



MINISTÈRE
DE L'ÉCONOMIE,
DES FINANCES
ET DE LA SOUVERAINETÉ
INDUSTRIELLE ET NUMÉRIQUE

Liberté
Égalité
Fraternité

Direction Générale du Trésor

EXECUTIVE SUMMARY

ECONOMIC LETTER OF EAST AFRICA AND THE INDIAN OCEAN (EAIO)

Δ PUBLICATION OF THE REGIONAL ECONOMIC DEPARTMENT – NAIROBI, KENYA

N° 46 – July 2024

Urban transport in EAIO: Spotlight on e-mobility

Key numbers

- Ethiopia currently spends more than **\$4.0 billion per year (2022/2023)** on hydrocarbon imports
- In Kenya, **transport accounts for a large and growing share of greenhouse gas emissions** estimated at **13 %**, including **6 %** for transport in the Nairobi urban area
- According to the **Rwanda Environment Management Authority (REMA)**, converting **20 %** of its public transport fleet by 2030 would reduce greenhouse gas emissions by 72,000 tonnes of carbon

In summary...

Urban transport in EAIO: Spotlight on e-mobility

The electric mobility (e-mobility) sector in the EAIO is marked by significant contrasts linked to countries' level of economic development. While some countries, notably Kenya, Uganda, Rwanda, Ethiopia and Mauritius, are showing promising signs in this sector, with the introduction of an incentive-based legal and fiscal framework, subsidies and investment support, other countries are still less advanced financially and politically to initiate this transition. The electrification of mobility translates to massive investment (import and production of new vehicles, construction of recharging infrastructures), for households, businesses and governments alike. The opening up of these new markets presents an opportunity for international partners, as well as for producers of electric vehicles and related equipment, who remain mainly Chinese.

In detail...

Emerging e-mobility markets require massive financing

E-mobility **refers to the use of vehicles powered by electrical energy sources, mainly rechargeable batteries, rather than fossil fuels.** In the region, this includes **electric cars, two-wheelers** and **public transport**, mainly buses and minibuses. The development of e-mobility involves both the construction of these recharging networks and the production or import of electric vehicles.

The deployment of e-mobility in the region depends on the level of development of individual countries. Countries with higher development indicators (GDP, HDI) have e-mobility development initiatives. Kenya, Uganda, Rwanda, Ethiopia and Mauritius are the only countries in the region where a significant e-mobility market is emerging.

In the poorest countries of the EAIO region, such as in Burundi and Sudan, **priority is given to developing road and rail infrastructure networks, both urban and interurban, at affordable prices**, with decarbonization a secondary concern.

Despite there is growth in countries where e-mobility is developing, it remains marginal. The percentage of electric vehicles registered in each country does not exceed 1.62 %, the EV rate in Kenya, the most advanced country in the region in this sector.

A distinction needs to be made between the development of electric public transport networks, mainly BRT networks, **and the development of private electric supply**, mainly electric cars and two-wheelers:

- **The development of electric public transport requires strong financial support from governments.** However, in the countries of the region, public authority is limited by (i) public debt, which restricts budgetary margins for investment, (ii) the difficulty of raising tax revenues, and (iii) the multiplication of priorities. As a result, **countries in the region are finding it difficult to invest in this capital-intensive sector**, making support from international donors all the more necessary.
- **The development of electric cars in the region is difficult, due to the very high financing requirements for households and businesses.** Importing vehicles from abroad, setting up a local electric vehicle production and assembly plant, as well as a network of recharging stations all represent very high costs, and act as barriers to entry for local and foreign companies in this sector. Similarly, **the electrification of minibuses**, the main means of transport in urban areas and often informal, is difficult to implement as private operators do not benefit from public funding and often do not generate sufficient profitability to make the necessary investments.
- **Two-wheelers are attracting increased interest from local and foreign companies**, particularly for the supply of vehicles used by motorcycle cabs and delivery companies. Start-ups such as Zembo in Uganda, Kiri EV, Roam and Stima Boda in Kenya are particularly active in this market segment, often via battery swapping solutions.

Robust political support for the sector, despite limited room for manoeuvre

Reducing carbon emissions and complying with the Paris Agreements are among the reasons why many countries in the region are committed to accelerating e-mobility. **Transport accounts for a large and growing share of greenhouse gas emissions in the region's countries.** In Kenya, this is estimated at **13 %**, including 6 % for transport in the Nairobi urban area. Reducing emissions from the transport sector therefore is essential if countries are to achieve the ambitious targets set by their nationally determined contributions. Uganda, Kenya and Rwanda have pledged to reduce their greenhouse gas emissions by 29 %, 32 % and 38 % respectively.

However, the electrification of mobility does not have the same impact in terms of reducing greenhouse gas emissions, depending on the **proportion of renewable energy resources in each country.** While the **Ethiopian and Kenyan energy resources are particularly well suited to decarbonizing mobility** through electrification (**98.2 % and 77.8 % of installed capacity is renewable**), the energy resources of other countries such as Mauritius (29.8 %) and Tanzania (34.2 %) are less so. **For these countries to have an effective policy**

for reducing CO₂ emissions, the transition to e-mobility must be coupled with an **absolute and relative increase in renewable energy capacity**.

A high-performance network of electric charging stations relies on significant electrical capacity and low-cost electricity. The region's geography offers **abundant, low-cost hydro and geothermal power**. For example, 84.7 % and 78 % of electrical capacity in Ethiopia and Uganda respectively is hydroelectric. On the other hand, **geothermal energy, although still under-exploited, is widely available in the East African countries** crossed by the East African Rift. Solar and wind power are intermittent sources of electricity, and their development could also help to power electric charging stations.

Government support for the electrification of mobility is also driven by health concerns. The region's capital cities, which have the most economic activity, are faced with high levels of air pollution that are dangerous for the population. Kampala, for example, is ranked as the 5th most polluted city on the African continent. In Nairobi, 40 % of fine particle emissions (PM_{2.5}) are linked to road transport, and air pollution was 4.2 times higher than WHO recommendations in 2019. The transition to a fleet of electric vehicles would help limit this air pollution and protect the population, especially as the current fleet of vehicles, which is very old, is a major emitter of fine particles.

The political authorities' support for the transition to e-mobility is also explained by the need to reduce foreign currency outflows and rebalance balances of payments. Imports of petroleum products represent between 10 % (Ethiopia) and 19.3 % (Kenya) of the value of imports in 2019. A transition to e-mobility would make it possible to reduce dependence on imports, by relying on locally produced electrical energy.

To support the transition to electric vehicles on the demand side, political authorities can use tax exemptions. Rwanda and Mauritius, for example, have introduced an exemption from import duties on electric vehicles, batteries, spare parts and recharging equipment.

Subsidies and project support enable governments to finance the electrification of public e-mobility. Bus Rapid Transit (BRT) projects in the region's main capitals - Nairobi, Dar-es-Salam, Kigali and Addis Ababa - provide an opportunity to electrify the urban transport network. Indeed, **the large volumes of vehicles ordered, the support of international donors and the prospects of long-term profitability** mean that public authorities can invest heavily in e-mobility.

The development of the market represents an opportunity for foreign companies

The export market for electric vehicles (assembled or not) is dominated by Asian companies (Indian for two-wheelers, Chinese for cars and buses). These companies benefit from competitive pricing, which enables them to prosper in the region. Some companies, such as **BYD Automotive**, partner with local firms to supply parts, which are then assembled by local companies. The Chinese bid is particularly well suited to the supply of rolling stock for BRT networks. In Dar es Salaam, Kigali and Nairobi, the majority of electric fleets are expected to be manufactured in China.

Against this backdrop of fierce competition, opportunities exist for French players, albeit limited to certain areas. Battery recharging systems, which are still virtually non-existent in the region, appear to be promising. It includes (i) the construction of fast-charging infrastructures, (ii) the management of these charging points and (iii) the deployment of software to optimize the use of the charging station system. **Total Energies**, already present in almost all the countries in the region via its network of service stations, appears to be well-positioned in this market. **The vehicle operation segment**, mainly two-wheelers, also appears to be promising, as shown by the example of **Zembo** in Uganda. **In the medium term, electric two-wheelers appear to be the most promising sector in the region**, as they are **best suited to the needs of companies** (delivery companies, motorcycle cabs) and **private individuals** with limited purchasing power.

In Kenya, the development of e-mobility remains in its infancy, despite the imperative need to transition for ecological and health reasons

The country is experiencing **increased motorization**, a vector of road congestion, accidents and air pollution. The **number of vehicles on the road is increasing by about 10 % a year, and new vehicles are almost all combustion-powered**, with motorcycles accounting for a large proportion (42 % in 2019, compared with 32 % for cars). In 2023, 1.62 % of vehicles on the road were electric.

The development of e-mobility would make it possible to **address ecological and health challenges**, while helping to **reduce Kenya's greenhouse gas emissions**, given the weight of the transport sector in the country's carbon footprint (**23 %**, **8.7 eqGtCO₂**), its existent 90 % renewable electricity capacity, and its strong commitment to reducing emissions: **-32 % eqCO₂ by 2030** according to its NDC and its goal of carbon neutrality by 2050.

At the end of March 2024, Kenya's Minister of Transport unveiled his **roadmap for initiating an e-mobility policy** to remove the main obstacles hindering its development. Priority projects include: (i) the development of a **coherent regulatory framework** to encourage the adoption of e-mobility, (ii) the **promotion of domestic assembly** of electric cars and the integration of the country into global value chains, (iii) the **construction of related infrastructures**, notably charging stations, (iv) the introduction of a **tax framework to encourage the adoption of electric vehicles**. Despite the government's stated determination, concrete projects have not yet been formalized. The most recent strategy, the **Kenya National Energy Efficiency and Conservation Strategy 2020**, aimed to achieve a target of 5 % electric vehicles by 2025, which so far has not been attained.

The Kenyan government believes that the **country's installed electrical capacity** (3.7 MW in June 2023, 90 % from decarbonized sources) **can support accelerated development of e-mobility**.

The e-mobility market is currently largely dominated by start-ups, mainly positioned in the B2B two-wheeler segment, targeting delivery companies (Uber, Bolt, Jumia) or *boda-boda*. They are positioned all along the value chain: assembly (Roam, Powerhive), vehicle sales/leasing (Kiri EV, Mazi, Stima Boda), setting up of charging infrastructures and battery swapping (Mazi, ARC Ride, Roam, Stima Boda). Some twenty companies are currently active in Kenya, characterized by the modest size of their operations (fleet of around ten vehicles, a few recharging stations).

The deployment of electric buses in public transport systems has begun. Kenyan start-up *BasiGo*, which assembles parts mainly designed by Chinese manufacturer BYD Automotive in Kenya, announced jointly with Kenya Vehicle Manufacturers (KVM) in April 2024 to aim for the production of 1,000 new electric buses to meet the growing demand from transport operators. 500 of these buses should reinforce the capital's network. The BRT project, in particular Line 3 under European funding (see dedicated chapter), should operate with a fleet of electric buses.

In Uganda, the e-mobility sector is still underdeveloped, but strongly supported by the government

In 2023, Uganda had around 1.8 million registered vehicles, of which only 1,278 were electric, 84 % of them two-wheelers. The electric vehicle fleet is still marginal in relation to the total number of vehicles, despite the rapid growth of the two-wheeler market and increasing penetration of motorcycle cabs (*boda bodas*).

The Ugandan government has shown clear support for e-mobility, pledging to reduce transport emissions by 29 % by 2030 as part of the Paris Agreement. The electrification of mobility can be supported by renewable energy resources: 90 % of the country's electricity will come from renewable sources by 2023, including 78 % from hydropower. Electrification will therefore help reduce dependence on imported fossil fuels, supporting a transition to more sustainable transport, thanks to affordable electricity.

Government support is provided through Kiira Motors Corporation (KMC), a state-owned company set up in 2014 to develop and manufacture electric vehicles, including city buses. Some twenty Kayoola buses manufactured by KMC are now in service in Kampala. However, the company is currently facing an overall deficit of 34.7 MUSD, hampering its capability to act. In addition, the government and KCCA are engaging private operators to develop the use of e-mobility and reach the target of 50 % electric vehicles in the new fleet of

vehicles and motorcycles in circulation by 2030. The Ministry of Transport has signed an MoU with Spiro of Benin, the African market leader, to deploy more than 140,000 electric motorcycles on the Ugandan market over the next five years, as well as more than 3,000 battery recharging stations throughout the country. For private companies, the Ugandan market is strategic for several reasons: (i) market depth (400,000 motorcycles in circulation and 12,000 imported per month), (ii) political stability, (iii) competitive electricity costs.

In terms of taxation, the government has been encouraging the import of electric and hybrid vehicles since 2023, by exempting these vehicles from import taxes. No information is available as to whether this measure, initially planned for one year, will be extended. The government is also encouraging local production of electric vehicles through tax exemptions, including vehicle registration tax exemptions.

High investment costs and limited infrastructure are the main obstacles to the development of e-mobility. E-mobility companies, often start-ups, face difficulties in **securing financing (capital and debt)** and **convincing investors** of the relevance of their sector and business model. In addition to difficulties on the supply side, there are challenges on the demand side, notably linked to **reluctance to change** among customers accustomed to diesel vehicles, and a lack of awareness of off-grid charging stations.

Despite the challenges, the Ugandan market presents opportunities for French companies. The French co-founded start-up **Zembo** is one of three start-ups (Gogo, Zembo and Mojo Energies) dominating the market for electric vehicles, mainly two-wheelers. The start-up, which rents and sells electric motorcycles on a B2B basis, has commissioned a fleet of **600 motobikes** and deployed **30 charging stations** in the Kampala metropolitan area. The **CFAO** and **Motorcare** groups are also investing in hybrid and electric vehicles. **Total Energies** is exploring recharging solutions, with the ambition of installing charging stations at its service stations. **French companies can capitalize on the market's growth potential by contributing to the expansion of recharging infrastructures** and offering locally adapted solutions.

In Rwanda, the transition to e-mobility is gathering pace, spurred on by a proactive government and the interest shown by companies, particularly in electric motorcycles

The complete transition to a fleet of electric cars and the necessary infrastructure is estimated at \$900 million. This transition would be an effective lever for Rwanda to reach **its target of reducing green house gas emissions by 38 % by 2030 compared with the reference scenario**. In terms of taxation, Rwanda **exempts imports of electric cars, batteries, spare parts and recharging equipment from excise duty**. These same products are also subject to **zero-rated VAT**.

E-mobility is still underdeveloped in Rwanda. In 2019, there were 221,000 vehicles registered in Kenya, of which 52 % were motorcycles and 38 % buses and minibuses, and very few electric vehicles. By the end of 2022, 2.8 % of registered motorcycles were electric.

Rwanda has defined quantified targets for the transition of its thermal fleet to electric power by 2030. According to the **Rwanda Environment Management Authority (REMA)**, converting 20 % of its public transport fleet by 2030 would reduce emissions from this sector by 72,000 tonnes of carbon. The transition targets for motorcycles, cars and minibuses are **30 %**, **8 %** and **25 %** respectively.

The transition of the motorcycle fleet is likely to be carried out by Rwandan companies. This is considered a priority by the Rwandan authorities, as two-wheelers are the country's main means of individual transport : only 2 % of the population own a car, as its cost is unaffordable for almost all households. **Ampersand, Safi and Rwanda Electric Mobility are very active in this sector.** **Ampersand** recently teamed up with **Chinese bus and battery giant BYD** to bring **40,000 new electric motorcycles to market by 2026**. Ampersand received a loan of **\$274 million from the Rwanda Green Fund** at the end of 2023 to accelerate its expansion in Rwanda and Kenya.

The Chinese bid seems to be the best positioned of the foreign companies to meet Rwanda's demand for electrification of its road fleet. **BasiGo**, a Chinese bus assembly company based in Kenya and Rwanda, is **one of the main suppliers of rolling stock to Rwandan bus operators**. In **March 2023**, the company announced that **132 buses were awaiting delivery**.

In Ethiopia, the development of e-mobility is supported by the federal government and can rely on a low-carbon energy resource

The federal government is pursuing a policy of transitioning the vehicle fleet to electric vehicles. In 2022, the Ministry of Finance decided to **exempt electric cars from excise duty and VAT**. Local assembly of electric cars was encouraged by the **total exemption from customs duties for cars completely assembled in Ethiopia**. A customs duty of **5 %** remains for imported semi-assembled cars, and **15 %** for ready-to-run cars. On the other hand, since January 29, 2024, the government has banned the import of cars with internal combustion engines.

This policy, whose stated aim is to enable the country to align its carbon trajectory with the Paris agreements, also aims to **reduce the country's dependence on hydrocarbon imports** and the pressure on its external balance. The country currently spends more than **4.0 bn USD per year (2022/2023)** on these imports, although its dollar revenues are limited. In addition, the country's large electrical capacity (**5 692 MW in 2023**), 100% renewable, coupled with the very low cost of electricity, could benefit the development of e-mobility. However, regular power cuts on the grid are a major obstacle to the development of the sector.

With a fleet of **just 1.2 million vehicles** in Ethiopia, most of which are over 20 years old and concentrated in the capital, the challenge for the country is to launch the **transition to e-mobility without having to renew the thermal fleet**.

The creation of local assembly plants has begun. In 2020, former marathon runner and businessman Haile Gebresellasie set up an electric vehicle assembly plant in partnership with South Korean manufacturer **Hyundai**. However, the difficulty of accessing foreign currency to import components has prevented the expected expansion of the plant's activities. **Another plant was inaugurated in early June in the Amhara region**, with the aim of assembling **1,000 vehicles a year**.

There is little information available on the number of electric buses in circulation or on order. However, demand for these eco-buses is set to grow. The BRT network will need to equip itself with electric buses over the next few years. The **Addis Ababa BRT 2 line**, financed by the **AFD**, is expected to operate with **343 electric buses**, although neither the funds nor the suppliers have been identified. To meet this demand, the Chinese bid is the best positioned, benefiting from competitive pricing.

Public charging infrastructures are virtually non-existent today, due to a lack of appropriate regulations (applicable tariffs, high taxes on the import of charging stations, safety standards, guaranteed electricity supply, quality standards). At the beginning of June, the French energy regulator concluded a consultation process with institutional and private stakeholders in the sector, with a view to drawing up a suitable regulatory framework that will provide incentives. In June 2024, **Total Energies** inaugurated the first fast, public electric charging station in the capital, at one of its 150 local service stations.

In Mauritius, the e-mobility sector is still underdeveloped despite a level of economic and social development well above that of the continent

With its **Green Mauritius vision**, the Mauritian government is committed to **reducing greenhouse gas emissions by 40 % by 2040**. In this context, it is implementing **policies to support the transition of the vehicle fleet to electric vehicles**. Based on the findings of the **10-year electric car integration roadmap** published at the end of 2020, the following measures have been taken: (i) exemption from import tax and VAT on electric vehicles, (ii) installation of public charging stations in towns and (iii) subsidies for the purchase of electric vehicles.

E-mobility is currently underdeveloped in Mauritius, although it has been growing since 2022. 2,500 electric vehicles are currently registered on the island, i.e. ~0.5 % of all registered vehicles, and 1,800 have been registered since 2022. The share of hybrid vehicles is higher (~6 %, 40,000 vehicles) and has been growing since 2022 : 16,778 hybrid vehicles have been registered since 2022. **Of the new hybrid cars registered, ¾ are second-hand, and almost all are Japanese brands** : Toyota, Honda, Suzuki.

To support this transition to electric cars, the country needs recharging infrastructure. A network of public charging stations, known as the **E-motion network**, is spreading across the island, developed by **Vivo Energy Mauritius** and **IBL Energy**. Comprising 21 charging stations in April 2023, the network should reach 30 by 2025,

with a target of 100 by 2030. In this sector, opportunities exist for French companies. **Total Energies** has installed **38 recharging points** on the island, and should reach the **100 mark** by the end of **2025**.

As for public transport, the government is looking to acquire **200 electric buses** to begin the transition of the bus fleet, which is currently entirely thermal. The government's intention is in line with the "**Promoting Low-carbon Electric Public Bus Transport in Mauritius**" project described above.

CONTACT:

Olive NASIBWONDI KABISA

Sectoral Assistant

olive.nasibwondikabisa@dgtresor.gouv.fr

+254 715 277 789 / 020 207 605 573