



# STATUS OF ELECTRIC 2&3 WHEELERS: **A CASE OF UGANDA**

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**MINISTRY OF WORKS AND  
TRANSPORT**



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# PRESENTATION OUTLINE

- ▶ Country's overview and Uganda's commitment
- ▶ Kampala City
- ▶ Background on Electric motorcycles & roles of the different stakeholders
- ▶ Electricity generation in Uganda
- ▶ Consumer concerns for electric motorcycle uptake in Uganda
- ▶ Existing policy framework on e-mobility
- ▶ Challenges hindering adoption of 2&3 electric wheelers
- ▶ Way Forward

# UGANDA'S OVERVIEW

Uganda has an estimated population of 48.8 million people. Today, 24% of Ugandans live in cities.

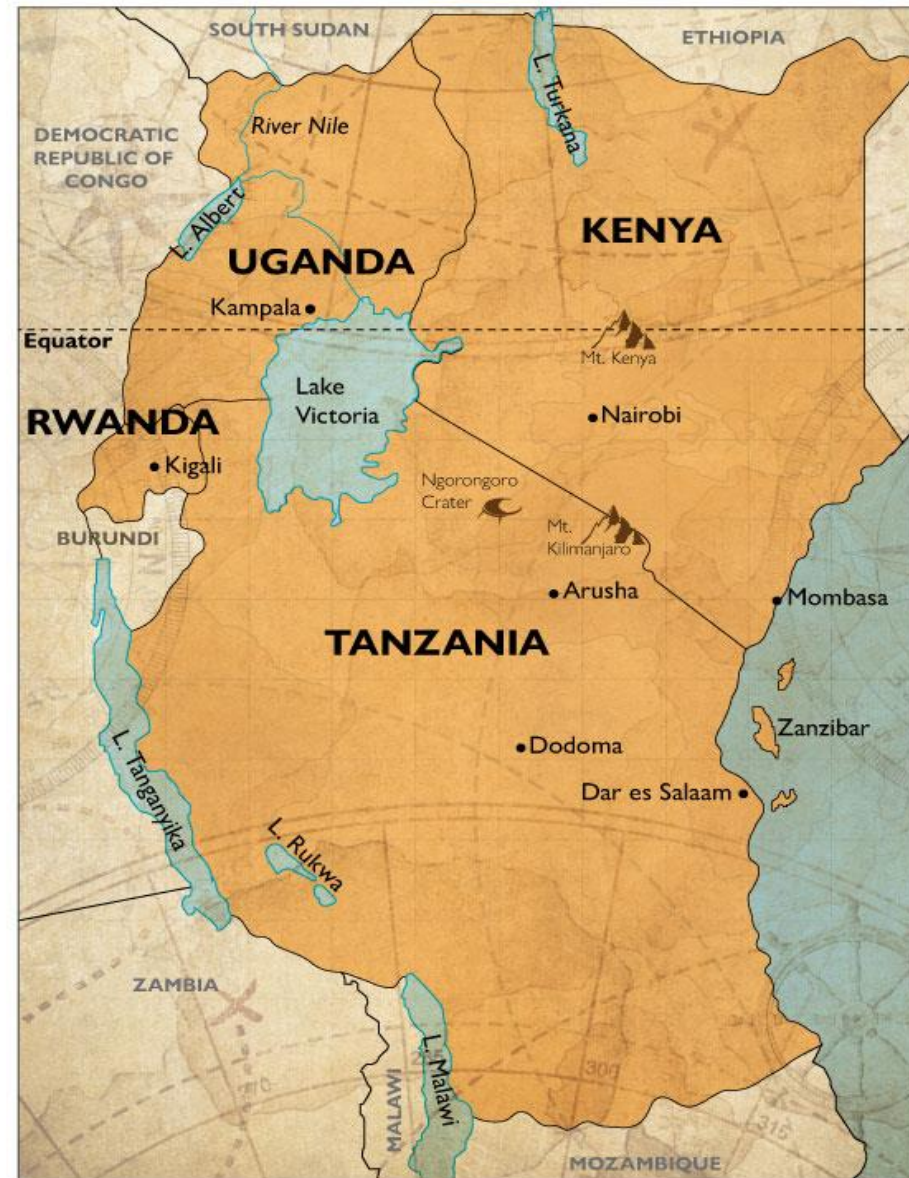
The average temperatures range from 18 to 28 degrees centigrade throughout the year

Uganda's transport is dominated by road transport, accounting for more than 90% of freight and passengers.

Motorization rate in Uganda is very high. Nationwide, the total number of registered vehicles is estimated to be around 1.8 million inclusive of motorcycles.

The registered number of electric motor vehicles in the country is 1278, of which 1076 are electric 2 & 3 wheelers.

The transport sector, especially road transport is a key driver of the increasing Greenhouse Gas (GHG) emissions because of its heavy reliance on fossil fuels





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# UGANDA'S COMMITMENT

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- ▶ Uganda was the first African country to sign the Partnership Plan for Nationally Determined Contributions (NDCs) as part of the Paris Agreement in 2018.
- ▶ The Country is self –committed to working towards low-carbon developments in order to reduce emissions and negative impacts of climate change.
- ▶ During the presidential addresses to the nation on 20<sup>th</sup> , 27<sup>th</sup> July and 5<sup>th</sup> August, 2022, H.E the President of Uganda guided that the correct way to address the current fuel crisis in Uganda is to move from non-renewable energy in the transport sector to e-mobility.
- ▶ The Government of Uganda signed a framework agreement with a company called M-Auto to swap current existing ICE bikes in operation with electric bikes at no cost to the current owners.



# KAMPALA CITY

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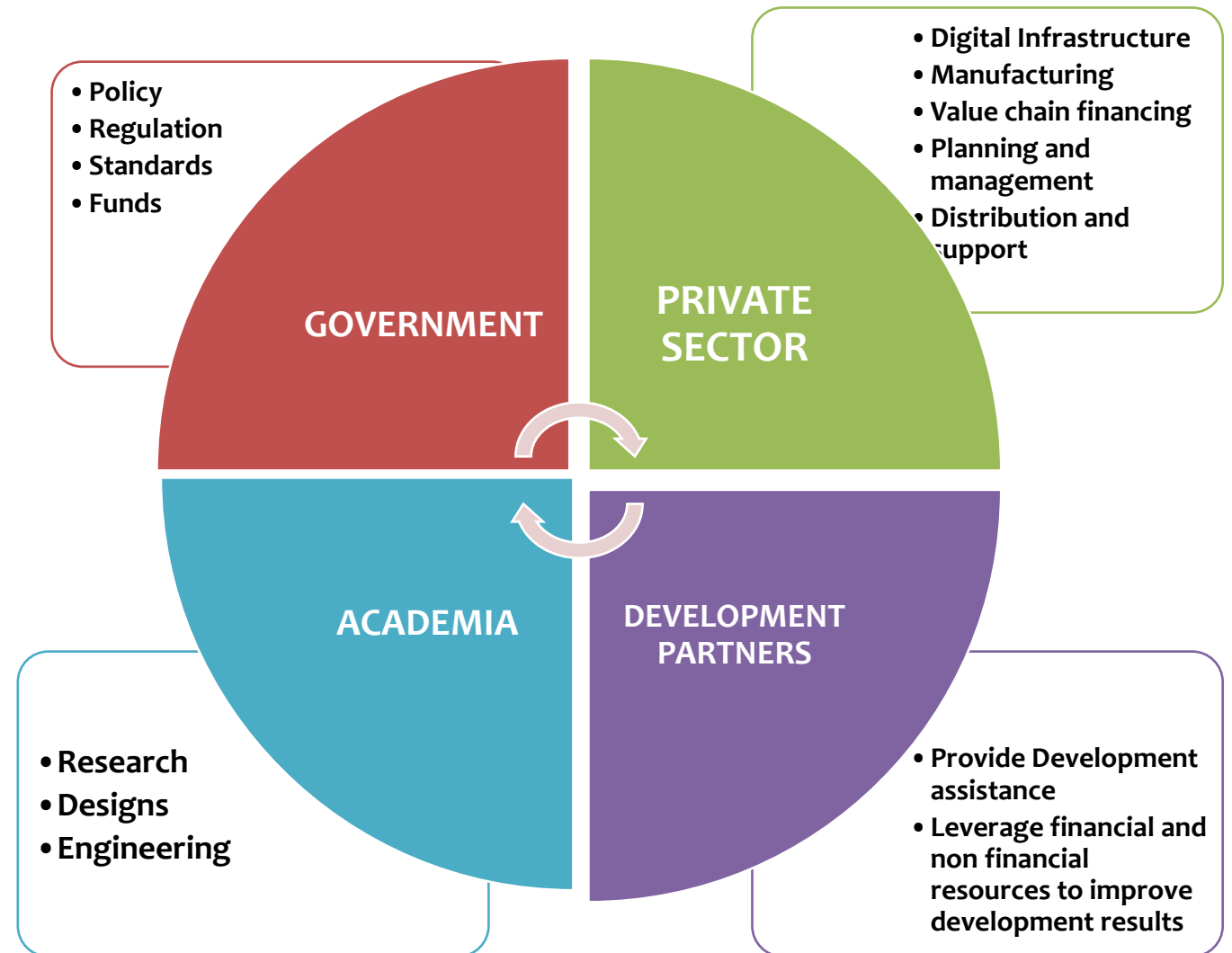


- ▶ Kampala is the capital city and the largest urban centre of Uganda. Kampala has a population of 4 million residents.
- ▶ In terms of modal shares, walking is the most predominant mode. Almost 80% of the total motorized trips are taken by boda-bodas(motorcycle taxis), private cars and minibuses(matatus)
- ▶ The two and three –wheelers are popular because of their maneuverability in congested areas, flexibility and efficiency and low costs, making this transport solution affordable to low-income consumers.
- ▶ Two or three wheelers also frequently transport goods at a cheaper price compared to other means
- ▶ It is estimated that Kampala has over 100,000 boda-bodas in operation
- ▶ It is also estimated that boda-bodas release around 55-59 grams of CO<sub>2</sub> per km leading to an average emission of 5.5 -5.9 kg of CO<sub>2</sub> per boda-boda per day.

## BACKGROUND ON ELECTRIC MOTOR CYCLES

- The production of Electric Motorcycles in Uganda is primarily Private Sector and Academia led. These Electric Motorcycles feature plug-in technology enabling charging at home, or battery swapping programs where the user exchanges the used battery for a fully charged one at a station.
- Electric motorcycles are the most common EV mode seen on the streets of Kampala today, followed by electric bicycles and electric three wheelers.
- The Business models for market adoption of these bikes are still evolving and this field mainly has private players

## Roles of the different Stake-holders





# COMPARISON BTN E-BIKE AND ICE-BIKE IN TERMS OF PROFITABILITY

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S/No.	Item	Weekly Costs (USD) for ICE motorcycle	Weekly Costs (USD) for E-motorcycle
1.	Fuel and energy costs	25	15
2.	Loan repayment/leasing cost	17	17
3.	Oil costs and service	4	2
	<b>Total Costs</b>	<b>46</b>	<b>34</b>
4.	Rides/week	78	78
5.	Price per km	0.16	0.16
6.	Average distance (Km)	7.5	7.5
8.	Price per ride	1.2	1.2
	<b>Total Weekly earnings</b>	<b>92</b>	<b>92</b>
	<b>Net Earnings</b>	<b>46</b>	<b>58</b>



# CURRENT PRIVATE SECTOR PLAYERS IN ELECTRIC MOTOR CYCLES

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## ZEMBO

Zembo is an African solar powered motorcycle company that provides battery swapping for electric motorcycles.

They provide cheap win- win solutions where they commit to ensuring that the drivers get 60 % profit margins in their partnerships. They operate 2 year leases where the driver pays 12,000 Ugx (4 USD) per day for 2 years after which they own it

Zembo also has a network of 27 Electric Motorcycle Battery Swapping Stations around the Greater Kampala Metropolitan Area and plans to expand to 50 stations by the end of 2023.

Zembo prioritizes hybrid stations utilizing the national electricity grid and solar energy.

## MOOJO ENERGIES

are currently converting existing Internal Combustion Engine motorcycles into Electric powertrains

## BODAWERK/GOGO

Bodawerk provides lithium ion batteries for different storage purposes including electric bikes. Their solution is based on a local battery design and development model. For example, their battery electronics such as the print circuit boards (PCB) are locally developed in Uganda.

## M-AUTO

Is an Indian Start-Up with operations in Togo and Benin is exploring entry in Uganda offering 2- and 3-wheeler vehicles, battery swapping systems and energy storage systems.

## GREEN-HUB KAMPALA

**Green Hub Kampala** is a Consortium between Nexus Green, Motor care and TVS that has been established to produce electric motorcycles and deploy charging and swapping stations in Kampala.

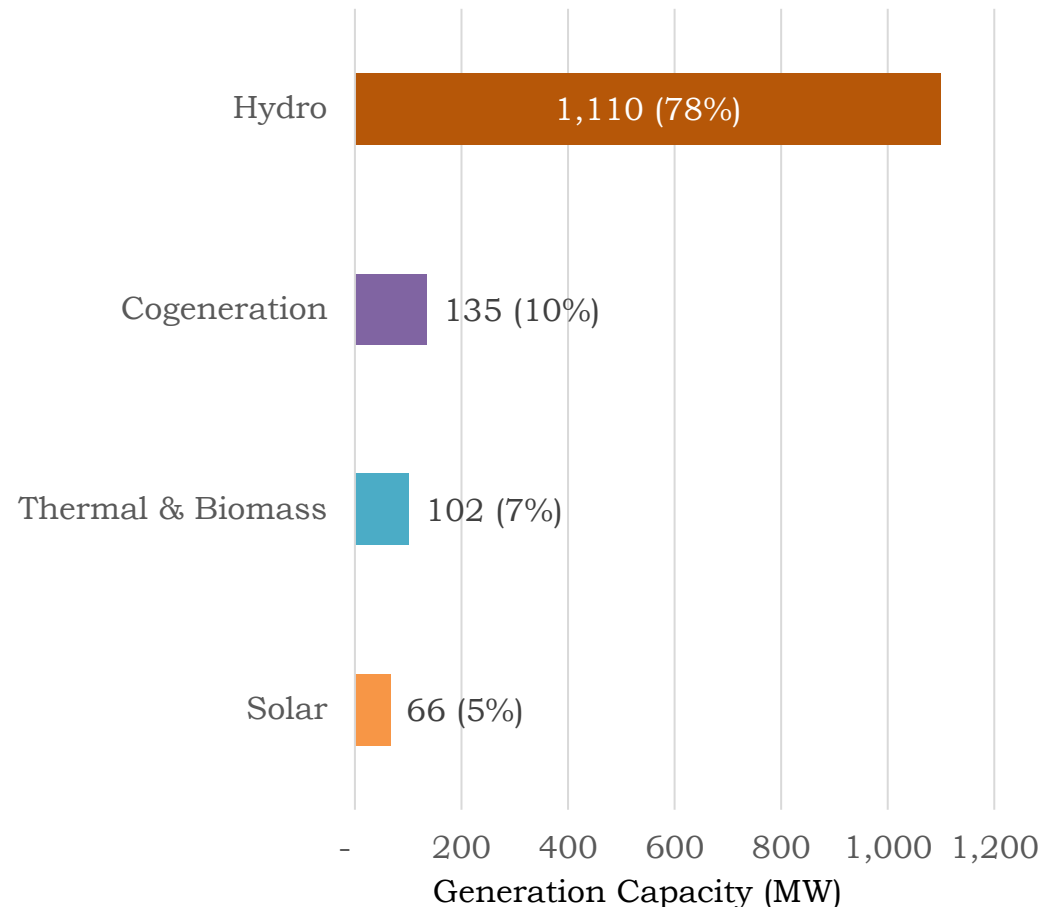
Nexus Green is also planning to install solar streetlights with the capacity to also be utilized as charging points for electric motorcycles – an innovation to be integrated into Nexus Green’s current mission to establish solar streetlights under an already approved Presidential Directive.





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# ELECTRICITY GENERATION IN UGANDA



- ▶ Uganda's electricity is mainly provided by clean energy sources. Currently, the country's installed capacity includes: hydroelectric power (1347MW) , geothermal power (100MW), solar photovoltaic (51MW) and bagasse/cogeneration (96MW). The capacity of hydroelectric power is expected to increase after completion of Karuma and Isimba power dams.
- ▶ The maximum electricity demand is currently at approximately 840MW, representing ~62% of generation capacity. This implies that in the medium term, the country has an excess of electricity which can be harnessed for E-Mobility.



# CONSUMER CONCERNS FOR ELECTRIC MOTORCYCLES UPTAKE IN UGANDA

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## Durability & Weight

Concerns that they don't trust electric motorcycles for durability and ability to carry heavy items



## Unfamiliar brands

Lack of trust in unfamiliar brands. (Bajaj 80%, TVS 15%)



## Range anxiety

Range anxiety that the battery range is too small and that it will require 4-5 charges daily to cover the distances.

Concerns about the insufficiency of charging stations and that finding them might be problematic



# CONSUMER CONCERNS FOR ELECTRIC MOTORCYCLES UPTAKE IN UGANDA

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## Rough terrain & floods

Concerns that electric motorcycles cannot climb hills, cannot handle floods that the bikes have little power



## Price

E-bodas are more expensive than regular bikes



## Skills and Spare parts

Worries about spare parts availability, that there are not enough technicians, or mechanics if an e-motorcycle needs repair.



# EXISTING POLICY FRAMEWORK ON E-MOBILITY

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## Tax Incentives

- ▶ In order to promote electric motorcycles and also reduce pollution, Uganda Revenue Authority in the Tax Amendments Booklet 2023, removed all the import duty taxes on electric and hybrid vehicles as well as electric motorcycles for a period of one year.
- ▶ The **National Transport and Logistics Policy, 2021** requires Government to reduce on the import duty for hybrid and electric vehicles in order to make them more affordable with the aim of realizing both environmental and health benefits. In theory, the hybrid and electric vehicle technology offers cost savings and accident reductions. It emphasizes that regulation of these vehicles may be urgently needed in order for Uganda to ensure safety standards.



# EXISTING POLICY FRAMEWORK ON E-MOBILITY

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## UGANDA NATIONAL CLIMATE CHANGE POLICY

The **Uganda National Climate Change Policy, 2015** whose theme is, “*Transformation through Climate Change Mitigation and Adaptation*” was conceptualized to ensure that all stakeholders address climate change impacts and their causes through appropriate measures, while promoting sustainable development and a green economy. The policy emphasizes an integrated climate resilient and low carbon development pathway founded on adoption of policy priorities to promote modes of transport that consider GHG emission reduction.



# EXISTING POLICY FRAMEWORK ON E-MOBILITY

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## NATIONAL ENERGY POLICY

The **National Energy Policy, 2019** requires Government to promote clean mobility and energy efficiency in the transport sector and facilitate investments in related infrastructure. The Policy also aims at ensuring sustainable development and utilization of energy resources, services and products by all Ugandans towards transformation of the national economy. The Policy also emphasizes the need to build adequate transmission and distribution infrastructure to supply industrial parks and promote renewable and alternative energy sources.



# CHALLENGES HINDERING ADOPTION OF 2&3 ELECTRIC WHEELERS

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## FOR THE PRIVATE SECTOR

- ▶ Given the limited infrastructure in the country, e-mobility start ups are developing through vertically integrated models, which are incredibly capital intensive, the enterprises need to account for batteries, charging infrastructure, maintenance, advertisements and advocacy- thereby requiring longer payback periods for large scale purchases i.e motor cycle chassis and lithium-ion batteries. This hinders their ability to achieve economies of scale.



# CHALLENGES HINDERING ADOPTION OF 2&3 ELECTRIC WHEELERS

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## Technical

- Lack of standards & Interoperability
- Connection & impact on the grid
- Lack of skills for manufacturing & batteries
- Lack of skilled personnel to manage, operate and maintain EVs
- Missing proof of concepts / demonstration projects
- Concerns about power availability and grid stability

## Regulatory and Institutional

- Lack of coordination among the various MDAs
- Lack of awareness and capacity of decision makers in government, industry & finance
- No policy guidelines exist at the moment to guide imports of electric vehicle components
- Lack of national and local strategies , roadmaps & planning instruments

## Economic and Financial

- High cost of electric vehicles
- Absence of supporting infrastructure (battery charging ports) across the country to promote the use of electric powered vehicles
- Lack of adequate EVS for use under the conditions met on the Ugandan roads
- High cost of electricity





# WAY FORWARD

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E-mobility can serve as a catalyst for transformative development in Uganda. This can be achieved through concerted efforts through the following ways:

1. Development of more policies and creating an environment that supports e-mobility innovation, open and collaborative partnerships between public-private and research sectors to incentivise transition from ICE motor cycles to electric motorcycles
2. Availability of appropriate technical and financial support for Electric vehicles industry development.
3. Construction of more charging infrastructures to support e-mobility
4. Capacity building on key Government officials on the promotion of e-mobility



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Thank you for listening