies like Gogo, Zembo and Spiro split the motorcycle and the battery, retaining ownership over the battery and providing battery swapping services while selling the motorcycle on its own. This is common among electric two-wheeler companies throughout Africa, the majority of which have adopted the battery swapping model. While in the future the falling costs of batteries or potential strengthening of the Ugandan economy may allow for batteries bundled and sold together with motorcycles, this arrangement would require at-home plugs or faster public charge points as are being developed and standardised in India.[61]

Figure 9 Spiro battery swap station. Credit: Tom Courtright.

E-motorcycle companies have raised their funding from a mixture of grant, equity, and debt financing, but estimate that they need several hundred million dollars in private-sector financing to transition the entire industry.[62] The introduction of e-motorcycles from established ICE manufacturers such as Bajaj, TVS or Hero would thus be a major development and could provide a significant boost to the share of e-motorcycles on the roads. While they have yet to enter the market with e-motorcycles fit

[60] "Global Emerging Market Overview for Electric Two and Three wheelers," UNEP, January 10, 2024.
[61] "Towards Standardization of DC Charging for Light E-Vehicles," EV Reporter, April 8, 2024. Retrieved from: https://evreporter.com/towards-standardization-of-dc-charging-for-light-e-vehicles/
[62] Interview with industry figures.

for the boda boda sector, TVS has begun to deploy a limited number of its iQube scooters for women riders with Greenhub East Africa and further deployments may be coming soon.[63] The entry of these manufacturers could have a significant impact on the local industry as they have both deeper pockets and decades more of experience, but it's unclear what that would mean for the gender composition of the market.

Passenger Cars and Light Goods Vehicles

The electric car segment in Uganda is underdeveloped, with no known retailers of electric cars since the termination of Motorcare's EV retailing, although a handful of enthusiasts have imported their own. While Motorcare was able to sell around 30 EVs between June 2023 to June 2024, the introduction of the Finance Act 2024/25 which reintroduced import duties on EVs led them to shut down retail sales of EVs. [64] Experience from neighbouring Kenya indicates that a combination of used EVs and affordable new Chinese EVs will be necessary for electric cars to compete credibly with the price point of the currently dominant used ICE car market.

Electric Buses

Globally, the electric bus segment has been boosted by significant research and development and government-subsidised public bus services – all of which are in short supply in Uganda. In addition, the global focus for electric bus development has centred on the 30-70 seater range, at the expense of the 14-seater minibus category currently dominant in urban bus services in Uganda.

Figure 10 A Kiira electric bus on the road in Kampala. Credit: Tom Courtright.

So far, Kiira Motors is the only provider of electric buses in the country. Kiira Motors began as a student project at Makerere University and resulted in the first African-designed and African-built e-bus in 2014.[65] It subsequently changed to a Chinese-designed vehicle body and named the new model the Kayoola EVS, with a seating capacity of 90 and range of 300 km.[66] Kiira received significant government funding and has since ventured into assembling ICE buses as well.

As the majority of buses in Uganda are 14-seat minibuses, it remains to be seen if Kiira's full-sized vehicles will find their niche in the local market, or if Uganda will soon see the entry of competing imports, such as the e-minibuses currently undergoing testing in South Africa and Southeast Asia.

[63] Interview with Greenhub East Africa.
[64] Interview with Motorcare.
[65] Interview with ex-Kiira Motors employee and Makerere student.
[66] Kiira Motors website. Retrieved from: https://www.kiiramotors.com/kayoola-evs/

Industry Benefits

Increased domestic value addition. Currently, the Ugandan economy is heavily reliant on resource extractive activities, agriculture and a smattering of low-paid services, with limited industrialization. E-mobility can be an anchor industry in Uganda, boosting the economy through domestic value addition. Local parts manufacturing creates demand for higher-quality steel and processed materials, stimulating the economy as a whole.

Enhanced carbon neutrality. The electricity grid in Uganda is over 90% clean, with a heavy emphasis on hydroelectricity. As a result, transitioning from ICE to electric vehicles provides a significant reduction in CO2 emissions.

Increased income and savings. Uganda's nascent e-mobility sector offers employment opportunities, both directly by the participating startups and via self-employment among riders. On average, boda boda riders in Uganda earn around 41,800 UGX (USD $11) a day, taking home between 9,000 to 20,000 UGX (USD $2.3 to $5.3). This range varies depending on ownership, luck, location and work style.[67] Fuel consumes around 13,600 UGX (USD $3.6), or 32% of a rider's gross income. Transitioning to electricity, which is around 5 times cheaper than fuel, thus will reduce costs and improve net earnings for drivers. Electric vehicles also have fewer moving parts and require less maintenance, meaning less money is spent on maintenance and fewer hours of repair-related downtime rendering drivers unable to work. Both further boost earning potential for operators who make the switch to EVs.

> ***"The life of my family changed completely. There is access to daily income and savings. I am sure of money every day. I cannot even think of any office job. I will be driving my car in the next 5 years. I save 50,000 UGX ($13.2) per day. I am taking my children to better schools and I can afford a better life now. I am so happy."***
>
> *Akulu Roscovia, a female e-boda rider trained through the Women on Wheels program.*

Reduced dependence on imported fuels. This can have a major positive impact on Uganda's energy security and fiscal budget. Currently, Uganda spends around USD $1.6 billion on imported petroleum products.[68] This represents a strong dependency on foreign markets, money lost to the domestic economy and a drain on Uganda's foreign exchange, which must then be balanced with increased exports. By consuming locally generated electricity instead, there is a significant opportunity to increase economic self-reliance.

New job opportunities and a new, modern industry. Establishing an e-mobility ecosystem creates job opportunities in manufacturing, maintenance, charging infrastructure development and related services. A properly harnessed e-mobility sector can serve as an anchor industry in Uganda, capable of helping to transform the economy through industrialization, job creation, domestic value addition and the provision of quality products and services.

[67] Lubyanza Quarterly Reports. Available at: tomcourtright.com/lubyanza
[68] "Uganda in talks to import all its oil via Tanzania," The East African, February 15 2024. Retrieved from: https://www.theeastafrican.co.ke/tea/business/-uganda-in-talks-to-import-all-its-oil-via-tanzania-4526038

Women in E-Mobility in Uganda

So far, there is little data on the preferences, roles, or experiences of women in the e-mobility sector in Uganda. It is unknown, for example, if there are EV design choices preferred by women (as has been found in Kenya). [69] However, our research and the focus group held in August 2024 revealed some key insights into how women boda boda riders in Uganda view e-mobility, and a few key data points from interviews can help us get a basic understanding of the state of women's representation in the e-mobility sector.

Women in the EV Industry

0	female **CEOs or founders**
29-44%	female **workforces** in e-mobility companies
2.3%	female **e-boda riders**

From conversations with women in the industry and a few data points shared by e-mobility companies, women remain under-represented in the e-mobility sector in Uganda. Of the country's 12 known e-mobility companies, none of them have female founders or CEOs.[70] This is consistent with the overall lack of women entrepreneurs and leaders in the sector across Africa: only 8 out of 105 EV companies (7.6%) with identifiable management had a woman founder or CEO.[71]

Women Operators

While there is little sign that women are organically joining the e-mobility sector as operators in significant numbers, a few women have embraced e-mobility through targeted programs. Key among them has been Women on Wheels (WOW), under the Spanish NGO Women Rising for Africa, which has partnered with e-mobility companies to finance and train women to become boda riders. In 2023, WoW partnered with Zembo, with funding from the SOLUTIONSplus project to finance and train 25 women to use electric motorcycles as boda boda drivers. Since the training, more than 200,000 km were driven, up to 90,000 ($23.7) UGX was saved monthly per beneficiary and 10 tons of CO2 were avoided through the program.[72] WoW has also recently completed a training of thirteen women e-scooter riders with Greenhub East Africa (GHEA), who have joined delivery and ride-hailing apps as drivers.[73] The women trained by these two initiatives alone may account for roughly 2.3% of riders in Uganda's total electric two-wheeler fleet.[74]

Women using the GHEA e-scooter, a TVS iQube scooter, expressed appreciation for its capabilities, claiming they could move as fast as the most common ICE model in Uganda – a common concern for ICE riders considering moving over to an electric model. Both men and women riders complained of early product issues with some of the e-motorcycles on the market, including throttles that would short-circuit when wet and under-performing batteries, but noted that on the whole problems had reduced and offerings had improved.

[69] "Integrating Women in the Uptake of Electric Mobility in the Two- and Three-Wheeler Sector," by Flone Initiative, 2022.
[70] Internal AfEMA Database.
[71] Internal AfEMA Database.
[72] "Women on (electric) wheels, Gender and E-Mobility Workshop," by Ferron and Felix, 31st January 2024. Presented at the Sheraton Kampala.
[73] Interview with Felix Muchiri, April 2024.
[74] This is based on there being 38 woman riders of around 1,650 e-boda riders.

The e-scooter in particular resulted in a different experience for women riders. Women who were using the e-scooters were also provided with chargers, in contrast to all of the other electric two-wheelers on offer in Uganda, and reported greater savings as charging is cheaper than battery swapping. Conversely, they reported higher costs for the vehicle itself, which in this case was allayed by the programmatic subsidies.[75]

> ***"Stations for our scooters are free. You go there, put your charger in and wait. You can be on tiktok as you wait for your battery to get fully charged. Also handling matters but most men are bad handlers. If mine was being used by a man, it would really look bad already." – Namakula Valentina, e-scooter driver.***

An additional, somewhat unexpected benefit of using e-motorcycles was reported: much lower theft, which is a widespread and dangerous problem for motorcycle riders in Uganda.[76] As the number of e-motorcycles remains low, thieves tend not to know how to operate them, much less charge them or swap their batteries (and companies have safeguards against unregistered users swapping them), and thus avoid them. One respondent described leaving her e-motorcycle out on the street overnight, which would be unthinkable for an ICE motorcycle user, and not having anyone steal it. Another, a woman whose husband is also an e-motorcycle user, described a time a thief tried to steal her husband's motorcycle, was unable to operate it, and ultimately abandoned it. While thieves will undoubtedly gain the knowledge to operate electric vehicles, the battery swapping experience provides a safeguard as most companies require riders to present an ID, and there is thus the potential for a long-term decline in motorcycle theft in Uganda.[77] This will have an outsized benefit for women, who report safety as one of their top concerns when joining the boda boda sector.[78]

[75] Focus group discussion.
[76] "Of Mechanics and Yangas," Geofrey Ndhogezi, April 2024, *Lubyanza.* Retrieved from: https://medium.com/lubyanza/of-mechanics-and-yangas-d4016109999e
[77] Interviews with e-motorcycle companies in Uganda.
[78] Focus group discussion.

Story of a female boda boda rider, using the SafeBoda app

Aged 36 years old in 2024, I began my journey as a Uganda People's Defence Force (UPDF) soldier where I witnessed a number of cases of sexual harassment of women by male bosses in the UPDF. I got tired of working for very little pay and got a job as an independent security officer guarding Aponye Mall in Kampala.

As I was working at the Mall, a female boda rider came to deliver a parcel. She was disturbed by male security guards trying to get the parking space. She came to me for help and, after I helped her, I asked her where I could get a boda boda for riding. I was inspired by her smartness in dressing and she introduced me to the Spanish organisation called Women Rising for Africa. Under the WOW programme, I received one month intensive training in riding, self-defence, financial literacy, communication and many other skills. Later, I was given a motorcycle for riding, which I pay for in instalments and will own outright in under two years. We were also connected to SafeBoda, which connects many deliveries to female riders, helping us make money. I am able to save more money and expand my social network through corporate friends and clients.

The main challenge is bullying by male riders that threatens my confidence. Also, using the SafeBoda app during night hours is challenging, as clients often cancel orders once they see I am a woman. In addition, most roadside clients tend not to request my services after seeing my name on the reflector jacket. Some of the other women I trained with received the EV and gave them out to their husbands, but I am the only one who rides my own as boda boda.

From my experience, I recognize the importance of seeking support and guidance from my networks. I always speak out to women and men about the advantages of employment as a motorcycle rider. I am grateful for my fellow female riders, some of whom have become experts and moved on to better jobs. I have talked to women and told them to join as riders, since they can make many parcel deliveries using the Safeboda app rather than just relying on transporting passengers.

Challenges for Women in E-Mobility in Uganda

Despite the identified potential, e-mobility faces a number of challenges in Uganda. Some of the following apply to e-mobility generally and some are specific to the prospect of women getting more involved in the sector. These challenges span the realms of policy, society, and infrastructure.

Policy

Lack of a legal, policy and institutional framework reduces investor confidence in the sector. The draft e-mobility strategy drawn up in March 2023 is gender-blind: There are not yet any gender-sensitive policies, or even recognition of the need for such policies, which could, for example, require sufficient lighting at all charging and battery swapping stations.

Limited government support for lowering the cost of EVs. While the import duty exemptions are welcomed, excise duties and value-added taxes remain on electric vehicle parts and imports. Women

in Uganda tend to be more price-sensitive and are often unwilling to accept the high interest rates offered by local vehicle financing firms. Government support for women's cooperatives to purchase EVs could thus help lower this barrier to women's involvement.[79]

Limited relevant operational and electrical skills are another challenge to Uganda's electric vehicle transition. Discussions with industry and government stakeholders have unveiled a mismatch between the skills present in the market and those essential for local EV assembly and manufacturing, particularly among women. This discrepancy stems from a lack of curriculum alignment in training institutions with industry demands as well as limited information, knowledge and skills on the transition away from ICEs that is underway globally. These issues are exacerbated for women, who face a variety of challenges in the STEM sector in Uganda, where women engineers are relatively rare. There are also no public databases that help connect skilled people to relevant employment opportunities.

Limited availability of gender-disaggregated mobility data. Fleet statistics typically come from two sources: importations and registrations. Importation statistics come from the Uganda Revenue Authority and are rarely made public. They only include the numbers of vehicles legally imported into the country, missing vehicles that are imported extra-legally, those that are never sold, or those that spend a long time in warehouses. Most importantly, this data does not reflect vehicles taken off the road, requiring average vehicle life spans to be used to estimate the on-road fleet at any given time. On the other hand, registered vehicle statistics come from the Ministry of Works and Transport and, similarly, are rarely shared publicly. Motorcycles in particular often escape the registration process and as mentioned previously there is no de-registration process in place. Most organisations have some capacity to collect data on sales and the like, yet it remains limited and rarely disseminated for public consumption. Finally, there is no established centralised database for sharing data and information among the e-mobility stakeholders.

Society

Women have significant family responsibilities in Uganda, making maintaining work-life balance and navigating family responsibilities difficult. This, coupled with inflexible work schedules, the need to travel far from home, and a lack of childcare support, creates additional hurdles for women aiming to enter the e-mobility and transport space.

Gender roles around employment portray most transport jobs as 'unsuitable' for women, leading to unconscious bias in hiring and career progression. Gender bias manifests in various forms, from subtle microaggressions to overt discrimination, especially in the hiring process. This can include being underestimated or facing scepticism about one's technical abilities solely based on gender. Additionally, some employers view young women as unreliable due to their potential to take maternity leave. Employers may see this as a significant work gap for the time that has been taken off and may either prefer to hire a male for the role or simply fire pregnant women.

Rejection and discrimination by clients towards women transport workers is widespread. Women transport workers often face passenger bias, which can prevent them from getting the best out of their jobs. Some passengers are reluctant to ride with a female driver, or may pay them less than their male counterparts. This makes it difficult for women relying on transport work to make ends meet.

[79] "Barriers to Mobility in Regional Towns in Uganda," by Courtright

Sexual harassment by male clients, employers and colleagues is sadly common. Half of all women in Kampala report experiencing verbal or other forms of abuse.[80] This is a widespread issue that leads to women dropping out of the transport sector, limit their movements and can cause long-term dissatisfaction and trauma.

Limited female role models in the sector make it difficult for early-career women to aspire to work in the sector, learn and grow. Professional networks and mentors who understand the unique challenges faced by women in transport and e-mobility do not exist currently.

Infrastructure & Capital

High electricity tariffs can account for up to 45% of operational costs, despite being relatively cheaper than fuel, limiting profitability and thus long-term sustainability.[81] This is worsened by an independent electricity meter for each swap station, which makes it difficult to get access to more favourable tariffs despite high aggregate demand.

Limited charging infrastructure reduces the reach of electric vehicles. Currently, there is no public charging infrastructure beyond four identified EV charging stations in Kampala. The majority of private installations consist of motorcycle battery swap stations owned by the three leading companies.[82] This means that e-motorcycle riders sometimes have to ride long distances to access swap stations. In addition, most swap stations close at 11:00 PM and open at 6:00 AM, increasing insecurity during nighttime riding – when 80% of women in Kampala report feeling insecure while travelling at night.[83]

Unreliable or insufficient electricity supply encourages the concentration of EV infrastructure in well-served urban areas. This will slow the rollout of e-mobility in rural areas where most women live and increase the cost of deployment by requiring solar or other decentralized electricity generation at the site of charging.

High capital requirements for e-mobility companies are likely to slow the overall transition. An electric motorcycle and accompanying batteries can cost around USD $3,000 to $4,000, while electric buses are often over USD $150,000. This requires e-mobility companies to raise millions of dollars in order to put a significant number of vehicles on the road.

Limited range and battery technology: Concerns about limited driving range and the lifespan of batteries discourages potential buyers, affecting the acceptance of EVs. This remains an issue despite rapidly dropping battery prices.

[80] "Statistical Evidence of Women's Use and Experience of Public Transport in Kampala," UN Women.
[81] Interview with e-mobility companies, February 2024.
[82] Interview with Motorcare, August 2024.
[83] Additionally, Half of all women in Kampala report experiencing verbal or other forms of abuse. From "Statistical Evidence of Women's Use and Experience of Public Transport in Kampala," UN Women.

Opportunities

Despite the many challenges, there are several opportunities for e-mobility to be gender-transformative in Uganda.

> ***"Women have been historically disadvantaged in accessing jobs in different sectors, and that same pattern seems to be continuing even in the e-mobility sector and there is a need to break this pattern. At eBee, gender inclusion is at the core of our business ethos, and we are challenging the status quo and bringing women in the e-mobility space as mechanics, electric bicycles users and in management positions."***
>
> ***– Hakim Owiny, eBee***

Building a new industry. The creation of new organisations, new jobs and a whole new sector present an opportunity to break with the past. New enterprises can set higher standards for women's representation and gender-inclusive services, in order to leave as much of the rampant sexism in the past as possible. Women are often considered to be better drivers than men in Uganda, which could provide more demand for women riders on the road and help improve women's share of jobs in the transport industry.[84]

Electric vehicles can be a better fit for women. They are simpler to use as they have no gears. In addition, the most advanced and prevalent electric two-wheelers globally are scooters, which are lighter and better designed for women.

Favourable corporate culture among current e-mobility players. Companies like Gogo, Zembo and Soleil Power all have women in middle management positions – though not yet in senior leadership – and non-discrimination policies to support women are in place.

Financing for women riders. In the boda boda sector, there are opportunities for financing women's motorcycles from asset financiers that could offer lower interest rates for EVs. This can help women avoid the men who often own and rent out the vehicles and might otherwise gatekeep the access to vehicles.

Figure 11 Gogo's electric boda manufacturing plant. Credit: Tom Courtright.

Awareness of opportunities. Many women are simply unaware of the potential opportunities in the e-mobility sector. Heightened visibility of women in the sector, boosted by media interest in e-mobility, can increase women's participation in the sector.

[84] Focus group discussion.

Conclusions and Recommendations

The e-mobility transition has great potential to drive Uganda's development, reach government objectives and improve quality of life for Ugandans through reduced air pollution and improved economic outcomes. Including women in this subsector can break down barriers for women across the transportation and energy sectors at large and ensure equitable distribution of benefits from the e-mobility transition. But realising this potential will require vastly improved data availability and public policies. There is growing capacity to collect disaggregated data at the national level and at the level of individual companies[85]. So far, this data has remained in the hands of private sector actors and a handful of government agencies, with no coordinated or consistent publication of related data. In addition, e-mobility in Uganda faces an unclear policy environment, significant unmet capital demands and ongoing social barriers for women to join the sector.

We therefore recommend the following to expand the e-mobility sector and making the sector more inclusive for women:

1. Reduce electricity tariffs or undertake volumetric metering, allowing e-mobility companies to bundle electricity demand from multiple charging or swapping stations to access industrial tariff rates.
2. Expand the provision of e-mobility data to bring transparency to government planners, e-mobility startups, investors and donors looking to support the sector.
3. Strengthen the electricity network, easing the construction of charging stations in rural and peri-urban areas providing access to e-mobility outside of Kampala.
4. Implement the national e-mobility strategy, providing stability and long-term planning confidence for donors and investors in the sector.
5. Provide financial incentives for electric vehicles and charging infrastructure, using time-limited tax exemptions to boost the nascent industry through savings for consumers.
6. Establish specifications and standards through Uganda's National Bureau of Standards for electric vehicles and charging infrastructure to ensure product quality.
7. Increase information among the general public and women especially on the benefits, projected outcomes, impact, process, opportunities and methods of the e-mobility transition.

In order to boost gender mainstreaming in the e-mobility sector in Uganda, six key measures should be taken by the responsible stakeholders:

1. Stop sexual harassment by male clients and employers, reducing discomfort and insecurity for female workers.
2. Address gender biases which reduce women's opportunities to work and progress in their careers.
3. Boost STEM programs for women and establish a database of skilled female workers for employment in the Ev industry.

[85] Interview with UNBS, September 8, 2024. Additionally, there are increasing numbers of open-source tools such as Google Maps, KoBoCollect and more that allow both public and private actors to collect and visualize data.

4. Increase the visibility of female role models in the sector to provide mentorship and examples for women looking to enter the sector.
5. Improve sensitivity to issues around gender roles, such as ensuring flexible work conditions for pregnant and nursing women.
6. Strengthen gender-disaggregated data collection in the e-mobility sector, with an eye toward tracking women's representation as operators and employees.

These can be taken up as policy and through pilot projects showcase how to include women in e-mobility. Taken together, these recommendations can accelerate the rollout of e-mobility in Uganda and ensure that women are fully included in the development of the industry, setting them up as owners, workers, leaders and beneficiaries of a more just and clean transportation system.

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Annexes

Appendix 1: List of Interviews

S/N	Name	Designation	Organisation
	Females		
1	Thatcher M. Nakimuli	Principal Program Officer	Science, Technology & Innovation Secretariat
2	Winfred Naluyinda	Assistant Commissioner Mechanical Inspection	Ministry of Works and Transport
3	Immaculate Nyamaizi	Vehicle Inspector	Ministry of Works and Transport
4	Elissa Ferron	Finance Manager	Zembo
5	Moreen Nakigudde	Human Resource/ Administrative Manager	Zembo
6	Bridget Gwokyalya	Station Attendant	Zembo
7	Moa Rydell	Chief Strategy Officer	Greenhub Kampala
8	Nalukwago Maureen	Deployment Supervisor	Spiro (AGM Solutions Uganda Ltd)
9	Roscovia Akulu	Bodaboda Rider/WOW	Women rising for Africa
10	Pauline Cyiza	Senior Energy And Market Manager	Ayuda en Accion
11	Betty Kasabbiti	Programme Manager	Women Rising for Africa
12	Jamila Mayanja	Chief Executive Officer	Smart Girls Foundation- Uganda
13	Laura Corcoran	Director	Soleil Power
14	Maureen Namanya	Lithium-ion Battery Engineer	Soleil Power
15	Claire Birungi	Transport Systems country manager	ITDP
	Males		
1	David Birimumaso	Assistant Commissioner Energy Efficiency And Conservation Organisation/ E-Mobility Coordinator	Ministry of Energy and Mineral Development
2	Abubakar Muhammad Moki	Commissioner, Capacity Building and Policy Development	Cabinet Secretariat- Office of the President
3	Jakob Hornbach	Ceo	GOGO Electric
4	Brendan Cronin	CEO and Founder	Soleil Power
5	Katongole Francis	General Manager	Modjo Energies Limited
6	Mutabaazi Geofrey	CEO and founder	Karaa Africa
7	Felix Muchiri	Programme and Product Manager	Greenhub Kampala
8	Henry Ahebwa	Zembo Bodaboda Rider	Independent
9	Owiny Hakim	E-Mobility Advocacy and Activation Manager	eBee
10	Mungu Ronald	Station Swapper	Zembo

11	Edwin Mumbere	Director	Centre for Citizens Conserving Environment & Management
12	Howard Ping	Project Coordinator	Access2innovation

Appendix 2: Kiira Motors

The Presidential Initiative for Science and Technology Innovations at Makerere University supported the Kiira EV Project in the development of three concept vehicles: Kiira EV (2011), Kiira EV SMACK (2014), and Kayoola Solar Bus (2016) (See below)

Figure 2.1: Kiira EV

Figure 2.2.: Kayoola Solar Bus

Figure 2.3: Kiira EVS