Context / Gap Analysis / Problem Statement.

Kenyan Context.

Electric mobility provides a good opportunity for Kenya to reduce emissions from transport (by about 0.6 MtCO2e against the Business as Usual scenario in 2030) and improve air quality (GIZ 2018, p. 16). However, electric mobility uptake in the country is still very skimpy. Most stakeholders are under the impression that very little is happening around electric mobility. This leads to minimal engagement between policymakers and other key players on the issue.

The electric mobility space in Kenya is gradually gaining momentum. There is an increasing number of players coming in and driving the transition. So far, most of the focus is on electric two-wheelers largely driven by private companies with minimal government intervention. The government expressed its intentions to electrify one of the BRT corridors in the country and stated plans to improve existing regulatory hurdles. Overall, the series showed increased interest from the public, government agencies as well as private companies.

The state of electric mobility in Kenya.

The benefits of electric mobility for the country included improved air quality, reduction of greenhouse gas emissions, and positive economic impacts of the technology through the creation of new local value chains. It also noted the transformative potential of electric motorcycle uptake in the country, presented more than 10 companies developing electric mobility products in the country already, showcased new electric mobility standards developed by the Kenya Bureau of Standards, as well as brought to attention the halving of excise duty charged on electric car imports from 20% to 10%.

Rural and urban applications of electric mobility in Kenya

This included input from Knights Energy, Siemens Stiftung, and Wetu. Siemens is partnering with GIZ to implement an electric mobility pilot in rural areas of western Kenya.

The Siemens project aims at generating empirical data on the types of e-mobility applications that would work in a rural setting. The project assesses business models that fit local conditions through the piloting of E-Cargo Bikes, E-Trucks, E-Motorcycles, and E-Boats.

Knights Energy on the other hand is providing solutions for the ownership and operations of electric vehicles in Kenya.

Wetu is a social enterprise. It provides e-mobility vehicles and charging infrastructure as well as business models to rural areas of Kenya.

Electric mobility and the energy supply.

The energy supply in the country and the grid's capabilities to support increased uptake of electric mobility is an important considerations. Energy conditions in Kenya seem to be advantageous for electric mobility for several reasons: Kenya's grid is currently supplied by around 90-93% of renewable energy.

Image source: Techcabal

Africa E-Mobility.

According to the Changing Transport Organization report, between 2000 and 2016, Sub-Saharan Africa experienced a 75% increase in emissions, with transport emissions increasing by 153% in Ghana, 73% in Kenya, and 16% in Nigeria. The rapid rural to urban migration coupled with limited public transportation and dependence on fossil fuels for mobility has increased congestion and poor air quality in most African metropolitan cities.

Driven by health and environmental concerns and the need to reduce dependency on oil imports, electric mobility (e-mobility) is gaining prominence across the continent's public and private sectors. In 2019, Paul Kagame, president of Rwanda, announced his government's intention to replace Internal Combustion Engine (ICE)-motorcycles with e-motorcycles. This move spurred e-mobility innovation in the country. Mobility startups such as Ampersand are leading the country's switch to clean energy.

Closing the Gap – Financing and Infrastructure.

For e-mobility to take off on the continent, we have to consider two factors: financing and reliable charging infrastructure. Both are currently lacking. Access to funding is a barrier for many Africans, but this is especially evident for the asset-heavy e-mobility sector. If you look at the economics of electric mobility, the cost of ownership and operation of electric vehicles is much lower than that of petrol vehicles when you factor in fuel, maintenance, and longevity.

When broken down, e-mobility is cheaper for an e-motorcycle rider in the long term compared to a petrol motorcycle. However, the initial buy-in cost might deter adoption, especially now when prices are high with the sector still in its infancy.

The secret is how to package costs to deliver lower prices to a rider or driver efficiently. We need financing to help drivers and riders realize the benefits of a lower cost of ownership. Even today, with higher upfront costs, the total cost of ownership of electric motorcycles is much cheaper per kilometer than that of petrol bikes. Lease financing can deliver that benefit to riders.

It is possible to build new infrastructure and make it optimal for electric vehicles. For example, off-grid energy could be a great way to power vehicles presenting an opportunity for a few countries in Africa. In Kenya, 9 million households already have access to off-grid renewable energy, with numbers estimated to rise in the coming years.

Electric Propulsion As a Service.

The startup ASOBO is working to reduce fuel emissions' negative impact by providing electric mobility solutions on the water in Lake Victoria in Kenya. They provide "electric propulsion as a service." Some of the services they offer include financing assets, transport of batteries, daily recharging, maintenance and repair, and a rescue backup. Changing petrol outboards for electric engines greatly reduces CO2 emissions and pollution of water bodies, but also makes propulsion much more affordable and reliable to the customer.

Objectives & Research Contributions.

(1) Document and categorize the potential of e-mobility in Sub-Saharan Africa (SSA);

(2) Review the existing policy/incentives on e-mobility and make policy recommendations for fast deployment in SSA.

(3) Economic benefit to public electric vehicle (PEV) owners/drivers,

(4) Economic benefit to infrastructure owners/operators,

(5) Emissions and health effects of increasing growth of PEVs compared to internal combustion engine vehicles.

(6) Develop a systematic assessment process that can be applied anywhere in SSA.

These metrics could capture the expected benefits of investing in public charger infrastructure by geographic areas in SSA)

References.

1. SLoCaT (2018). Transport and Climate Change Global Status Report 2018. Available at: http://slocat.net/tcc-gsr
2. https://www.weforum.org/agenda/2018/12/kenya-wants-to-run-entirely-on-green-energy-by-2020/
3. E-Mobility Solutions for Rural Sub-Saharan Africa: Leveraging Economic, Social, and Environmental Change
4. UNEP (2018), Africa Used Vehicle Report 2018, https://wedocs.unep.org/bitstream/handle/20.500.11822/25233/AfricaUsedVehicleReport.pdf?sequence=1&isAllowed=y
5. 2 UNEP (2018), Africa Clean Mobility Week, https://www.unenvironment.org/news-and-stories/story/forty-two-african-countries-agree-cleaner-mobility-roadmap-continent
6. 3 GIZ (2020) Electric Mobility in Kenya:
   The Facts, Local comparison study conducted in 2017 by Drive Electric (2017)1
   Chakwizira (2019), Rural transport and climate change in South Africa: Converting constraints into rural transport adaptation opportunities