



Electrification of Three-Wheelers in Tanzania

EXECUTIVE STATEMENT

Tanzania, like many developing countries, faces significant challenges related to air pollution and carbon emissions. The rapid rate of urbanisation means that there is added strain on the transportation sector and an increase in emissions from private and public forms of transport.

Much of the country is reliant on traditional three-wheelers, generally powered by internal combustion engines (ICE) to get them from home to work, school or elsewhere, and this greatly contributes to these problems due to their reliance on fossil fuels and the associated emissions. Electrifying these vehicles can help mitigate air pollution, reduce the country's carbon footprint, and contribute to global climate change mitigation efforts all while being more cost-effective than their counterparts.

However, despite interest from the private sector in this innovative and lucrative market, the Tanzanian government is slow on the uptake and implementation of necessary regulations and policy frameworks to ensure a strong enabling environment for e-mobility. Recommendations include policies targeting financial and regulatory incentives, infrastructure development, research and development support, awareness, and educational campaigns.

This Policy Brief also examines the Tanzanian EV sector's current challenges and presents select best practices from Rwanda, Kenya and Uganda.

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PROBLEM STATEMENT

There is no denying that African cities are rapidly growing, with Tanzania being no exception. According to a WEF report, 3 of Africa's fastest-growing cities are located in the east African country, namely Dar es Salaam, Mwanza and Songea. Fast-growing cities also mean added pressure on infrastructure and public systems which are already strained. A major burden falls on the transport sector including public transportation services as more people move to cities to find better-paying work, improved living conditions or to find education opportunities.

Globally, the transport sector is a major contributor of emissions, pollution and toxins into the environment which is why many countries have targeted the transformation of this sector within their Nationally Determined Contributions to achieve their SDG targets by 2030. In its 2021 published NDC Commitment Report, the United Republic of Tanzania indicated 4 main sectors to target mitigation efforts, namely energy, transport, forestry, and waste.

When taking a closer look at the goals within the transport sector, 3 key aims are highlighted:

1. Promoting low-emission transport systems through the deployment of mass rapid transport systems and investments in rail, maritime and road infrastructures, including high-quality transport systems and expansion/scaling up of BRT infrastructures.
2. Promoting the use of renewable (clean) energy in transportation systems.
3. Introduction and promotion of Non-Motorized Transport systems and facilities and networks in both megacities and metropolitan cities by 2030.

STATE OF THE ART

Regarding the national vehicle fleet, the use of private vehicles is projected to increase fourfold from 120,000 to 515,000 cars from 2010 to 2023. The majority of trips taken are by public transport, representing 87% (AFDB 2013).

Currently, the public transport sector in Tanzania is dominated by "dala-dalas", which are privately owned minivans that operate on pre-determined routes. Another common and favoured form of transportation is 2 and 3-wheelers.

Especially 3-wheelers are an important aspect of the transport sector as they are seen as feeders to the larger forms of transport (dala-dals and busses) while also providing door-to-door transport.

As of 2018, there were 1 282 503 motorized 2- and 3-wheelers operating on Tanzanian roads.

While these 3-wheelers, referred to locally as Bajajis and Gutas (cargo vehicles with a flatbed, typical for market use) are practical, accepted by the general population and readily available, they are major polluters.

Point pollution from 3-wheelers with internal combustion engines (ICE) causes bad air quality, which can lead to respiratory diseases and heart disease while also drastically increasing greenhouse gases, damaging the environment and ultimately accelerating climate change.



Dala dala buses



Traditional Bajaji

THE FUTURE IS ELECTRIC:

The adoption of Electric vehicles (EVs) is on the rise as people all across the world realize the need to make a change to combat climate change. An estimated 5000 EVs are on Tanzanian roads, the most in all of East Africa. According to AFEMA, at least 10 companies are supplying EVs in Tanzania.

Typically the business model is importing, distributing and servicing the EVs. Some companies have localised the supply chain, such as TRÍ, a young company that started operating in October 2022, which has a full manufacturing license for Tanzania, allowing them to access incentives for local assembly. This aids in reducing the price of the electric 3-wheelers which they offer. While they import the kits, they assemble the 3-wheelers in Dar es Salaam.

Economically, electric three-wheelers provide lower operating costs compared to their ICE counterparts and lower maintenance costs as they operate with fewer moving parts.

“A litre of gasoline, enough to travel approximately 20 kilometres, costs about US\$1.20. Covering the same distance with an electric three-wheeler costs just US\$0.20. These savings can offset the price difference between an electric and a conventional bajaj within six to eight months.”

- TRÍ, JUN 2024



e-bajaji in Dar es Salaam



Local assembly of e-bajaji kits

BARRIERS AND CHALLENGES IN THE TANZANIAN EV SECTOR:

High import taxes: The current business model revolves around importing EVs into the country, high import taxes pose a major barrier as they increase the final price, making purchasing an EV not as lucrative

Unclear government policy: New technologies require new concise guidelines and policies which need to be implemented and used by customs agents, quality and standards authorizations and regulatory bodies. Start-ups in the industry have reported difficulties in registering their vehicle, obtaining license plates or insurance

Limited funding and high upfront costs: The current business model is capital-intensive and there is a need for more funding in the EV sector in Tanzania. While Ugandan and Kenyan companies have raised \$5 million and \$50 million respectively, Tanzanian e-mobility companies have only raised \$1 million. This funding is necessary for research and development, implementing pilot projects and servicing the vehicles.

Limited qualified technicians: Currently technicians and mechanics are trained to service traditional ICE 3-wheelers. There is a need for adequate training for technicians and mechanics in dealing with electric vehicles (e.g proper battery handling and maintenance).

Low electricity grid access: Access to electricity remains low, according to the World Bank, around two-thirds of the mainland population do not have access to electricity. The national average of electricity access lies at 46% but disparities exist between urban coverage (79%) and rural (39%), all despite the national grid coverage being higher than 90%. In addition to low access, the supply of electricity is often unreliable and service provision is poor due to aging infrastructure and limited operation and maintenance.

Limited consumer knowledge: When introducing new technologies to the public, it is important to adequately inform and educate the target market. When consumers are made aware of more cost-effective and improved alternatives, acceptance is higher and markets are easier to enter as demand already exists.

Lack of charging infrastructure: In order for e-mobility to function properly, charging infrastructure, powered by renewable energy, needs to be deployed. Currently, there are no public charging stations and no official regulations and policies on standards, connection and access.

RELEVANT AUTHORITIES



TRANSPORTATION

Tanzania Revenue Authority (TRA)

In charge of issuing vehicle registration/ licences registers all imported vehicles both for commercial and private use



Land Transport Regulatory Authority (LATRA)

regulates the land transport sector, especially freight and passenger transport (long-distance buses, city buses, cargo vehicles, taxis, two- and three-wheeled motorcycles), rail transport and cable transport. registers and licenses all commercial vehicles



ELECTRICITY

Tanzania Electricity Supply Company (TANESCO)

Generates, distributes and sells electricity



STANDARDS AND QUALITY

Tanzania Bureau of Standards (TBS)

sets the standards for imported and modified vehicles
Sets standards for electricity provision

Government initiatives and current policies

Despite updating the NDCs in 2021 and identifying both energy and transport as 2 main mitigation focus areas, Tanzania has yet to produce a specific policy regulating electric vehicles. This makes participation from the private sector as well as internationally funded projects difficult to plan and implement as they have no regulations to follow and might face regulatory barriers in the future.



POLICY RECOMMENDATIONS

FINANCIAL INCENTIVES

Subsidies and Grants

- **Purchase Subsidies:** Direct financial incentives for consumers EVs. These can significantly reduce the high upfront costs.
- **Grants for Manufacturers:** Financial support for companies to develop and produce electric vehicles and components.

Tax Incentives

- **Tax Credits:** Consumers can receive credits against their income taxes for purchasing EVs.
- **Tax Deductions:** Businesses can deduct the cost of EVs and associated infrastructure from their taxable income.
- **Reduced Registration Fees:** Lower registration fees for electric vehicles compared to internal combustion engine vehicles.

Rebates

- **Cash Rebates:** Immediate rebates at the point of sale, reducing the effective purchase price.
- **Utility Rebates:** Rebates offered by utility companies for installing home charging stations or for the purchase of EVs.

REGULATORY INCENTIVES

Emission Standards and Quotas

- **Zero Emission Vehicle (ZEV) Mandates:** Regulations requiring a certain percentage of vehicle sales to be zero-emission vehicles.
- **Low Emission Zones (LEZ):** Restricted Access for Polluting Vehicles: Certain urban areas may restrict access for high-emission vehicles, giving EVs an advantage.

INFRASTRUCTURE DEVELOPMENT

Charging Infrastructure

- **Public Charging Stations:** Investment in the widespread deployment of public charging stations, including fast-charging networks.
- **Home Charging Solutions:** Incentives for installing home charging units, such as grants or tax credits.

RESEARCH AND DEVELOPMENT SUPPORT

Innovation Grants

- **R&D Funding:** Financial support for research and development of new EV technologies, batteries, and infrastructure solutions.

Collaborative Projects

- **Public-Private Partnerships:** Collaborative efforts between government agencies and private companies to advance EV technologies and infrastructure.

AWARENESS AND EDUCATIONAL CAMPAIGNS

Public Awareness Campaigns

- **Educational Programs:** Informing the public about the benefits of EVs and available incentives.
- **Test Drive Events:** Offering opportunities for potential buyers to test drive EVs.

Corporate Partnerships

- **Fleet Electrification Programs:** Partnerships with companies to transition their vehicle fleets to electric.

AFRICAN BEST PRACTICES

When looking at the neighboring African countries, we see significantly stronger enabling environment in terms of regulatory structures in the field of EVs



RWANDA

As described in the updated 2020 NDC report, the e-mobility programme plans for the phased adoption of electric buses, passenger vehicles (cars) and motorcycles from 2020 onwards, resulting in displaced conventional vehicle sales, transport fuel imports and associated GHG emissions.

Implement Electric Charging stations at existing fuel stations around the City as part of the Transport Plan of the Kigali Master Plan 2050



UGANDA

Uganda introduced the National Electric Mobility Policy in 2018 to promote electric vehicles through incentives, tax breaks, and infrastructure development. The Ugandan government aims to integrate EVs into the country's transportation network as part of the sustainable transport system outlined in Uganda's Vision 2040.

In 2014, a State Enterprise was launched: Kiira Motors Corporation (KMC) which is jointly owned by the Government of Uganda (96 %) and Makerere University (4 %). KMC provides technology transfer, contract manufacturing and supply chain localisation



KENYA

The Updated Integrated National Transport Policy states that the Government will encourage the uptake of new and emerging technologies, including electric locomotives, motor vehicles, motorcycles and bicycles to reduce GHG emissions;

The Government of Kenya wants to increase the share of EVs in the transport sector, aiming to reach 5%

The Kenya Bureau of Standards has developed standards for e-mobility; energy consumption and range of electric vehicles as well as hybrid-electric road vehicles exhaust emissions and fuel consumption measurements

Regulatory actions and financial mechanisms will be put in place to increase the ownership of EVs in Kenya;

- Incentives through lower import duty for electric cars, bicycles and tuk-tuks and lower vehicle road taxes
- Revised Building Code incorporating charging stations in public buildings and new estates
- Awareness-raising on EE in vehicles and e-mobility

SOURCES

These are the 15 fastest-growing cities in the world, World Economic Forum, Feb 20, 2020

<https://www.weforum.org/agenda/2020/02/15-fastest-growing-cities-world-africa-populations-shift/>

Tanzania Nationally Determined Contribution, July 2021

https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA_NDC_SUBMISSION_30%20JULY%202021.pdf

Barriers to E-Mobility in Tanzania, Africa e-Mobility Alliance, March 2023

https://www.africaema.org/resources/AfEMA_country_report_2023_Tanzania.pdf

Tanzania Improving Sustainability of the Power Sector and Accelerating Electricity Access: A Proposed WBG Roadmap, World Bank Group, June 2024

<https://documents1.worldbank.org/curated/en/099061424235032922/pdf/P17965415d283b02819dcb198da-bea9914a.pdf>

Rwanda's Updated Nationally Determined Contribution, May 2020

https://unfccc.int/sites/default/files/NDC/2022-06/Rwanda_Updated_NDC_May_2020.pdf

Transport Plan Kigali Master Plan 2050, 2018

https://bpmis.gov.rw/asset_uplds/kigali_master_plan/3_Kigali%20Master%20Plan_Transport%20PlanLowRes.pdf

Kenya National Energy Efficiency and Conservation Strategy, Ministry of Energy, 2020

<https://unepccc.org/wp-content/uploads/2020/09/kenya-national-energy-efficiency-and-conservation-strategy-2020-1.pdf>

Picture credits

Dala dala busses: <https://unboxingtanzania.com/de/everything-you-need-to-know-about-daladalas/>

Traditional Bajaji: Gardenofedenlea, March 2020

E-bajajis: Own Images