Clean Technology Hub
energy innovation centre

STUDENT ENERGY

ELECTRIC VEHICLE ADOPTION IN AFRICA

WRITTEN BY : TEAM EVAFRICA

In affiliation with Student Energy
Career Training Program

FEBRUARY,2025.

EXECUTIVE SUMMARY

Africa stands at a critical point in its transition to sustainable mobility. As the continent grapples with urbanization, climate change, and economic challenges, Electric Vehicles (EVs) present a unique opportunity to decarbonize the transportation sector significantly.

According to IEA, Africa's transport sector alone accounts for about 43% of the continent's total emissions, primarily from the combustion of fossil fuels. Hence, an urgent need for the decarbonization of the sector.

Africa's vast mineral wealth, including cobalt, manganese, lithium, and phosphate, critical for EV battery production, positions the continent as a very important player in the global clean energy supply chain. However, unlocking this potential requires overcoming challenges like sparse and fragmented data, inconsistent policies, inadequate infrastructure, and geopolitical complexities.

This research aims to address these gaps by compiling data and mapping out recent stakeholders within Africa's E-mobility space, with a focus on **7 major African countries (Morocco, Tanzania, Rwanda, Ghana, Nigeria, Angola, and South Africa).** The data and information will serve as the basis for developing a regional ecosystem of e-mobility players in Africa.

Through the compiled information and data, we aim to empower investors, decision-makers, and key players such as policy makers who through this and other similar research would be better equipped to formulate evidence-based policies, drive strategic investments in sustainable infrastructure, foster cross-sector collaboration, and accelerate Africa's transition to a resilient, inclusive, and globally competitive e-mobility ecosystem.

TEAM EV AFRICA:

FAVOUR OGUIBE
OBAKENG MAKAPANE
ABDULLAHI OYELAKIN
ASHINZE EMMANUEL

GLOSSARY

Term / Acronym	Definition
AC Charging Station	Alternating Current charging stations that deliver power to EVs at slower rates compared to DC, typically used for home or overnight charging.
BEV (Battery Electric Vehicle)	A fully electric vehicle powered exclusively by a rechargeable battery, with no internal combustion engine.
CAGR (Compound Annual Growth Rate)	The average annual growth rate of a market over a specified period, used to project EV market expansion (e.g., Morocco's 24% CAGR from 2024–2030).
CO_2e (Carbon Dioxide Equivalent)	A metric used to compare emissions from various greenhouse gases based on their global warming potential.
DC Charging Station	Direct Current charging stations that provide faster charging speeds, suitable for public or highway use.
EV (Electric Vehicle)	A vehicle powered fully or partially by electricity, including BEVs, HEVs, and PHEVs.
FENELEC (National Federation of Electricity, Electronics and Renewable Energy)	A Moroccan organization promoting sustainable energy practices and supporting EV infrastructure development.
GHG (Greenhouse Gas)	Gases like CO_2 that trap heat in the atmosphere; transportation is a major contributor in many African countries.
HEV (Hybrid Electric Vehicle)	A vehicle combining an internal combustion engine with an electric motor, not rechargeable via the grid.
LFP Battery (Lithium Iron Phosphate)	A type of lithium-ion battery using phosphate, favored for safety and cost-effectiveness; Morocco has significant phosphate reserves.

GLOSSARY

Term / Acronym	Definition
ICE (Internal Combustion Engine)	Traditional vehicles powered by fossil fuels (petrol/diesel).
Import Duties	Taxes imposed on imported goods; high duties in Nigeria and South Africa hinder EV affordability.
NADDC (National Automotive Design and Development Council)	Nigerian agency promoting local EV production and infrastructure.
Battery Swap	A system where depleted EV batteries are replaced with pre-charged ones at stations, eliminating charging wait times.
NDC (Nationally Determined Contribution)	Climate action plans under the Paris Agreement
CNG (Compressed Natural Gas)	A transitional fuel used in vehicles as an alternative to petrol/diesel, emitting fewer pollutants.
PHEV (Plug-in Hybrid Electric Vehicle)	Hybrid vehicles with rechargeable batteries, combining electric and fuel-based propulsion.
PPP (Public-Private Partnership)	Collaborative projects between governments and private companies.
Range Anxiety	Fear of EVs running out of charge before reaching a charging station, cited as a barrier in Morocco and Nigeria.
Renewable Energy Integration	Incorporating solar, wind, or hydropower into EV charging infrastructure to reduce grid reliance.

MOROCCO

INTRODUCTION

Morocco has established itself as a leading player in Africa's automotive industry, leveraging its strategic location, skilled workforce, and pro-business policies to attract substantial investments in car manufacturing. The automotive sector is a major contributor to Morocco's economy, accounting for 22% of the GDP and generating $14 billion in exports annually [1]

Part of the country's plan is to have EVs represent up to 60% of car exports by 2030. Ongoing investments manufacturing ambitions. could in expedite battery these ambitions.

BACKGROUND OF MOROCCO'S EV LANDSCAPE

landscape Morocco's EV fleet includes more than 10,000 hybrid vehicles, 400 electric vehicles, and 12 electric buses as of 2022 [2]. Of this fleet, 96% consists of ICE (Internal Combustion Engine) vehicles. Morocco faces significant challenges in CO2 emissions, with the country's major source of CO2 emissions from electricity generation (48% of total emissions), and the second highest source of generation from transportation (26%) according to IEA. The national electricity emission factor (EF) is 0.729 kg CO2e per kWh, which means that for every kilowatt-hour (kWh) of electricity generated, 0.729 kilograms of CO_2 equivalent (CO_2e) are emitted into the atmosphere, classifying Morocco as a high-emission environment for EVs [3].

MOROCCO'S TRANSPORTATION DEMANDS

Morocco's transportation demands are different for both urban and rural locations. The expansion of urban centers like Casablanca and Rabat results in heavy mobility pressures caused by rapid population growth. Daily passenger movements in Rabat are expected to increase from the initial 1.49 million in 2014 to 1.94 million in 2024 while major cities like Casablanca will see a rise from 7.8m in 2019 to 10m by 2030. These cities rely on buses, taxis, and emerging ride-hailing services like Careem and Heetch, but these public transport infrastructures are always heavily stressed out due to overcrowding and aging fleets [4].

On the other hand, limited connectivity in rural areas is a major limitation to transport infrastructure. Poor road networks further exacerbate mobility issues, leaving many rural communities underserved. The disparity between urban and rural areas outlines the necessity of better transportation infrastructure to address Morocco's complex mobility necessities [5]

---

[1]https://apnews.com/article/morocco-automobile-industry-electric-vehicles 2981a049578c411b95b525752d243f93

[2]https://www.adm.co.ma/sites/default/files/2022-10/s ession-1_badr-ikken_irf-cimd-conference-2022.pdf

[3]https://scopesdata.com/sustainability-country-inform ation/morocco-2023

[4]OxfordBusinessGroup, Moroccan cities face challenges in urban mobility

[5]https://blogs.worldbank.org/en/arabvoices/getting-ar ound-moroccan-cities-are-you-ready-challenge

E-MOBILITY CLIMATE

As previously stated, as of 2022, Morocco's EV fleet comprised more than 10,000 hybrid vehicles (HEVs), 400 electric vehicles, and 12 electric buses, putting Morocco as one of the key players in the African EV sector. Furthermore, as of 2021, there were about 1,000 two/three-wheelers in the country [6]. Despite this progress, the Moroccan electric vehicle market is projected to grow at a CAGR of 24% from 2024 to 2030 indicating the robust growth of Morocco's EV sector [7].

The major reason HEVs are more popular than EVs is due to Morocco's emission profile. Due to the high emission from electricity generation, the shift towards BEVs remains difficult as the current charging infrastructure is mostly powered by the grid. Although BEVs themselves do not emit C02, the process of charging them through grid electricity leads to indirect emissions (scope 2 emissions) which can be substantial. This reduces the emission advantage of BEVs over Internal Combustion Engine (ICE) vehicles.

As a result, Hybrid Electric Vehicles (HEVs) are currently recommended as an interim solution for reducing transport emissions. HEVs have two complementary propulsion systems: a combustion engine with a fuel tank and an electric motor with a battery.

HEVs cannot be recharged from the electrical grid and use the combustion engine as the primary power source. A gradual shift to BEVs would become more viable with advancements in renewable energy sources, such as solar-powered charging infrastructure [3].

As for sales, Morocco recorded 463 electric vehicles sold so far in 2024, with projections to reach 900 sales by the end of the year. In comparison, hybrid vehicles (HEVs) saw 6,141 sales in 2023 and is expected to rise to 7,500 by the end of 2024 as well[8]. The sales of EVs have not been as high as they should majorly due to the lack of adequate charging infrastructure. Many potential buyers are hesitant to invest in EVs due to concerns about the availability of charging stations. Consumers fear that if their vehicle batteries run low, they may not find a nearby charging station, leading to range anxiety and reluctance to switch from traditional gasoline-powered vehicles[9].

Despite the setbacks, Morocco has ambitious plans. The country already has a production capacity of 40,000 electric cars per year, and it aims to increase it to 100,000 by 2025, according to the Moroccan Minister of Trade and Industry, Ryad Mezzour. To go even further in its strategy, Morocco is making investments in its existing factories but also

---

[6]https://openknowledge.worldbank.org/server/api/cor e/bitstreams/c3c5e12b-197a-4f66-9e003dc94bf46706 /content

[7]https://www.6wresearch.com/industry-report/morocc o-electric-vehicle-market

[8]https://www.statista.com/statistics/1496446/number of-hybrid-and-electric-cars-sold-in-morocco/

[9]https://www.mckinsey.com/features/mckinsey-center for-future-mobility/our-insights/exploring-consumer-se ntiment-on-electric-vehicle-charging

New industrial zones specialising in the production of electric batteries. Morocco has already signed agreements with foreign companies to construct electric battery gigafactories on its soil [10].

INFRASTRUCTURE DEVELOPMENT

Various sources have reported different numbers of charging stations in Morocco, but most sources show that there are currently about 150 charging stations in Morocco. This number is extremely low for a country with a rapidly growing populace and increasing demand for transportation infrastructure. As a result, consumers would instead stick with internal combustion engines, leading to a minimal adoption rate of BEVs, with only 0.3% of vehicles being BEVs in 2023 [3][6].

According to Statista, Morocco currently has around 1500 AC (Alternating Current) stations for electric vehicles and approximately 100 DC (Direct Current) stations, most of which are located in major cities [11]. This info contradicts the 150 EV charging stations stated in some sources, although another source tallies with Statista's report that there are about 1,000 charging stations in Morocco [10].

Morocco's Intersectorial Association for Electric Mobility (APIME), a state institution created in 2023 that aims to accelerate the adoption of electric mobility solutions to tackle the issue of emissions from transportation, announced the installation of 2,500 new charging stations in major cities like Tangier, Rabat, and Casablanca by 2026. This motive is supported by the National Federation of Electricity, Electronics and (FENELEC)[12,13].

Renewable Energy Barriers to EV Adoption in Morocco According to a study by RMI, the barriers to EV adoption are classified into four categories- Availability, affordability, convenience, and awareness[14]. Availability refers to the country's dependence on imported ICE vehicles and much fewer local EV manufacturing. Affordability refers to the high upfront costs associated with owning an EV, and the lack of incentives and policies to help subsidize EV costs.

Convenience refers to the lack of adequate charging infrastructure. Customers would rather purchase ICE vehicles because of how easy it is to purchase gasoline to refuel their tanks as opposed to the hassle of having to locate the nearest EV charging station. Awareness refers to low consumer awareness of EVs and their associated benefits.

In Morocco, some of the main barriers to

[10]https://www.sneci.com/en/morocco-a-rising-star-in-t he-electric-car-industry/

[11]https://www.statista.com/statistics/1493537/electric vehicle-charging-stations-by-type-in-morocco/

[12]https://www.afrik21.africa/en/morocco-2500-chargin g-stations-to-be-installed-by-2026/

[13]https://www.electrive.com/2023/03/31/morocco-to build-2500-charging-stations-by-2026/

[14]https://rmi.org/wp-content/uploads/dlm_uploads/2024/09/a_vision_for_e_mobility_in_nigeria_report-1.pdf

EV adoption has been said to be the lack of adequate charging infrastructure (convenience), financial barriers and lack of incentives related to battery electric vehicles.

Convenience

This is one of the major reasons behind EV adoption in Morocco. Morocco is a country well positioned for the transition to EVs due to the presence of manufacturing giants like Renault, BYD, and Stellantis, and its abundance of mineral resources. Morocco is home to many of the minerals critical for the manufacturing of batteries, including cobalt and manganese. It also sits on almost three-quarters of the world's phosphate rock reserves making the country very attractive to battery manufacturers [15] (EV factory).

However, the country is greatly lacking in its charging infrastructure. As mentioned previously, there are only about 150 charging stations nationwide. The lack of adequate charging infrastructure makes the populace unwilling to switch to EVs, as customers will want charging their EVs to be as convenient as refilling their gasoline tanks. Morocco however recognizes this challenge and seeks to expand available charging infrastructure.

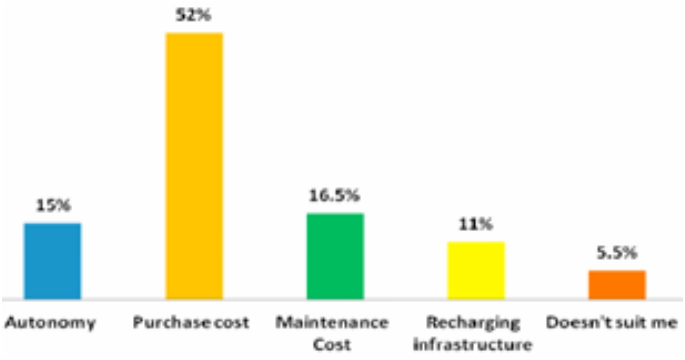
Affordability

Affordability is another major factor hindering the adoption of EVs in Morocco. Despite the government's efforts to reduce import duties to make these vehicles more affordable, the upfront costs remain prohibitively high. The costs of conventional ICE vehicles remain cheaper and much more affordable for customers.

There are hopes that with more local manufacturing of EVs by companies such as Renault, BYD, the costs of EVs will become more affordable. A research carried out a socio-economic analysis of EVs in Morocco, and the research shows that of the residents interviewed, 73.2% believed that the purchase costs of an electric car is high [16].

The research also shows that the perceived maintenance costs of EVs is also a limitation, as 9 out of 10 Moroccan respondents believed that the maintenance cost associated with electric vehicles is too high.

This puts purchase costs and maintenance costs as the major financial barriers hindering the adoption of EVs in Morocco.



[15]https://www.agbi.com/manufacturing/2024/06/moro cco-signs-chinese-deal-to-build-ev-battery-factory/

[16]https://www.researchgate.net/publication/321941967_Socioeconomic_Analysis_of_Electric_Vehicles_in_M orocco

[17]https://resilient.digital-africa.co/en/blog/2024/03/21 /i-smart-pioneering-electric-vehicle-charging-infrastruc ture-in-morocco/

STAKEHOLDERS IN MOROCCO'S EV SECTOR

Several key stakeholders are involved in Morocco's EV landscape. Some of which include:

1. The Ministry of Energy Transition and Sustainable Development plays a crucial role in formulating policies and regulations.

2. The National Federation of Electricity, Electronics and Renewable Energy (FENELEC): plays a pivotal role in Morocco's transition to electric vehicles stakeholder (EVs) by facilitating collaboration, promoting sustainable energy practices, and supporting the development of necessary infrastructure.

3. I-Smart: Companies like I-Smart are pioneering charging infrastructure development, aiming to produce over 5,000 charging stations annually. In 2021, the start-up established Morocco's first EV charging station in Ben Guerir in 2020. Known as "iSmart," this station has a 50kW capacity and charges vehicles in 30 minutes.[17,18]

4. Tesla: In 2021, the world's largest electric car manufacturer Tesla installed several charging stations throughout Casablanca.

5. Supporting the ambitions in Morocco, the **Netherlands Enterprise Agency** (an executive body of the Dutch government) commissioned a consulting firm (EVConsult) to help Morocco's policy makers develop a roadmap for the country's drive to more electrical vehicle charging points.

6. Green Energy Park: is an international platform for testing, research, and training in solar energy and new technologies, based in Benguerir, Morocco. It was developed by the Institute for Research in Solar Energy and New Energies (IRESEN), a Moroccan Research Institute for Solar Energy. They established a partnership with Vivo Energy Maroc, the commercial representative of the oil company Shell. Both companies reached an agreement in 2023 for the deployment of technologies and charging stations for electric vehicles in Morocco[19].

7. National Office of Electricity and Drinking Water (ONEE): as a key player in the energy transition in Morocco and as a benchmark national operator of the electricity market, ONEE aims to make electric mobility an important component of its strategy and to be a major player in its promotion and development.

8. Eaton: is an American-Irish company with strong presence in Morocco's EV sector. Just recently, the company unveiled its Made-in-Morocco EV charging station, manufactured and assembled at its Casablanca plant in the MidParc site, Nouaceur region. It's EV station operates at power levels ranging from 3.7kW to 22kW. The station also has remote monitoring capabilities and can be quickly installed in 20 minutes. With a $12 million investment and over 550 workers, Eaton has huge potentials to transform Morocco's EV sector.[20]

---

[18]https://www.afrik21.africa/en/morocco-green-energy-park-to-provide-solar-solutions-for-electric-mobility/

[19]https://theelectricityhub.com/green-energy-park-to-p rovide-solar-solutions-for-electric-mobility-in-morocco/

[20]https://www.moroccoworldnews.com/2023/11/3589 85/eaton-unveils-its-newest-made-in-morocco-ev-char ging-stations

9. Iskraemeco: Iskraemeco has made significant strides in Morocco's EV sector through its innovative e-mobility solutions. Partnering with OKSA, Iskraemeco has deployed its first EV charging infrastructure in 2024, installing five chargers between (GlowBox and PublicBox), and plans to expand to twenty AC and DC chargers, targeting hotels and shopping malls across Morocco.

AUTOMOTIVE MANUFACTURERS

Major players in Morocco's automotive sector are increasingly focusing on electric vehicle production as part of their sustainability initiatives. Some of them include:

a) Renault: Renault has established a strong manufacturing presence in Morocco, producing various models, including electric vehicles. Since its establishment in 2012, the Renault automotive group has already produced around 2.4 million vehicles. Renault's Tangier factory is set to play a crucial role in Morocco's electric vehicle (EV) landscape by producing the Mobilize Duo, an innovative two-seater electric vehicle. The Mobilize Duo is scheduled to begin production in October 2023 at Renault's Tangier facility. It will be equipped with smartphone-assisted driving software and a battery exchange recharging system, allowing for convenient charging options. To support its EV production, Renault has signed agreements with local suppliers, including a partnership with a Moroccan mining company called Managem to secure cobalt for battery production. This collaboration aims to deliver 5,000 tonnes of cobalt sulfate annually from 2025 to 2027, enhancing local battery manufacturing capabilities[21].

b) Vital Auto Parts: In 2023, Vital Auto Parts, a Moroccan company specializing in automotive equipment, partnered with the Spanish supplier Wallbox Chargers to install and market 50 electric vehicle (EV) charging stations in Rabbat, Morocco, an initiative part a broader effort to enhance the country's electric mobility infrastructure. The installations will include digital solutions, such as a mobile application that allows EV drivers to monitor their consumption data [22, 23].

c) Stellantis: Stellantis operates a factory in Kenitra, producing vehicles under several brands, including Peugeot and Citroën. They signed a partnership with the government to produce electric vehicles, some of which include the Citroën Ami vehicles, a two-seater, which has a power of 6 kW on its 5.5 kWh lithium-ion battery. In 2022, the Barid Al Maghrib Post Office acquired 225 Citroën Ami electric vehicles for use in parcel and mail distribution across Morocco.[24]

TECHNOLOGICAL ADVANCEMENTS

(1) EVConsult, a firm contracted by Netherlands Enterprise Agency to help

---

[21]www.afrik21.africa

[22]https://www.afrik21.africa/en/morocco-vital-auto-an d-wallbox-to-install-50-ev-charging-stations-in-rabat/

[23]https://born2invest.com/articles/charging-stations-for-electric-vehicles-in-morocco/

[24]https://www.afrik21.africa/en/morocco-the-post-offic e-goes-green-with-225-citroen-ami/

with a roadmap for the country's drive to more electrical vehicle charging points are proposing a proposal for the fast-charging network. EVConsult states that Morocco has only 120 charging stations, including just five fast chargers, with a ratio of one charger per 4.6 million residents. As a result, EV adoption is under 1%. The consulting firm has proposed both short-term and long-term goals:

Short-term Goals (Up to 2025): Establish a proposal for fast charging locations, initiate tenders for electric public transport and create a centralized body to coordinate actions and knowledge sharing across stakeholders.

Long-term Goals (2025-2030): Transition to a public-private hybrid market model, where the government leads the initial infrastructure roll-out, with private entities gradually taking over operational roles. [25]

INTERNATIONAL PARTNERSHIPS AND CROSS COUNTRY COLLABORATIONS

China: Morocco is making great moves in terms of cross country collaborations, and most notably is the collaboration with the Chinese EV battery companies. This is majorly due to the US Inflation Reduction Act signed in 2022. Chinese companies are investing heavily in Morocco, also due to the country's abundance of minerals used in EV battery manufacturing. Chinese companies like CNGR, Gotion High-Tech, Youshan, BTR Group, among others have signed billion Dollar investments with the Morocco government to develop Morocco's EV sector, and export these products for sale in the United States as well.

Saudi Arabia: established Saudi Arabia has also relevant partnerships with Morocco, recognisng the nation's potential in the EV space. Most notably is Saudi's energy giant, Acwa Power who has partnered with the Moroccan subsidiary of Gotion Power Morocco. Both companies will partner to build a $800 million 500MW wind power plant with battery energy storage systems, which will be used to power the upcoming EV battery gigafactory to be built in Kenitra, Morocco[26].

Nigeria: Morocco has aslo secured partnerships with Nigeria, one of the major players in Africa's EV space. The collaboration is primarily championed by Nigeria's National Automotive Design and Development Council (NADDC), an organisation which aims to increase EV adoption across Nigeria. The aim of the collaboration is to help Nigeria develop its own electric vehicle industry rather than relying on imports. Nigeria's automotive council is working with Moroccan companies like E-move to start building affordable electric motorcycles and batteries on Nigerian soil. The Moroccans have already figured out how to do this cost-effectively, so they're sharing their know-how with Nigerian manufacturers [27].

[25] https://www.consultancy-me.com/news/5479/consultants-help-morocco-with-ev-charging-infrastructure-roadmap

[26]https://www.moroccoworldnews.com/2024/11/366088/acwa-power-gotion-morocco-launch-800-million-wind-project-for-ev-gigafactory

[27]https://empowerafrica.com/nigeria-partners-with-mo roccan-firm-to-boost-local-electric-vehicle-production/ (Nigeria collaboration)

POLICIES AND TAX INCENTIVES FACILITATING EV ADOPTION IN MOROCCO

1. National Master Plan for Electric Mobility: The National Office of Electricity and Drinking Water (ONEE) is developing the country's first national electric mobility plan in partnership with Institut de la Francophonie pour le Développement Durable (IFDD) and the Global Sustainable Electricity Partnership (GSEP).

The new national plan will help the government address and mobilize all actors and stakeholders of the transportation ecosystem, ultimately helping Morocco build innovative infrastructure to achieve its sustainable development goals [28].

The plan adapts the "Global Macro Roadmap for Transport Transformation" by the Paris Process on Mobility and Climate (PPMC) to fit Morocco's specific needs. The contract was awarded to a consulting firm called BIP/EMC with a budget of MAD 3.28 million ($366,202) [29]. So far, nothing has been heard about the development plan's progress.

2. In 2017, Morocco introduced a VAT reduction for importers and distributors of ecological cars. Import duties have been reduced to 2.5% for hybrid and electric vehicles. The latter are also exempt from the tax on luxury goods and the road tax[30,31].

3. US Inflation Reduction Act: Following the signing of the U.S. Inflation Reduction Act (IRA) in Aug 2022, which provides subsidies to its citizens for EVs that avoid critical components from "foreign entities of concern" like China, Chinese EV battery manufacturers have redirected investments to Morocco. This strategy allows Chinese companies to tap into the lucrative U.S. EV market by leveraging Morocco's free trade agreements with the U.S.

Below are the investments made by Chinese EV companies:

- **CNGR:** $2 billion battery cathode production base in partnership with Morocco's Al Mada Group.
- **Gotion High-Tech:** $6.4 billion for Africa's first EV battery factory, emphasizing Morocco's role as a continental EV production hub.
- **Youshan (LG Chem and Huayou Cobalt):** Joint venture focused on supplying the North American market with cathode materials, structured to comply with U.S. regulations.
- **BTR Group:** New cathode factory investment that notes Morocco's advantageous trade agreements with the U.S. and Europe. [32]

---

[28]https://www.afrik21.africa/en/morocco-faced-with-pollution-a-coalition-for-electric-mobility-is-born/

[29]https://www.moroccoworldnews.com/2021/07/343597/morocco-s-first-national-plan-for-electric-mobility-is-under-development

[30]adm.co.ma/sites/default/files/2022-10/session-1_ba dr-ikken_irf-cimd-conference-2022.pdf

[31]https://thedocs.worldbank.org/en/doc/006e680515c79d607a63c2a64933b12c-0280012023/original/TK-Note-Transport-Decarbonization-2ndDraft-04Apr2022.pdf

[32]https://www.agbi.com/manufacturing/2024/06/morocco-signs-chinese-deal-to-build-ev-battery-factory/

FINANCIAL STRUCTURES FOR EV ADOPTION

1. In 2023, Morocco's Investment Commission set aside €2 billion for electric mobility adoption. Morocco's new Investment Charter in 2023 allocated €2.9 billion for various sectors, with 71% (€2 billion) specifically earmarked for the development of electric mobility over the next five years. This unprecedented allocation reflects the government's commitment to EV adoption nationwide. The initiative aims to reduce CO_2 emissions, aligning with Morocco's target to cut emissions by 13% by 2030 as part of its Paris Climate Agreement commitments. It is expected to create 4,548 direct and green jobs.[33]

2. The European Union (EU) announced in March 2022, the mobilisation of 1.6 billion euros (a little more than 17 billion Moroccan dirhams) from 2022 to increase by 52% the share of renewable energy in the electricity mix of the Cherifian kingdom by 2025[34]

In March 2024, Morocco signed a historic investment agreement with BTR New Material Group for 3 billion dirhams to establish a cathode production unit for electric vehicle batteries. This project is expected to create over 2,500 jobs and marks a significant step in developing Morocco's EV battery ecosystem[35].

PRIVATE AND PUBLIC INVESTMENT INITIATIVES

As previously mentioned, Chinese investments in Morocco's EV sector are surging, highlighted by Gotion High-Tech's $1.3 billion gigafactory near Rabat, BTR New Material Group's $300 million for battery components, and CNGR Advanced Material's cathode plant in Jorf Lasfar. These investments aim to boost local battery production capabilities.

ECONOMIC IMPORTANCE OF EV ADOPTION IN MOROCCO

Morocco employs more than 230,000 people in the automotive sector with a qualified workforce, and the EV sector is expected to generate an additional 17,000 jobs as the sector develops. This workforce consists highly skilled technicians, engineers, and workers, trained to produce high-quality vehicles [36].

Also, the automotive sector contributes approximately 22% to Morocco's GDP, with exports from this sector reaching around $14 billion annually. This automotive manufacturing giant sitting on an abundance of natural mineral reserve positions Morocco as one of Africa's economic giants [1].

ENVIRONMENTAL IMPLICATIONS OF SWITCHING TO EVs

Electric Vehicles are a clean and sustainablealternative to conventional fossil fuel-powered sources. According to a report by the World Bank, the transition to EVs would drastically reduce CO2 and hydrocarbon emissions in Morocco's transport sector by 2050.

---

[33]https://www.afrik21.africa/en/morocco-the-investme nt-commission-earmarks-e2-billion-for-electric-mobility /

[34]https://theelectricityhub.com/eu-to-provide-e1-6-billi on-for-energy-transition-in-morocco/

[35]https://www.assahifa.com/english/morocco/mad-3-billion-deal-signed-for-electric-vehicle-plant-in-morocco/

[36]https://www.sneci.com/en/morocco-a-rising-star-in-t he-electric-car-industry/

Morocco's anticipated transition to electric vehicles by 2050 is estimated to lower carbon emissions to around 2.6 Mteq CO2 annually, as opposed to over 30 Mteq CO2 annually from cars in the Business-As-Usual scenario. Furthermore, the hydrocarbon demand is predicted to decline by around 2 billion litres of gasoline/per year in tandem with this decrease in GHG emissions [37]. Morocco has ambitious plans to fully decarbonise its transport sector. This is in line with Morocco's Nationally Determined Contribution (NDC) to increase the renewable energy (RE) capacity in its electricity mix to reach 52% of the total by 2030, and 80% by 2050 [38].

STRATEGIC RECOMMENDATIONS FOR MOROCCO'S EV SECTOR

Short-Term Goals

1. Centralized Coordination Body: Morocco should create a dedicated government body to unify Morocco's EV strategy. For example, Morocco could model this after Germany's National Platform for Electric Mobility (NPE), which streamlines policy and industry collaboration. The proposed body would accelerate EV project permits, and also eliminate regulatory challenges needed to achieve unified direction among stakeholders.

2. Charging Infrastructure Development: One major issue hindering EV adoption in Morocco is the huge factor of "convenience." Trust should be built around EVs by making charging as easy as filling a gas tank. The nation should prioritize installing charging stations powered by renewable energy sources and not the unclean grid which is a major contributing factor to Morocco's CO2 emission. Charging stations in major cities like Casablanca, Rabat, Marrakech, Tangier, among others, would facilitate a big shift towards EV adoption in Morocco.

3. Comprehensive Policies and Tax Rebates: One major issue as recorded by Moroccans is high cost associated with purchasing EVs. The government should introduce Introduce tax breaks for EV purchases (e.g., waive VAT or registration fees) and offer rebates for trading in fossil-fuel vehicles. Additionally, more comprehensive policies facilitating the shift to EVs should be established.

Medium to Long-Term Goals

1. Local Battery Production: Morocco sits on 70% of the world's phosphate reserves, and phosphate is the major raw material needed for lithium iron phosphate (LFP) batteries. Factories should be built near mining hubs, partnering with giants like CNGR or Gotion High-Tech (already investing in Morocco). This will greatly reduce import costs, create more jobs, and position Morocco as Africa's battery hub.

2. Research and Development (R&D): Greater attention should be paid to R&D, especially in the higher institutions of learning, turning universities into innovation hubs. The government could fund research on next-gen solid-state batteries and battery swapping technologies to ramp up the number of individuals who would opt for an EV over a gasoline powered vehicle.

---

[37]Transport Decarbonization in Morocco, World Bank Group

[38] https://changing-transport.org/sustainable-mobility with-renewable-energies-in-morocco/

RWANDA

INTRODUCTION

Rwanda's transportation sector predominantly relies on internal combustion engine (ICE) vehicles, contributing significantly to the nation's greenhouse gas (GHG) emissions. With 13% of the country's emissions coming from road transport and 2.02% motorization rate, the current transport infrastructure in Rwanda is heavily dependent on imported fossil fuels, which impacts the environment and the economy due to fluctuating global oil prices[1]. Urban areas, particularly the capital city Kigali, experience higher transportation demands, leading to increased air pollution and traffic congestion[2]. In contrast, rural regions face challenges such as limited access to efficient public transport and infrastructure, highlighting the need for sustainable and accessible transportation solutions across the country. Rwanda is however emerging as a leader in electric vehicle (EV) adoption in Africa, with significant government initiatives and private sector investments aimed at transitioning to electric mobility. This shift is driven by the need to combat air pollution, reduce fuel import costs, and embrace sustainable energy solutions.

CURRENT E-MOBILITY CLIMATE IN RWANDA

Rwanda's electric vehicle (EV) market has experienced rapid growth and transformation in recent years. The number of electric vehicles increased from 19 in 2020 to 515 in 2024 while hybrid cars rose to 7,200[3].

This expansion is supported by government initiatives, including significant reductions in import duties on EVs, fostering a conducive environment for both consumers and investors. The country's EV Market is anticipated to grow significantly, with projections indicating it could reach substantial revenue figures by 2030. The government has also introduced various policies to promote EV adoption, including subsidies for purchasing electric vehicles and reductions in import duties, making EVs more financially accessible to consumers. There has been ongoing efforts to enhance EV infrastructure across the country. For instance, Kabisa has established the largest EV charging network in Rwanda and plans to install numerous charging stations in collaboration with gas station operators.

- **Existing EV Fleet Composition**

  Rwanda's EV fleet consists of two- and three-wheelers, four-wheelers, and buses. Vehicle registration in Rwanda is increasing rapidly, with approximately 270,000 registered vehicles, excluding government and security vehicles. The majority of these are motorcycles (110,000), along with 515 EVs, 6,600 hybrid vehicles, and 5,000 e-motorcycles[4].

---

[1] https://mobilityforesights.com/product/rwanda-electric-vehicle-market/

[2]https://www.6wresearch.com/industry-report/rwanda-electric-vehicle-market

[3] https://www.globalmonitor.us/product/rwanda-automotive-market

[4] https://mobilityforesights.com/product/rwanda-electric-vehicle-market/

EV Adoption Trends and Forecasts

- Rwanda is the first country in Africa and the world to mandate all public transport motorbikes to be electric by January 2025. The Rwandan government is actively encouraging the shift to e-mobility, aiming to reduce reliance on fossil fuels and improve air quality. Projections indicate a continued upward trend in EV adoption, supported by policies such infrastructure as tax incentives and development. The government's strategic paper outlines plans to further integrate electric vehicles into the national transport system.

Public Awareness and Consumer Preference

- Public awareness of electric vehicles in Rwanda is on the rise, influenced by environmental concerns and potential cost savings. Surveys indicate that factors such as environmental impact, cost savings, and charging infrastructure significantly shape consumer perceptions and preferences5. However, the initial purchase cost remains a barrier for many residents, despite lower operating costs associated with EVs. Ongoing efforts by the government and private sector aim to address these challenges through education and incentive programs.

BARRIERS TO EV ADOPTION IN RWANDA

Rwanda's transition to electric vehicles (EVs) is encountering several barriers that could hinder widespread adoption. Addressing these barriers will be crucial for Rwanda as it seeks to promote electric mobility and reduce reliance on fossil fuels while improving air quality in urban areas.

The government's proactive measures, combined with private sector initiatives, will play a vital role in overcoming these challenges.

1. Financial Barriers: The most significant barrier to EV adoption in Rwanda is the high initial purchase 2 cost of electric vehicles. Although operating costs for EVs are lower than for traditional vehicles, the upfront price remains a deterrent for many potential buyers. There is also limited availability of financing options, such as leasing or loans for EV purchases. While there have been reductions in import duties on EVs, the overall cost of acquiring electric vehicles can still be high due to various taxes and fees associated with vehicle ownership.

2. Key Infrastructure Challenges: There are challenges of Insufficient Charging Stations and limited charging options. Charging stations are sparse especially in rural areas, hindering EV adoption outside Kigali. While the grid has Insufficient and unreliable capacity in some regions posing challenges for scaling up infrastructure, there is also a lack of high-capacity DC chargers that limits the adoption of larger EVs, such as buses and trucks. The current charging infrastructure is inadequate to meet the needs of a growing EV market.

3. Technical Skills Gap: Lack of Skilled Workforce: There is a shortage of technical skills and the skilled workforce required to maintain and repair electric vehicles. This gap in expertise could hinder the growth of the EV market as consumers may be hesitant to adopt technology they perceive as complex or difficult to service.

---

[5]https://a.storyblok.com/f/109506/x/4a1d18e69c/rwanda-e_mobility-transition-smi-october-2021.pdf

4. Lack of Sufficient Supporting Policies: While the Rwandan government has introduced some incentive policies for EV adoption, such as lower electricity tariffs for charging, the framework sufficiency lacks and overall the policy needed comprehensive support that addresses all aspects of EV integration into the transport system. The absence of clear regulations regarding emissions standards and vehicle registration can create uncertainty for consumers and businesses considering investments in electric mobility.

5. Public Awareness, Consumer Preference and Mindset Barriers: Public awareness of electric vehicles in Rwanda is on the rise, influenced by environmental concerns and potential cost indicate that savings. factors Surveys such as environmental impact, cost savings, and charging significantly perceptions shape and infrastructure consumer preferences. However, the initial purchase cost remains a barrier for many residents, despite lower operating costs associated with EVs. There are prevalent misconceptions regarding the cost, maintenance, and performance of electric vehicles, which contribute to consumer reluctance. There are also concerns about range and reliability. Potential users often express concerns about the driving range of electric vehicles 3 and the reliability of charging infrastructure, which can deter them from making a purchase decision. Ongoing efforts by the government and private sector aim to address these challenges through education and incentive programs.

6. Energy Supply Constraints: Rwanda faces challenges related to its electricity supply, including reliability issues and blackouts that can last for days. This unreliability raises concerns about the feasibility of owning an electric vehicle that requires consistent access to power for charging.

7. Urban & Rural Divide: Rwandan Urban areas see more progress in e mobility adoption, but rural areas face challenges such as limited access to infrastructure and affordability.

INFRASTRUCTURE DEVELOPMENT IN RWANDA'S EV SECTOR

Rwanda's commitment to developing its EV infrastructure is evident through ongoing government initiatives and active participation from private stakeholders. While there are existing gaps in coverage and service availability, the planned expansions and integration of renewable energy into the charging network will significantly bolster the country's electric mobility landscape in the coming years.

---

[6] https://mobilityforesights.com/product/rwanda-electric-vehicle-market/

A. Existing Charging Infrastructure

- ***Number and Types of Charging Stations***

  Current Facilities: As of late 2024, Rwanda has established:
  - 24 public charging stations for vehicles, which include both AC and DC charging options.
  - 4 direct charging stations specifically for motorcycles.
  - 49 stations that combine traditional charging with facilities. battery-swapping Battery Swapping Stations: SPiro Group has operationalized 30 battery swapping stations, with plans to expand these services beyond Kigali to ensure broader access.

- ***Key Infrastructure Gaps:***

  - **Geographical Coverage:** The existing infrastructure is concentrated in urban areas, leaving rural regions underserved. A master plan aims to ensure that no vehicle travels more than 50 kilometers without access to a charging station, highlighting the need for deployment. more widespread

  - **Limited Charging Options:** Despite the number of stations, there are concerns about the adequacy of fast charging options and the overall availability of charging points, which can lead to range anxiety among potential EV users.

- ***Providers of Infrastructure:***

  - **Government Initiatives:** The Rwandan government, through the Ministry of Infrastructure (MININFRA), is leading efforts to develop a comprehensive master plan for EV charging stations. This includes identifying potential sites and guiding investments in infrastructure.

  - **Private Sector investments in Involvement:** Companies such as SPiro Group, Kabisa, and Meshpower are actively involved in expanding the charging network. They are working on establishing high-standard stations and integrating renewable energy solutions into their operations.

B. Planned Infrastructure Expansion

- **Master Plan Development:** The government is finalizing a master plan that identifies over 226 potential sites for new EV charging infrastructure across the country. This plan focuses on high population density areas and aims to leverage existing petrol stations and commercial buildings for installation.

- **Renewable Energy Integration:** Future plans include integrating renewable energy sources into charging networks. For instance, collaborations between companies like Kabisa and Meshpower aim to pilot solar-powered charging solutions, enhancing resilience and aligning with Rwanda's carbon neutral goals by 2050.

---

[7]https://www.cnbcafrica.com/media/635993840811 2/kabisa-investing-in-rwandas-electric-vehicle-landscape/

- **Expansion Goals:** Kabisa [7] aims to have 38 EV charging stations operational by the end of 2024, ensuring a station every 100 kilometers across the country. This expansion is part of a broader strategy to enhance accessibility and support the transition to electric mobility.

STAKEHOLDERS IN E-MOBILITY IN RWANDA

Rwanda's commitment to electric mobility (e-mobility) involves a diverse array of stakeholders, including government bodies, private sector players, international partners, and non-governmental organizations (NGOs). These stakeholders collectively contribute to Rwanda's growing e-mobility ecosystem through policy development, infrastructure deployment, innovation, and international collaboration.

A. Private Sector Players[8]

i. Automotive Manufacturers:

- **Ampersand** – A leading local e-bike OEM with a 70% market share, over 2,500 e-bikes sold, and 30+ charging stations across Rwanda. The company has raised more than $34 million to date.
- **Rwanda Electric Mobility (REM)** – A local e-bike and e-truck OEM with 500+ e-bikes sold. REM is the only authorized vendor for the safe conversion and retrofitting of existing petrol bikes and operates an active charging network.
- **Kabisa** – A local OEM specializing in electric cars, vans, trucks, and buses. The company boasts Rwanda's largest EV charging network (25 stations) and operates an EV-specific garage for vehicle maintenance and repair.[9]
- I**ZI Electric** – A local e-bus manufacturer with 10+ e-buses in 5operation. The company is actively building an EV ecosystem while also developing a battery maintenance and repair facility.
- **OX Delivers** – A local e-truck manufacturer, recognized for producing the world's first purpose designed electric truck for the Global South. OX Delivers currently operates 20+ vehicles, 4 warehouses, and serves over 2,000 customers.
- **Safi Universal Links Ltd** – A key player in Rwanda's e-mobility sector, operating electric motorcycles and establishing a training center focused on development. e-mobility skills.
- **Volkswagen** – The global automotive giant has introduced electric vehicles, including e-Golfs, into the Rwandan market. Volkswagen's EV rollout is supported by a local charging infrastructure, reinforcing Rwanda's commitment to sustainable mobility.

ii. Charging Infrastructure Providers:

Ampersand and Safi are also key players in deploying charging and battery-swapping stations. Others include: Kabisa, Meshpower, IZI Electric and Basigo[10].

iii. Startups and Local Innovators:

- **GuraRide:** A bike-sharing company transitioning to electric bicycles.
- **eBee and eWaka:** These startups are introducing electric bicycles for both personal use and cargo transport, contributing to sustainable mobility solutions within urban areas.

[8] https://batteryswapcabinet.com/the-rise-and-opportunities-of-rwandas-electric-two-wheeler-market/

[9]https://www.cnbcafrica.com/media/6359938408112/kabisa-investing-in-rwandas-electric-vehicle-landscape/

[10]https://furtherafrica.com/2024/11/25/rwanda-advances-electric-vehicle-charging-infrastructure/

B. International Partnerships and Cross-Country Collaborations

- **Development Partners:** Organizations such as JICA (Japan International Cooperation Agency), KOICA (Korea International Cooperation Agency), and the EU are actively supporting Rwanda's transport sector through funding schemes, training programs, and research initiatives aimed at enhancing e-mobility.
- **GIZ (German Society for International Cooperation):** GIZ collaborates with local stakeholders to promote e-mobility through various initiatives, including training programs aimed at developing local expertise in electric vehicle technology. [11]
- **UNEP:** Supports Rwanda's e mobility initiatives through funding and technical assistance.

C. Local & International NGOs and NPOs

- **ICLEI Africa:** Partners with local authorities to promote sustainable urban mobility, including e-mobility solutions. This organization engages with policymakers and stakeholders to promote sustainable urban mobility solutions, including e-mobility initiatives in Rwanda.
- **S.U.L E Mobility:** This NGO focuses on training young people in e mobility skills, preparing them for careers in this emerging sector while promoting climate-friendly transport solutions.
- **East African Renewable Energy Partnership (EAREP):** Advocates for clean energy solutions, including EV adoption in Rwanda.
- **Sustainable Transport Africa:** Assists in research and development projects aimed at accelerating the e mobility transition.

POLICIES AND REGULATORY FRAMEWORK SUPPORTING E- MOBILITY IN RWANDA

a. National and Regional Policies Supporting E-Mobility

- **Rwanda's National EV Policy:** Introduced in 2021, this policy provides a roadmap for accelerating EV adoption and developing charging infrastructure. It emphasizes the integration of e-mobility into the country's broader green growth strategy and Nationally Determined Contributions (NDCs) under the Paris Agreement.
- **Mandate for Electric Motorbikes:** Starting January 2025, Rwanda will only license electric motorbikes for public transport in Kigali, effectively banning new registrations of petrol powered motorcycles. This landmark decision positions Rwanda as a global leader in e-mobility policy and aims to significantly reduce emissions from the transport sector.

---

[11] https://www.developpp.de/en/projects-success-stories/rwanda-strengthening-prospects-for-climate-friendly-transport-and-green-jobs-through-e-mobility

[12]www.newtimes.co.rw/article/22007/news/rwanda/rwanda-develops-master-plan-for-ev-charging-stations

- **Rwanda EV Master Plan**: Focuses on building a nationwide charging network, incentivizing manufacturing, and EV-promoting electric motorcycles and public transport. Includes targets for electrifying 20% of buses and 30% of motorcycles by 2030[13].
- **Strategic Paper on E-Mobility:** The Rwandan government has developed a comprehensive strategic paper outlining the modalities for accelerating the adoption of electric vehicles. This document emphasises increasing EV penetration, enhancing charging infrastructure access, and raising public awareness about electric mobility[14].

b. Tax Incentives and Subsidies

- Zero VAT and Import Duty Exemptions: The Rwandan government has implemented zero VAT on EV imports and excise duty exemptions for electric vehicles and their components (batteries & charging equipment). The Value added tax (VAT) is reduced or exempted for e-mobility-related imports. This policy aims to lower the financial barriers associated with purchasing electric vehicles.
- Direct financial support for EV manufacturers and businesses deploying charging infrastructure.
- Rent-free government land for charging stations.
- Green license plates for EVs (preferential parking & future congestion exemptions).

c. Policy Gaps:

- Lack of detailed regulations on battery disposal and recycling, raising concerns about sustainability. long-term
- Minimal focus on incentivizing private investments in rural charging infrastructure.
- Absence of robust financing mechanisms for consumers and small businesses to adopt EVs.

d. Recommendations:

- Develop a battery recycling policy to mitigate environmental risks.
- Introduce low-interest loan schemes and microfinancing options to make EVs affordable for low-income groups.
- Expand public-private partnerships to enhance rural charging infrastructure.
- Strengthen regional policy alignment to encourage cross-border EV trade and infrastructure sharing.

---

[13]https://www.electrive.com/2024/12/04/rwanda-announces-master-plan-for-ev-infrastructure/

[14] https://dabafinance.com/en/news/rwanda-bans-new-gasoline-bikes-to-boost-electric-mobility

FINANCIAL STRUCTURES AND INVESTMENTS IN RWANDA'S E MOBILITY SECTOR

Rwanda actively fosters its electric vehicle (EV) market through various financial structures and investment initiatives. Here's an overview of the current landscape, including government funding, private sector investments, international partnerships, and advancements. Technological advancements.

1. Ireme Invest Initiative: The Government of Rwanda has established Ireme Invest, a financing mechanism to support green projects, including e-mobility. This initiative offers concessional loans to local companies engaged in electric mobility, facilitating the introduction of additional electric vehicles into their fleets. For instance, PREV Rwanda Ltd received a loan under this initiative to enhance its electric vehicle leasing operations[14].

2. Green Fund Support: The Rwanda Green Fund has been instrumental in providing grants for projects. For e-mobility, for example, BasiGo Rwanda received a RWF 300 million ($225,000) grant to upgrade its charging infrastructure, while IZI secured a similar amount to expand its fleet of electric buses[15].

3. Private Sector Contributions: Various private companies are investing in the e-mobility sector. BasiGo raised $1.5 million from USAID to expand operations in Rwanda and $3 million from CFAO Group for electric bus production. Similarly, IZI is expanding its fleet with funding from the Rwanda Green Fund and plans to establish a battery maintenance facility in Kigali.[8]

ECONOMIC IMPACTS OF EV ADOPTION IN RWANDA

Rwanda's e-mobility program offers significant economic opportunities and social benefits, particularly for the youth. The direct economic benefits of EV adoption in Rwanda include:

- 20-25% reduction in fuel costs
- 15-20% savings on maintenance expenses 15% annual decrease in oil imports
- Projected national savings of $22 million annually on fuel imports.

Additionally, drivers switching to electric motorcycles are expected to save approximately **$840 per year** in fuel and maintenance costs. The growing EV sector is also expected to attract local investments in assembly plants, stimulate the domestic economy, and benefit from the government's corporate income tax rate of 15% for companies engaged in local manufacturing.

ENVIRONMENTAL BENEFITS

Rwanda's transition to e-mobility brings substantial environmental and public health benefits, contributing to cleaner air, lower emissions, and improved overall well being. Key advantages include[16]:

---

[14] https://africa.iclei.org/project/nama-facility/

[15]https://changing-transport.org/driving-rwandas-green-future/

[16]https://changing-transport.org/driving-rwandas-green-future/

- 40% reduction in urban noise pollution, creating a quieter and more livable environment.
- 60% decrease in transport-related air pollution, significantly improving urban air quality.
- Up to 50% reduction in CO_2 emissions per vehicle, aligning with Rwanda's net-zero emissions target by 2050[17].
- Reduced cases of respiratory diseases and cardiovascular illnesses, leading to lower healthcare costs and a healthier population.

YOUTH'S INVOLVEMENT IN RWANDA'S EV SECTOR

Rwanda's e-mobility sector actively involves youth through various initiatives aimed at skill development, job creation, and fostering innovation. Youths are engaged in this growing field through:

- **Practice-Oriented Training:** Initiatives like the "Boosting E Mobility Jobs" project have been launched to equip young people with the technical skills necessary for the e-mobility sector. In collaboration with partners such as the University of Rwanda and local companies, targeted training programs cover areas such as charging infrastructure, electric motorcycles, and battery technology. As of November 2024, 60 trainees have successfully completed these programs, gaining in-demand skills relevant to the industry.
- **S.U.L E-Mobility Academy:** This academy focuses on training young individuals to become professionals in e-mobility. It offers hands-on skills acquisition and internship programs, preparing youth for careers in electric vehicle manufacturing, maintenance, and service. The program has 9successfully trained over 1,462 individuals, with a significant portion being women.
- **Employment Opportunities:** The growth of the e-mobility sector is creating numerous job opportunities for young people. For instance, S.U.L E-Mobility has generated over 1,045 jobs through its initiatives. The demand for skilled workers in the electric vehicle market is rising, providing a pathway for youth to enter the workforce.
- **Entrepreneurship:** The financial savings associated with transitioning to electric approximately motorcycles — $840 annually— enable young drivers to invest in education or small businesses, fostering entrepreneurship within the community[18].
- **Gender Inclusion:** Efforts are being made to empower women within the e-mobility sector. Training programs are designed to address specific needs and challenges faced by women, promoting their participation in this emerging field.
- **Rural Community Engagement:** The e-mobility initiatives also aim to strengthen rural communities by providing access to training and job opportunities in electric mobility, thereby enhancing economic prospects for young people living outside urban centers.

[17]www.unep.org/news-and-stories/story/face-rising-air-pollution-rwanda-turns-electric-vehicles

[18]https://www.linkedin.com/pulse/top-3-challenges-rwandan-startups-how-overcome-them-tuzanesha--6y9vf

SKILL DEVELOPMENT OPPORTUNITIES FOR YOUTH IN ELECTRIC VEHICLE ADOPTION

The transition to electric vehicles (EVs) presents a wealth of skill development opportunities for youth, particularly in regions like India and Africa where the EV market is rapidly expanding. Various initiatives are being implemented to equip young individuals with the necessary skills to thrive in this evolving sector[19].

- **ISIEINDIA Initiatives:** ISIEINDIA has partnered with leading NGOs to provide vocational training that covers practical technology, skills in EV manufacturing, maintenance, and entrepreneurship. This initiative aims to empower youth by enhancing their employability through specialized training in various aspects of electric vehicles, including service, assembly, and charging station operation.
- **Collaboration with Educational Institutions:** Establishing specialized education and training programs in collaboration with universities and technical schools is crucial. These programs focus on key areas such as battery technology, electric propulsion systems, and automotive engineering.
- **Integration of EV Modules into Existing Courses:** Many technical vocational education and training (TVET) institutions are beginning to integrate EV-specific modules into their curricula. This approach not only updates existing courses but also 10prepares students for emerging job roles in the EV sector.

STRATEGIC RECOMMENDATIONS FOR RWANDA'S EV ADOPTION

Rwanda's success in achieving e-mobility hinges on a phased approach that addresses immediate barriers while building a foundation for long-term sustainability.

a. Short-Term Goals (1–3 Years)

- Fully implement tax exemptions for EV imports and spare parts.
- Introduce time-bound subsidies for EV purchases to boost adoption, especially for electric motorcycles and public transport.
- Launch nationwide campaigns to educate citizens about the environmental and economic benefits of EVs, targeting both urban and rural areas.
- Establish a network of pilot charging stations in Kigali and key regional hubs with a mix of AC and DC fast chargers.
- Offer financial and operational incentives to startups and international firms for local EV assembly and production of parts.
- Partner with educational institutions and technical training centers to address the technical skills gap in EV maintenance and repair.

---

[19] https://www.linkedin.com/pulse/what-investment-opportunities-exist-rwandas-sector-nshimiyimana-3ygff

[20]https://www.efdinitiative.org/sites/default/files/publications/National%20Policy%20Review_2022_Rwanda_Final_0.pdf

b. Medium-Term Goals (3–5 Years)

- Develop a comprehensive national charging network connecting urban centers and highways, with a focus on renewable energy integration (e.g., solar-powered stations).
- Establish clear and enforceable standards for EV safety, charging infrastructure, and battery recycling.
- Partner with global recycling firms to set up battery recycling and second life facilities, reducing e-waste.

c. Long-Term Goals (5+ Years)

- Position Rwanda as a regional leader in EV manufacturing, exporting vehicles and components neighboring countries.
- Transition all charging stations to run on 100% renewable energy, aligning with Rwanda's green growth strategy.
- Mandate the electrification of government and public transportation fleets, including buses and taxis, by 2035.
- Establish regional e-mobility partnerships within the East African Community (EAC) to streamline EV trade, charging compatibility, and policy harmonization.
- Develop a fully circular economy for EV batteries, focusing on local recycling, repurposing, and safe disposal practices.

NIGERIA

INTRODUCTION

Nigeria, Africa's most populous country and largest economy, is poised for a transportation revolution. As the nation struggles with urbanisation, environmental issues, and economic development challenges, the potential for electric vehicles (EVs) to transform its mobility sector is becoming increasingly evident.

BACKGROUND OF NIGERIA'S EV LANDSCAPE

Nigeria's automotive landscape is primarily dominated by internal combustion engine (ICE) vehicles. As of 2021, there were approximately 13 million vehicles on Nigerian roads. Most of these vehicles are powered by fossil fuels, with commercial vehicles accounting for 57.7% and private vehicles making up 40.98% of the total [1].

Nigeria's transition to electric vehicles (EVs) is still in its early stages, but the growth potential is significant. The Nigerian government has set an ambitious 30% EV adoption target by 2025 [2]. This goal is supported by policies such as import duty exemptions for EVs and installing solar-powered charging stations.

Shifting to EVs could reduce CO2 emissions. While specific data for Nigeria are limited, global studies suggest that EVs can reduce emissions by up to 50% compared to conventional vehicles by 2030 [3]

[1]https://bioone.org/journals/environmental-health-insights/volume-16/issue-1/11786302221125039/Decarbonisation-of-the-Transport-Sector-in-Nigeria/10.1177/11786302221125039.full

[2]https://www.6wresearch.com/industry-report/nigeria-electric-vehicle-market

[3]https://novatiaconsulting.com/transportation-and-mobility-studies-in-nigeria/

IMPACT OF NIGERIA'S CURRENT TRANSPORT SECTOR ON CO2 EMISSIONS

Nigeria faces significant challenges that hinder its potential, particularly in transportation. These issues were exacerbated by removing the fuel subsidy in 2023, which caused transportation costs to nearly triple.

Before this change, Nigeria spent $10 billion on oil subsidies in 2022 [4]. While eliminating the subsidy has alleviated some pressure on government finances, it has burdened households Transportation is crucial nationwide. for ongoing development in an economy primarily reliant on oil, gas, and agriculture. However, demand consistently exceeds supply in urban and rural areas.

Nigeria's transport sector is a significant contributor to the country's carbon footprint. According to the International Energy Agency (IEA), the transport sector accounted for about 60% of Nigeria's total CO2 emissions in 2020 [5]. From 1971 to 2014, the Nigerian transport sector contributed an annual average of 48% to total CO2 emissions from fuel combustion1. More recent projections suggest that under a business-as-usual scenario, greenhouse gas emissions from the transport sector could increase by up to 50% by 2035 and almost 100% by 2050 [1].

The road transport subsector is the primary contributor to these emissions. The excessive use of internal combustion engine vehicles, coupled with the combustion of petroleum-based products like petrol (PMS), diesel (AGO), and aviation fuel (ATK), are the main drivers of CO2 emissions in this sector.

[4]https://www.6wresearch.com/industry-report/nigeria-electric-vehicle-market

[5]https://www.sciencedirect.com/science/article/abs/pii/S2352550923000635

TRANSPORTATION NEEDS: URBAN VS RURAL DEMANDS

Due to diversity and economic and cultural differences, Nigeria's transportation needs differ significantly between urban and rural areas.

URBAN TRANSPORTATION DEMANDS

To address these challenges, urban areas require integrated, efficient, and sustainable transportation solutions. Introducing Bus Rapid Transit (BRT) systems, like the one in Lagos, which transports over 400,000 passengers daily [6], demonstrates the potential for improved public transit in urban areas. Transportation challenges are significant in urban centres like Lagos, which has a population of over 20 million. The key issues include:

1. Severe congestion: Lagos's commuters spend an average of 30-40% [6] of their day in traffic.

2. High emission rates: Lagos alone contributes 44,000 kg of carbon dioxide equivalent daily [7] from its mass transit buses.

3. Inadequate public transportation: The existing systems often need to be more relaxed, leading to reliance on informal and less efficient modes of transport.

[6]https://novatiaconsulting.com/transportation-and-mobility-studies-in-nigeria/

RURAL TRANSPORTATION DEMANDS

Rural areas face different but equally pressing transportation challenges:

1. Limited connectivity: Poor transportation infrastructure in many rural communities makes access to essential services inadequate.

2. Reliance on informal transport: Over 60% of rural households depend on informal and often unsafe modes of transport, such as motorcycle taxis.

3. Poor road conditions: Many rural roads are in disrepair, leading to longer travel

The gap in transportation infrastructure between urban and rural areas contributes to economic inequalities and hampers overall development. Tackling these rural mobility issues is essential to promoting inclusive growth and enhancing access to education, healthcare, and economic opportunities.

Nigeria's shift to electric vehicles presents a valuable opportunity to address transportation challenges in urban and rural areas while reducing the country's carbon footprint. However, this transition must be managed carefully to ensure it meets the diverse needs of Nigeria's population and aligns with the country's broader development goals.

[7]https://theenergyyear.com/articles/the-potential-for-electric-vehicles-in-nigeria/

CURRENT E-MOBILITY CLIMATE IN NIGERIA

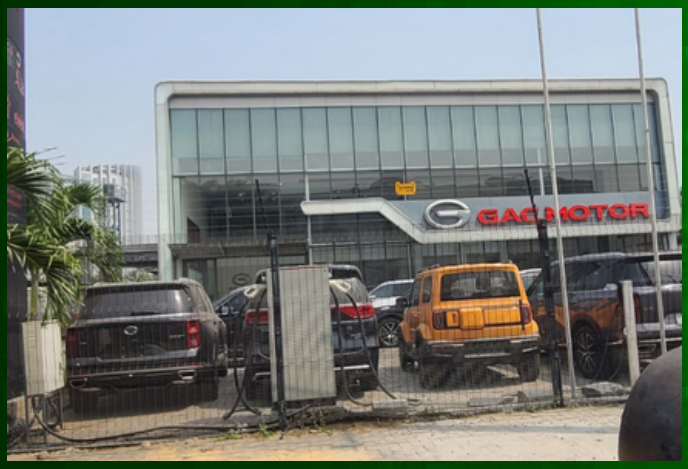
Nigeria's Electric Vehicle (EV) sector is nascent, but government and private enterprises are increasingly interested in promoting sustainable transportation. As of 2018, the National Bureau of Statistics reported approximately 11.8 million vehicles in Nigeria. While precise figures on the current number of EVs are limited, recent developments indicate a positive trajectory toward increased adoption.

The Nigerian Electric Vehicle (EV) market is projected to grow at a compound annual growth rate (CAGR) of 57.9% between 2024 and 2030, driven by government policies, cost reductions in EV production, and increasing public awareness. Nigeria has set ambitious goals for EV adoption, including achieving 30% electric vehicles on its roads by 2025 and full electrification by 2060 as part of its Energy Transition Plan (ETP) [8]. The market is supported by incentives such as import duty exemptions for EVs and investments in solar-powered charging stations. Additionally, removing fuel subsidies is anticipated to stimulate the electric mobility sector by making EVs a more cost-effective alternative to traditional fuel-powered vehicles.

EXISTING EV FLEET COMPOSITION

Nigeria's current EV fleet includes:
Two/Three-Wheelers: Affordable electric motorcycles and tricycles from MAX and Jet Motor Company, popular for urban mobility.

Passenger Cars: There is a limited selection of luxury EVs, such as the Tesla Model X Plaid, Cyber truck, and Mercedes EQE, but high costs hinder widespread adoption, GAC Motors.



Buses: Possible EVS is expanding its fleet of electric buses for mass transit.

Trucks and Vans: Jet Motor Company offers electric cargo vans designed for local conditions. They have a range of around 300 km per charge.

---

[8]https://energytransition.org/2023/11/nigerias-bold-leap-to-boost-e-mobility-and-shrink-its-emissions/

EV ADOPTION TRENDS AND FORECASTS

Public interest in EVs is growing due to rising fuel prices after subsidy removals and increased awareness of environmental benefits. Ride-sharing platforms like Plentywaka also incorporate EVs into their fleets. According to the Afema Data Portal, the EV readiness index in Nigeria is 0.233625. It is low compared to other countries of the world.

Energy Transition Plan (ETP): Aims to deploy 13 million electric vehicles—constituting 60% of the country's total vehicles—by 2050, with a goal of 100% deployment by 2060. [9]

National Automotive Industry Development Plan (NADIP): Targets 30% locally produced electric vehicles by 2030. [10]. The market is expected to expand steadily as infrastructure improves and costs decline. Local manufacturing initiatives by companies like Siltech are reducing import dependency.

Public Awareness and Consumer Preference.

Public awareness of electric vehicles (EVs) remains a challenge in Nigeria, with many unfamiliar with their benefits or harbouring misconceptions. Rising fuel costs are shifting consumer preferences towards more fuel-efficient and alternative-energy vehicles, but affordability is a key factor in adoption. Initiatives like Possible EVS's Electric Vehicle Experience Center aim to educate consumers about EV technology and its benefits.

BARRIERS TO EV ADOPTION IN NIGERIA

Nigeria faces several significant obstacles to adopting electric vehicles (EVs). These challenges cover various aspects of the EV ecosystem, including economic factors, infrastructure, and policy issues.

1. High Upfront Costs

The initial purchase price of EVs is considerably higher than conventional vehicles, making them less accessible to the average Nigerian consumer. This cost disparity is a significant deterrent to widespread adoption.

2. Inadequate Charging Infrastructure

Nigeria has fewer than 15 operational electric vehicle charging stations nationwide, most of which are in Lagos. This limited infrastructure contributes to "range anxiety" among potential users, deterring them from considering EVs as a viable option [11]

3. Inconsistent Electricity Supply

The country's unreliable power grid poses a significant challenge for EV owners who rely on consistent electricity for charging. Frequent power outages and limited access to electricity, especially in rural areas, hinder the practicality of owning an EV.

4. Lack of Government Incentives and Supportive Policies

The absence of comprehensive policies and incentives to encourage EV adoption creates uncertainty for manufacturers and consumers. Supportive regulations, .

---

[9]https://www.seforall.org/news/nigerias-e-mobility-surge-to-lower-emissions-cut-costs-and-spur-economic-growth

[10]https://www.6wresearch.com/industry-report/nigeria-electric-vehicle-market-2020-2026

[11]https://dailytrust.com/is-nigeria-falling-behind-in-africas-electric-mobility-race/

such as tax breaks or subsidies, are essential to foster a conducive environment for the EV market

5. Limited Public Awareness and Misconceptions

Many Nigerians are unaware of electric vehicles or have misconceptions about their performance and utility. This lack of awareness leads to scepticism regarding the feasibility and benefits of EVs in the Nigerian context.

6. Insufficient Skilled Workforce

The transition to e-mobility requires a workforce skilled maintenance, in and EV technology, infrastructure development. Nigeria's renewable energy and EV sectors have a significant skills gap, which hampers the industry's growth and sustainability.

INFRASTRUCTURE DEVELOPMENT

Infrastructure Development for Electric Vehicles in Nigeria

Nigeria is progressively advancing in developing infrastructure to support electric vehicles (EVs), with concerted efforts from both governmental bodies and private enterprises. This section provides a comprehensive overview of the country's current state and plans for EV infrastructure.

Charging Infrastructure

As of January 2025, Nigeria's EV charging infrastructure is in its nascent stages, with several key developments:

- **NNPC and Partners:** In May 2024, the Nigerian National Petroleum Company Limited (NNPCL), in collaboration with Shafa Energy and Nigus International, inaugurated the country's first EV charging station in Abuja. This initiative began a nationwide deployment of EV charging points at filling stations [12].

- **MAX and PASH Global:** In October 2024, MAX, a leading mobility and electric vehicle platform, partnered with PASH Global to invest $10 million in expanding Nigeria's EV infrastructure. This collaboration aims to develop a widespread network of EV charging stations across urban centres, supporting the adoption of electric motorcycles, three-wheelers, and cars [13]

- **Sterling Bank's Project Qoray:** Sterling Bank launched Project Qoray, deploying 120 swap-enabled electric three-wheelers in Kano State and establishing the first fully equipped solar-powered battery swap stations to support the newly deployed EVs.

- CAAS EV has installed fast DC EV chargers in Abuja, capable of recharging most EVs up to 80% in 20-30 minutes.

- The Nigerian National Automotive Design and Development Council (NADDC) has unveiled 100% solar-powered EV charging stations at universities in Sokoto, Lagos, and Nsukka [14].

KEY INFRASTRUCTURE GAPS

Despite these advancements, several challenges persist:

- **Limited Geographical Coverage:** Current

---

[12]https://punchng.com/nnpc-partners-deploy-electric-vehicle-charging-stations

[13]https://www.pashglobal.com/max-and-pash-global-join-forces-to-power-nigerias-clean-mobility-revolution-with-electric-vehicle-charging-network/

[14]https://theelectricityhub.com/project-qoray-leading-ev-expansion-in-nigeria/

charging stations are predominantly located in major urban centers, leaving rural and semi-urban areas underserved

Insufficient Charging Points: The existing number of charging stations is inadequate to support a large-scale adoption of EVs, necessitating further expansion.

Grid Reliability Issues: Nigeria's inconsistent power supply challenges reliable EV charging, highlighting the need for integrating renewable energy sources.

Standardization: The absence of standardized charging protocols and connectors can lead to compatibility issues among EV models and charging stations.

INFRASTRUCTURE PROVIDERS

The development of EV charging infrastructure in Nigeria involves both government initiatives and private sector participation:

Government Initiatives:

- **NNPCL:** Through its subsidiary, NNPC New Energies Limited (NNEL), NNPCL is collaborating with partners to establish EV charging stations nationwide, aiming to promote cleaner energy sources [15]

- The National Automotive Design and Development Council (NADDC) has been involved in setting up solar-powered charging stations at universities.

- The Rural Electrification Agency (REA) is exploring the integration of EV charging with mini-grids in rural areas.

Private Sector Involvement:

- **MAX and PASH Global's** partnership focuses on creating a network of EV charging stations in urban centres, facilitating the transition to sustainable mobility solutions.

- **Sterling Bank's Project Qoray:** By introducing solar-powered battery swap stations, Sterling Bank is addressing the charging needs of electric three-wheelers, contributing to the diversification of charging solutions.

Planned Infrastructure Expansion

To bridge existing gaps and foster EV adoption, several initiatives are underway: Nationwide Expansion: Plans are in place to extend charging infrastructure beyond major cities, ensuring broader accessibility for EV users.

- **Renewable Energy Integration:** Emphasis is being placed on incorporating renewable energy sources, such as solar power, into charging stations to mitigate grid reliability issues and promote sustainability.

- **Public-Private Partnerships:** Collaborations between government agencies and private companies are being encouraged to accelerate the deployment of charging infrastructure across the country.

- **Standardisation Efforts:** Stakeholders are working towards establishing standardised charging protocols to ensure compatibility and streamline the user experience.

---

[15]https://theelectricityhub.com/project-qoray-leading-ev-expansion-in-nigeria/

STAKEHOLDERS IN NIGERIA'S E-MOBILITY SECTOR

Nigeria's e-mobility sector is a dynamic ecosystem comprising various stakeholders, each playing a pivotal role in the transition towards sustainable transportation. These stakeholders include government agencies, private sector participants, financial institutions, non-governmental organisations (NGOs), and international partners.

1. Government Agencies

Energy Transition Office (ETO): The ETO is instrumental in formulating and implementing Nigeria's Energy Transition Plan (ETP), which includes ambitious targets for the adoption of electric vehicles (EVs). In June 2023, the ETO organised an E-Mobility Stakeholder session in Lagos to foster collaboration and address policy constraints in the sector [16].

National Automotive Design and Development Council (NADDC): The NADDC develops policies to promote the local production and adoption of EVs. The council has initiated projects to encourage infrastructure development, such as establishing university solar-powered EV charging stations.

Private Sector Participants

- **Innoson Vehicle Manufacturing (IVM):** As Nigeria's premier indigenous automaker, IVM has ventured into producing electric vehicles, contributing to the diversification of the automotive industry.
- **Jet Motor Company:** Jet Motor Company is pioneering the production of electric delivery trucks in partnership with logistics companies, marking a significant step in commercial e-mobility solutions. They are one of the few companies in Nigeria producing four-wheeled EVs.
- **Electric Motor Vehicle Company (EMVC):** Located in Idah, Kogi State, EMVC manufactures electrically powered vehicles, including the four-seater Adoja, which is promoted as the most environmentally friendly vehicle in Nigeria.
- **CIG Motors:** Partnering with the Lagos State Government to introduce 1,000 electric vehicles.
- **Stallion Motors:** Launched the first locally assembled electric vehicle, the Hyundai Kona.
- **Possible EVS:** Planning to open EV assembly plants to produce up to 10,000 EVs annually.

Financial Institutions

- **Sterling Bank:** Through initiatives like Project Qoray, Sterling Bank invests in deploying electric three-wheelers and establishing solar-powered battery swap stations, facilitating the adoption of e-mobility solutions. The Electric Motor Vehicle Company (EMVC) has attracted $275 million in foreign direct investment to produce EVs in Nigeria.

Non-Governmental Organizations (NGOs) and Research Institutions

- **Clean Technology Hub:** This organisation researches and provides insights into e-mobility in Nigeria, offering recommendations for stakeholders to advance the sector [17].

---

[16]https://www.pulse.ng/news/local/energy-transition-office-hosts-e-mobility-stakeholder-session-in-lagos/szktxmx

- **Renewable Energy Technology Training Institute (RETTI):** RETTI focuses on capacity building and training programs to develop the skilled workforce necessary for the e-mobility industry.

International Partners

- **Sustainable Energy for All (SEforALL):** In collaboration with Nigeria's Energy Transition Office, SEforALL has released reports highlighting the opportunities and challenges in Nigeria's e-mobility sector, providing actionable recommendations for stakeholders.

- **Rocky Mountain Institute (RMI):** RMI has partnered with Nigerian agencies to develop frameworks that guide the electrification of the transportation sector, emphasizing policies, finance mechanisms, and infrastructure development [18].

- **China CRRC Investment:** EMVC secured a $275 million deal with China's CRRC for EV assembly, manufacturing, and R&D, aiming to position Nigeria as a regional EV exporter [19].

POLICIES AND REGULATORY FRAMEWORK FOR EV ADOPTION IN NIGERIA

Nigeria is actively developing policies and regulatory frameworks to facilitate the adoption of electric vehicles (EVs), aiming to transition towards sustainable transportation and reduce carbon emissions. Key initiatives and plans include:

National Automotive Industry Development Plan (NAIDP): The Nigerian government has adopted the NAIDP to increase local vehicle production and promote electric vehicles. The plan targets 40% local content and 30% locally produced electric vehicles by 2033. It also aims to generate one million jobs and enforce the use of locally produced vehicles by government agencies and contractors [20].

Energy Transition Investment Plan (ETIP): Nigeria has developed the ETIP to guide its transition to cleaner energy sources, including transportation. The plan aligns with the country's commitment to reducing carbon emissions and promoting sustainable mobility.

Electric Vehicle Development Plan: In July 2023, the National Automotive Design and Development Council (NADDC) announced that this plan had entered its final implementation stage. It promotes the local assembly of electric public transport vehicles, paratransit vehicles, two-wheelers, and tricycles.

Presidential Directive on CNG Vehicles: In May 2024, President Tinubu mandated that all government ministries, departments, and agencies procure only Compressed Natural Gas (CNG)- powered vehicles. While this directive initially focused on CNG, it has opened the door for broader discussions on alternative fuel vehicles, including EVs.

Northeast Development Commission (NEDC) E-Mobility Initiative: In October 2024, President Tinubu approved the deployment of electric vehicles in Nigeria's Northeastern states. This regional initiative aims to improve mobility and reduce transportation fares across these states.

---

[17]https://cleantechnologyhub.com/wp-content/uploads/2022/08/Market-Intelligence-Report-State-of-E-Mobility-in-Nigeria-2022.pdf

[18]https://rmi.org/insight/nigeria-mobility-support/

[19]https://www.zawya.com/en/economy/africa/electric-motor-nigerian-firm-attracts-275mln-foreign-direct-investment-rkr7p1jx

[20]https://nairametrics.com/2023/05/15/nigeria-to-produce-30-locally-electric-vehicles-by-2033-nadip/

IMPACTS OF EV ADOPTION IN NIGERIA

Adopting electric vehicles (EVs) in Nigeria has a multifaceted impact encompassing environmental, economic, and infrastructural dimensions.

Environmental Impact

Transitioning to EVs significantly reduces greenhouse gas emissions, improving air quality, noise pollution, and public health. This shift aligns with Nigeria's commitment to achieving carbon neutrality by 2060, as outlined in the Energy Transition Plan (ETP), which aims to deploy 13 million electric vehicles—constituting 60% of the country's total vehicles—by 2050, with full deployment by 2060.

Economic Impact

The integration of EVs into Nigeria's transportation sector can stimulate economic growth through various avenues:

- **Job Creation:** Local manufacturing and assembly of EVs and related components can generate employment opportunities, foster a skilled workforce, and promote innovation within the automotive industry.
- **Energy Security:** Reducing dependence on imported fossil fuels can improve Nigeria's trade balance and enhance energy self-sufficiency. The adoption of EVs encourages investment in local renewable energy infrastructure, contributing to a more resilient energy landscape.

Infrastructural Impact

The widespread adoption of EVs necessitates substantial infrastructural developments:

Charging Infrastructure: A robust charging station network is essential to support EV users. This includes integrating renewable energy sources, such as solar power, to mitigate challenges associated with Nigeria's unreliable power supply [21].

Grid Reliability: The increased demand for electricity due to EV charging underscores the need to enhance grid capacity and stability, ensuring consistent and efficient energy distribution.

Challenges and Considerations

Despite the potential benefits, several challenges must be addressed to facilitate effective EV adoption in Nigeria:

High Upfront Costs: The initial cost of EVs remains prohibitive for many Nigerians. Importing EVs incurs significant expenses, compounded by import duties and fees. While local assembly efforts are emerging, the initial investment required for EVs remains a substantial hurdle for most consumers.

Public Awareness: Limited awareness and misconceptions about EVs hinder consumer acceptance. Comprehensive education and awareness campaigns are essential to inform the public about the benefits and practicality of EVs.

---

[21]https://theelectricityhub.com/accelerating-electric-vehicle-adoption-in-nigeria-challenges-and-opportunities/

Strategic Recommendations for EV Adoption In Nigeria

Short-Term Goals (1-3 Years)

a. Comprehensive EV Policy Framework
- Establish a national e-mobility policy covering EV adoption from manufacturing to disposal.
- Introduce financial incentives like tax credits and rebates for EVs.

b. Expand Charging Infrastructure
- Increase the number of charging stations in major cities and along highways.
- Foster public-private partnerships for fast-charging installations in strategic locations.

c. Public Awareness and Education
- Launch campaigns highlighting the benefits of EVs.
- Create EV experience centers for consumer engagement.

d. Support Local Manufacturing
- Provide incentives for local EV production.
- Promote technology transfer through partnerships, such as with Moroccan firms.

e. Specialised Training Programs
- Offer vocational training for EV technicians and engineers.
- Update university engineering curricula to include EV courses.

Medium-Term Goals (3-5 Years)

a. Strengthen the EV Supply Chain
- Build a local supply chain for EV components to reduce imports.
- Attract investment in battery manufacturing in Nigeria.

b. Integrate with Renewable Energy
- Increase solar-powered charging stations.
- Develop policies connecting EV charging to renewable energy sources.

c. Improve Grid Infrastructure
- Upgrade the electricity grid for higher EV demand.
- Employ innovative technologies to manage EV charging loads.

d. EV Adoption in Public Transport
- Electrify public transport fleets and incentivise ride-sharing and taxis to switch to EVs.

e. Battery Recycling Infrastructure
- Establish recycling facilities and regulations for EV batteries.
- Research second-life applications for used batteries.

Long-Term Goals (5+ Years)

a. Mass EV Adoption
- Target 30% EV adoption by 2025 and full electrification by 2060.
- Gradually phase out internal combustion vehicles.

b. EV Manufacturing Hub
- Develop a competitive EV manufacturing industry for domestic and export markets.
- Encourage innovation suited to African needs.

c. Circular EV Economy.
- Implement systems for reusing and recycling EV components.
- Establish extended responsibilities for EV manufacturers.

d. Regional E-Mobility Leadership
- Standardise EV regulations and charging systems across West Africa.
- Promote knowledge sharing and technology continent.

SOUTH AFRICA

INTRODUCTION

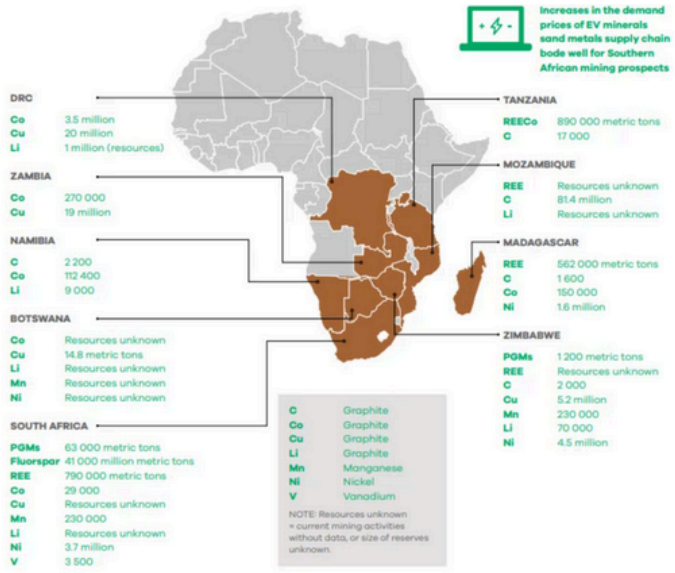
South Africa is one of the leading economies on the African continent, the country's automotive industry is one of the main pillars for its Industrial sector. Although the country has a well-established automotive industry, South Africa remains a large importer of electric vehicles this is due to the limited local manufacturing supply chain of electric vehicles. However, the country aspires to increase its EVs market. This is in alignment with the sustainable development goals and carbon reduction plan.

BACKGROUND OF SOUTH AFRICA'S EV LANDSCAPE

South Africa, like most SADC countries, has set a target to reduce its greenhouse gas emissions to 5% by 2050. Currently, the transport industry is the 3rd largest contributor to total greenhouse emissions, the industry accounts for 11%-13% [1]. As a result, it has become empirical for South Africa's department of transport to come up with a Green Transport Strategy which will support the efforts towards the 2050 goal. One of these strategies included in by the Department of Transport is the adoption of Electric Vehicles in the country[2].

South Africa is a mineral rich country especially when it comes to the minerals used in the supply chain of electric vehicles (see figure 1). However, most of these minerals are reserves and are yet to be unlocked. Despite the country's wealth in critical minerals, South Africa remains a large importer of EVs due to the limited amount of locally manufactured four-wheelers and the components that go into these vehicles.

Additionally, the country has a limited amount of infrastructure development to support the development of electrical vehicles. As a result of this, the price of EVs in the country are sold a premium of at least 20% above ICE (Internal Combustion Engine) model vehicles making them less affordable for middle class South Africans in urban areas and cities.



In 2022, South Africa reported only 4674 New Electric Vehicles (NEVs) sold, making up only 0.9% of total vehicle sales for that year[3]. New Energy Vehicles (NEVs) are made up of fully electric, plug-in hybrid and traditional hybrid vehicles. In 2023, total NEVs sales were recorded at 7746, a 66% increase from the previous year. The difference between 2023Q1 and 2024Q1 is 1877 NEVs sold, 113%. This growth is expected to continue in the next couple of years with the hope to attract the necessary investment to accelerate market growth and foster innovation in South Africa[4].

[1]National GHG Inventory Report, 2021

[2]EV White Paper, December 2023

[3]NAAMSA (National Association of Automobile Manufacturers of South Africa) Export Manua

[4]www.naamsa.net/south-africas-electric-car-sales-surge/

One of the biggest resistances towards electric vehicle adaptation is the high reliance on coal as a source of electricity generation. This contributes about 45% to total emissions, 0.9-1.0 kg CO_2e per kWh. This becomes a challenge when seeking infrastructure solutions for electric vehicles since charging stations depend on grid electricity for the most part. However, South Africa has started looking into renewable energy powered charging stations as a long-term solution especially where four-wheelers are concerned.

SOUTH AFRICA'S TRANSPORTATION SECTOR

The transport industry is in South Africa is divided by the demand in the urban and rural areas, public and private transportation and with a population of over 61 million people the automotive industry has become a significant contributor towards GDP. In 2024 NAAMSA reported that the automotive industry contributed 6-7% to South Africa's GDP for 2023. Millions of South Africans depend on the use of public transports such as trains, mini taxis, e-hailing and buses to commute daily and this makes it one of the key sectors in the country. Approximately, 15 million people rely on minibus taxis each day making it the biggest public transport systems in the country[5]. While, 23.6% of households use public transport and as of 2023 Bolt and Uber, the leading e-hailing services in the country, exceeded 3 million users in South Africa[6]. Additionally, the automotive industry has played a significant role in creating jobs both directly and indirectly.

According to 2022 data, 116683 individuals were directly employed by the sector and 239000 people were indirectly supported by the industry. In terms of international investments into the industry, there are 7 Original Equipment Manufacturers (OEM) with assembling plants in three main provinces; Gauteng, Eastern Cape and KwaZulu-Natal. The 7 OEM include, BMW, Isuzu, Toyota, Mercedes-Benz, Nissan, VW and Ford.

Even though the automotive industry has had a positive impact on the South African economy through job creation and attracting foreign investments, there are some concerns about the environmental damaged caused by the industry. The concerns are not only because of the transport sectors direct contribution to Co2 emissions but also from the manufacturing of the vehicles. Due to the fast-growing contribution towards greenhouse gas emissions the department of transport has come up with a Green Transport Strategy (GTS, 2018-2050) which include several interventions to help reduce the emissions. One of the key investment areas for the department is the investments towards the transition of public transport manufacturing and investments towards charging stations. Although the introduction and transition towards EVs has been slower than anticipated, the department of transport has committed to work on strategies and policies which will accelerate the adoption of electric vehicles.

[5]www.africacheck.org

[6]www.iol.co.za/technology/big-tech/the-ups-and-downs-of-south-africas-e-hailing-sector

E-MOBILITY CLIMATE

The South African automotive industry has a heavy reliance on the European Union for exports of certain auto assembly parts, this possess a challenge because the EU is fast moving when it comes to the adoption of electric vehicles, with the plan of banning any new petrol and diesel-fuelled vehicles by 2035. This has increased the pressure on the automotive industry in South Africa to accelerate efforts toward the transition.

The internal combustion engine (ICE) vehicles are still dominating the market, while battery electric vehicles (BEVs) and hybrid electric vehicles (HEVs) remain marginal. In 2024, electric vehicle sales comprised less than 2% of total vehicle sales. The plugless hybrid vehicles are more popular than the BEV and this is due to the increase in availability and affordability from cars such as the Toyota Corolla Cross Hybrid[7]. The reliability of hybrid cars are a preferred option for private passenger vehicles due to unreliability in the energy supply.

The second-largest sub-set in the market is light commercial vehicles which are used last-mile delivery services such as Takealot, DHL and Skynet. There us projected growth in this market due to companies taking responsibility for their level of carbon emission into the environment. The expected growth for last-mile delivery serves is projected to be around 90 000 by 2030 this will be made up of electric bicycle, electric motorcycle and electric three-wheelers.

The most important sub-set is the public transport sector, the adaptation in this sector is expected to take a longer period of time due to the complexity of the sector. The taxi industry in South Africa is controlled by the taxi association which often possess a challenge when it come to policies and regulations. Over 5 years ago when ehailing was introduced to the South African market, the taxi industry went on multiple strikes to prevent ehailing drivers from getting on the same route as taxis. This complexity makes it challenging for companies to introduce and test electric minibus taxis. However, Golden Arrow in City of Cape Town has tested and deployed electric buses for daily commuter use. The plan is to procure approximately 60 electric buses a year to transition from diesel to electric. For the minibus taxis, Flx EV is the first stakeholder to pilot electric minibus taxis in South Africa and is looking at the feasibility of deployment. In order for the public transport transition to be successful government intervention is required this can be in the for if regulatory frameworks, policies and subsidies which will assist accelerate the transition process. It is also important that government raises awareness about the importance of the transition and show support to the taxi association community as well as public transport users.

[7]www.bolt.earth.com

INFRASTRUCTURE DEVELOPMENT

One of the biggest challenges with the transition to electric vehicles is infrastructure development. As of 2025, there are over 350 publicly accessible charging stations in the country, this includes ones located inside dealerships. In 2022, Audi South Africa, BMW, Jaguar and Nissan made significant investments in the expansion of the charging stations. Audi South Africa in partnership with Grid Cars established 70 new charging stations, followed by 60 charging stations by BMW. Although the expansion of the charging stations has been a positive outlook for the transition to EVs it is without its own challenges.

Most of the EV charging stations which have been deployed are dependent on the grid, where the predominate energy producing source is coal. This is a challenge for two reasons; an electric vehicle charge from the grid produces 5.8 tonnes of CO2 emissions on an annual basis relatively higher than a petrol car which produces 4.4 tonnes of CO2 emissions. Secondly, Eskom, the main power producer in the country has faced an overload on the existing grid and has had to implement power cuts to control the supply/demand of electricity in the country[8]. The power cuts have caused concerns for inflow of charging investments into the country. These two issues have given the renewable energy sector an opportunity to pilot and test out renewable energy charging solutions for the future.

At the end of 2024, the first off grid charging station was piloted in the North-West by a company called CHARGE. The next phase of the project will be rolled out into other part of the country. Although this is a milestone in the green transport sector, there has been challenges of uncertainty around policies, approvals of projects, lack of national frameworks for renewable energy charging stations especially along the national roads. This has further delayed the progress of deployment and development in the market. To ensure the success of infrastructure development by the private sector and the inflow of foreign nvestments, the government needs to work on regulatory frameworks and policies around charging station deployment.

Another area of opportunity is in raising awareness of the location of these power stations, this can be done through an app that is connected to all charging stations despite it being inside a dealership or public. This will help the public and drivers of EVs to easily access these stations.

BARRIERS TO EV ADOPTION IN SOUTH AFRICA

Although the adoption on EVs is exciting and provides a lot of new opportunities to develop the local economy, there are market barriers which continue to slow down the progress in the sector. According to an electric vehicle MIR report by GreenCape these barriers include lack of policy, high import duties, product misfit into the South African market and lack of skills[9]. Added to these barriers' awareness, lack of competition and energy supply challenges which were mentioned in the previous section. These barriers into the market provide government to intervene and offer support to local and international stakeholders in the acceleration of EVs.

Policy and Regulatory Framework

In South Africa, there are policy frameworks which are used for ICE vehicle manufacting however these frameworks are not easily adaptable for EV manufacting. The lack of regulatory framework challenges investors' confidence into the market because there is nothing protecting them for external risks which are not related directly to the manufacturing of the vehicles.

Additionally, there is a lot of red tape and approvals standing in the way for infrastructure development and the building/expansion of manufacturing plants. This is a challenge for existing manufactures who are seeking to expand their supply value chain. The lack of policy framework also

[8]www.autoforum.co.za/View-News-Article.aspx?News=sona-president-must-announce-plan-to-accelerate-ev-transition-25-37-05

[9] GreenCape, 2021. Electric Vehicle Market Intelligence Report 2021. [Online] Available at: https://www.greencape.co.za

challenges the level of competition in the market, at the moment the market is volatile, and this possess a risk of loss which can be absorbed by big manufacturing companies. However, for smaller and medium sized businesses this risk is big and may result in serious financial implications.

Import duties

The current import duty on Electric Vehicles (EVs) is 25% while import duties on internal combustion engine (ICE) vehicles is 18% [10]. Electric vehicles are also categorized as luxury goods and are likely to incur additional tax as a result. This is a significant obstacle to the EV adoption in South Africa as it makes it more expensive for consumers to afford the transition making it less attractive to individuals and companies.

BMW and other suppliers of EVs have applied to the International Trade Administration Commission (ITAC) for the reduction of import taxes but the applications have been rejected by the ITAC. The reason for rejection was due to local support of EV manufacturing.

On the other hand, the Depart of Trade, Industry and Competition has entered negotiations with the Euopean Union to reduce import tariffs from 25%. As an exchange South Africa will increase import tariffs on vihcles with an engine size smaller than 1000 cc. This deal will assist in accelerating the adoption process of EVs in the EU and South Africa.

Product misfit

As mentioned in the previous sections, the transport systems and its users in South Africa is complex and part of it is due to the complex past of the country which resulted in geographic segregation. A lot of people who benefit from having jobs in the cities live outside of the city and commute to their workplaces daily. Some people use public transport to community while others use private vehicles.

Either way it is important that these individuals are able to afford their chosen mode of transport otherwise we stand a chance of losing them in the workforce which will further increase the inequality gap in the country. So affordability and accessibility have a big role to play in the public's eye and at the moment ICE models tick both boxes. An EV model can go from anything starting at R450 000 which is higher than an ICE model. This price point does not cater to a middle-income household or an individual who is in the middle class.

Accessibility would have to be driven by OEMs, dealerships and commercial banks, OEMs and dealerships can work together to create vehicle ownership models while commercial banks and insurance companies will work on finance terms specifically for EVs. It is equally as important for overseas manufactures to understand the lifestyle and economies of scale in the country so to produce products that customers will be attracted to. This will increase the demand for the vehicles and reduce the production costs currently attached to EV manufacturing. However, for this to happen, government needs to intervene and encourage the awareness around EVs which will then increase local demand.

[10]Forbes Africa. (2024) 'Interpreting South Africa's EV import duties', Forbes Africa, 26 January. Available at: https://www.forbesafrica.com/current-affairs/2024/01/26/interpreting-south-africas-ev-import-duties/

Lack of skills to support adoption

One of South Africa's biggest challenge is the youth unemployment rate which is amongst the highest in the world. The EVs sector presents an opportunity for the public and private sector to partner-up and upskill young people for the future growth of the sector. Even existing technicians who work on ICE cars would need to be properly trained on EVs. The upskilling of people for functions across the entire supply chain will allow for the local manufacturing of EVs to grow quicker and also assist in curbing the fight against youth unemployment in South Africa.

It is also a great opportunity to introduce ecosystems which support start-ups, SMMEs (Small to Medium Enterprises), this will create competition in the market and decrease certain costs along the supply chain and have a domino effect for the final product costs. Stakeholders Africa's EV Sector in South The success of the energy transition requires collaborate efforts from all stakeholders, from government to NGOs, private sector investors to manufactures and the community. Stakeholder engagements will help navigate through the challenges and provide an opportunity for growth, long-term sustainable solutions and economic growth. When analysing the EVs sector there are five categories in which stakeholders can be divided; government bodies who deal with regulation and policies, private sector players, financial institutions, NGOs (NPOs) the rest of society, each stakeholder has an important role to play in the success of this transition. It is therefore crucial that all stakeholders align and work together.

In this study we analyses and map out the stakeholders for EV adoption in South Africa, by doing this we are able to identify key players, understand their interest, influence and potential conflicts which may hinder the decision making process. The effectiveness of stakeholder engagement will allow an accelerated effort to the adoption of EVs into the market. Government bodies The role of government in any sector is to oversee that the rules and regulations are being upheld by all other stakeholders. The government and its agencies asl keep policies and frameworks in place to ensure fair practises and conditions which will not disincentivize any group. In the case of South Africa, the government also facilitates any infrastructure development related to EVs this includes charging station deployments and the approval of projects. The government and regulatory bodies will therefore have a high influence in the direction of EVs and high interest in the sector. Some of the key government agencies which are important for South Africa include:

1. Department of Mineral Resources and Energy (DMRE), which is responsible for the oversight of energy policies and regulations. The department is also responsible for promoting renewable energy integration and offer support towards EV charging infrastructure in the form of approvals and collaborations with private sector investors.

2. Department of trade, industry and competition (DTIC), as mentioned in the previous section the DTIC is a trade partner for imports into the country and are responsible for negotiations with investors in the manufacturing of automotives. The department also ensures that fair and equitable practises are maintained especially for a sector like the EV sector where competition is not high yet and local manufacturing is growing. The department is also in charge of industrial policies.

3. Department of Transport (DoT), this department keeps track of the vehicle emissions, road infrastructure, ensuring road safety, implementing policies and frameworks which will ensure a fair transition in the transport sector. The department of transport is also a mediator between public transport agencies and private investors who may want to pilot EVs.

4. **National Treasury** is responsible for budget allocation and government budgets for EV incentives, subsidies and infrastructure development. The National Treasury is also responsible on advising the president on taxes and import duties and their impact on overall budget. This department has the responsibility of forecasting the financial implications of transitioning from ICE to EVs.

5. South African Bureau of Standards (SABS) and Municipal Energy Department are the two bodies which work together to ensure compliance, safety and approvals of the EVs as well as charging stations. These two bodies are also responsible for protecting citizens of the areas which are affected by the transition.

Another key player in the sector linked to the government is Eskom, the main power producer in the country. For years Eskom operated as a monopoly however over the years the approval off IPPs (Independent Power Producers) has allowed for increase in energy supply. Eskom remains the key player in controlling and distributing power, therefore the power producer is key especially for charging stations. It is also important in the strategic management and planning of the energy mix between renewable and non-renewable energy infrastructure.

Private sector players

The private sector players can be broken down into sub-categories which include automotive manufacturers, charging stations developers, start-ups, SMMEs and research and development institutions. These players often have high interest as this is their chosen path of expert and high influence.

1. Automotive industry and manufacturers, there are 7 well established automotive manufactures with assembling plants in South Africa (see figure 2); Toyota, Volkswagen, BMW, Mercedes-Benz, Ford, Nissan and Isuzu. Their role and investment in the manufacturing of automotive is key in the local production and growth of EVs. The current market leader in South Africa is Toyota South Africa with its HEV model (Corolla Cross Hybrid). The traditional ICE auto manufactures are under pressure to transition towards the manufacturing EVs but are resistant due to the high initial costs associated with the production of EVs compared to ICE vehicles. However, an increase in investment, subsidies and incentives may help shift the progress forwards. Among the manufactures are also hybrid vehicle manufacturers, who bridge the gap between ICE and BEVs, and this may be a better suited model for the typical South African consumer. These cars are a safe option for those worried about power cuts and volatility in the production of electricity in the country. It is more likely that the HEV manufactures will experience high market growth compared to BEV manufactures.

Charging stations developers, the main stakeholder of charging stations development are start-ups and the well-established automotive companies. The start-ups are focused on the piloting and development of infrastructure solutions companies such as Rubicon, GridCars and CHARGE. These companies face higher risk compared well-established to already automotive companies; this is due to the size of the company. Therefore, it is important that government supports the start-ups by building an ecosystem which allows them to grow and innovate.

Research and Development institutions; these institutions assist government with data drive research and give the public insights on any industry developments. They play a crucial role in providing reliable information especially with all the social media influence and spread of misinformation. These are the reliable organizations; Council for Scientific and Industrial Research (CSIR), South African National Energy Development Institute (SANEDI). University Research Centers and GreenCape. These organizations are important for innovations, information sharing and skills development however they often lack funding to assist in their research.

- **Financial Institutions**

  The role of financial institutions is critical in securing funding, the distribution of funds and the implementation of financial solutions which are tailored for the EVs so that they can be affordable to produce and to buy. This includes banks both international and domestic. The Development Bank of Southern Africa (DBSA), Industrial Development Corporation (IDC), International Finance Corporation (IFC) and the African Development Bank (AfDB) provide funding towards EV infrastructure and manufacturing projects not just for South Africa but for other African countries to. These financial institutions are also responsible for attracting foreign investments outside the continent.

  The commercial banks (Standard Bank, Nedbank, FNB and Absa) are responsible for offering consumer loans and tailored financing options for EV purchases. The commercial banks are supported by the South African Reserve Bank.

- **NGOs and NPOs**

  NGOs and NPOs are good at bridging the gap between civil society and other stakeholders mentioned Due to interest of NGOs and NPOs it becomes easier for them to be on ground finding out about what is going on and what information is needed. These stakeholders can connect the urban areas and rural communities in the participation of the energy transition. Additionally, they are able to gain public opinions and share this information with government agencies, although their influence is considered medium to low they play a key role in information sharing and conducting on the ground research. NPOs such as GreenCape are also able to offer consulting fees to institutions due to their level of expertise.

Other stakeholders which are considered low influence and medium to low interest are skilled workers (engineers and technicians), youth (graduates seeking opportunities in the workforce), daily commuters and ehailing operators. Other key stakeholders to consider are battery manufactures and renewable energy equipment providers. All stakeholders have been analysed and mapped out in the stakeholder map in the appendix.

POLICIES AND REGULATORY FRAMEWORKS IN SOUTH AFRICA'S EV SECTOR

The lack of policies and regulatory frameworks is one of the hinderances to the progress of EVs in the country. The automotive industry does have Automotive Production Development Programme and Automotive Investment Scheme which assist with the development of the manufacturing of automotives. However, these policies cannot be implemented in the manufacturing of EVs nor can they be applied in the development of charging stations.

The Department of Transport has developed a policy to minimize the negative environmental impact of the transport sector while addressing current and future demand for transport. This is the Green Transport Strategy (2018-2050) which is aimed at contributing towards the efficiency of the transport sector transition, economic development and drive the goals of the National Transport Master Plan 2050. The GTS encourages the adoption of EVs but lacks strong strategic policy around financial incentives for consumers. The DTIC has also developed an EV roadmap to encourage investment from international investors into the local EV and battery production.

Tax incentives and subsidies

The current import duties on EVs are 25% which is relatively higher than the 18% of ICE vehicles, making them less attractive. This is something the government has been challenged to look at as it disincentivizes manufactures and consumers from transitioning to EVs.

Additionally, EVs are currently considered a luxury good subjecting them to an additional ad valorem tax, this further increases the cost of EVs for consumers. To incentivize the consumption of EVs the government should consider lowering import taxes and offer subsidies for local EV manufactures, this will encourage competition in the sector and reduce consumer costs.

Regional initiatives

The city of Johannesburg, Tshwane and Cape Town have come up with strategies to expand and encourage the adoption of EVs through the deployment of charging stations. The cities have also incentivized the piloting of projects such as buses and public transport electrification. Although the approach is positive for the city it is important that national government encourages strategic development in the other cities as well. This will help avoid hyper urbanisation in these cities in the future which will result to over population due to advance development.

FINANCIAL, ECONOMIC AND ENVIRONMENTAL IMPACT IN SOUTH AFRICA'S EV SECTOR

- ### Financial Impact

South Africa's government, foreign investors and other private sector investors are injecting financial resources towards the EV industry. One of the investments towards EV manufacturing is the introduction of a tax deduction by the government of 150% for manufactures investing in electric and hydrogen vehicle production. The goal for the tax reduction is to attract $27 billion in new investments [11].

[11] https://energycapitalpower.com/south-africas-gree n-mobility-revolution-a-hotspot-for-ev-investment-g lobal-partnerships/.

This will attract investments from foreigners outside of the continent which will spread throughout other African countries.

In the recent address by President Cyril Ramaphosa at the 2025 Annual Meeting (Davos), he mentioned the importance of developed countries' investment in assisting developing countries in their just energy transition and this includes the development of environmentally friendly transport systems. The president also highlighted the importance of strategic partnerships on the continent through the African Continental Free Trade Area in building supply chains which support development on the continent. This would also mean a reduction in import and taxes for continental trade.

Economic Impact

The building of supply chains across the continent would benefit young people in Africa as this would provide them the opportunity to upskill and find jobs in the market. Supporting local EV manufacturing would have a great impact on the high unemployment rate in South Africa from battery manufacturing, vehicles, development assembling on of charging infrastructure, sales and maintenance of EVs. This supply chain would have a positive impact on the economy. Additionally, the government should put policies and incentivise in place for private sector investors to train young people on the necessary skills required for the future of EVs. Another key economic impact is the exports of automotives, South Africa is a key trade partner for the EU which has fast tracked their transition towards EVs. The EU region has started phasing out ICE vehicles and aims to complete the phasing out of new ICE vehicles by 2035, this puts pressure on South Africa's automotive export market.

Environmental Impact The positive impact of transitioning is better air quality, less carbon emission (should renewable energy be used for charging stations), reduction in noise pollution and overall better healthy quality for citizens.

However, there are some key areas which need to be considered for the success of the transition. Currently 80% of the electricity generated in the country is through the use of coal therefore an accelerated switch to EVs could lead to an increase in electricity demand, which will lead to more coal being used and more emissions, this is the reason why it is important to develop renewable energy charging solutions. [12]

Secondly, the government needs to develop a plan to recycle batteries as the disposal of these batteries may cause further damage to the environment if it's not carefully controlled. The lifespan of EV batteries is around 8-10 years [13]. Additionally, the mining of the materials required of EV batteries; lithium, cobalt, nickel and manganese, needs to be carefully regulated. In the past we have seen mining companies leave mining sites after the minerals have runout without proper control and this has caused damage to the surrounding communities.

There are other environmental impact such as manufacturing and waste removal from the plants which need to be considered especially when drawing up policies suited for EVs.

---

[12] Eskom Integrated Report (2023)

[13] Natural Sustainability (2020), Environmental Risk of Improper battery disposal

STRATEGIC RECOMMENDATIONS FOR SOUTH AFRICA'S EV SECTOR

As one of the leading economies on the African continent South Africa has the potential to accelerate and lead the transition to EVs. The address at Davos 2025 set the stage for the G20 Presidency and this is a great opportunity for the country to represent the continent to the rest of the world showing off the potential that exists and the development that is yet to comes. However there needs to be a strategic framework with timelines attached to it for investors to feed confident enough to inject money into the country. Here are some short-, medium- and long-term recommendations.

- **Short-term**

  The government needs to proritise policy and regulatory frameworks, this includes the reduction of taxes, the subsidies towards EV charging stations rollouts especially the charging stations which are off-grid (using renewable energy). The government could also investigate implementing EVs into their government fleets this will raise awareness of EVs in the country. Another area of priority should be public awareness and education, there are not enough campaigns aimed at educating citizens on climate change and the solutions available. The lack of education reduces the demand for EVs. Additionally, it does not give young people from disadvantaged or underserved communities the opportunities to think creatively about solving some of the issues facing society because of climate change. Lastly, the government needs to facilitate the partnership between global automakers and local manufactures to expand the existing automotive industry for the transition of EVs.

- **Medium-term**

  Expanding of charging infrastructure across different cities in the country. This could mean looking into using existing retail/petrol stations to add EV charging stations, this would increase accessibility and reliability of the stations in urban and rural areas.

  The mining sector should work on a value supply chain model which allows for the extraction and processing of critical minerals used in the production of EV batteries. These supply chains will benefit local economy and create jobs for the community members in mining areas which are often underserved.

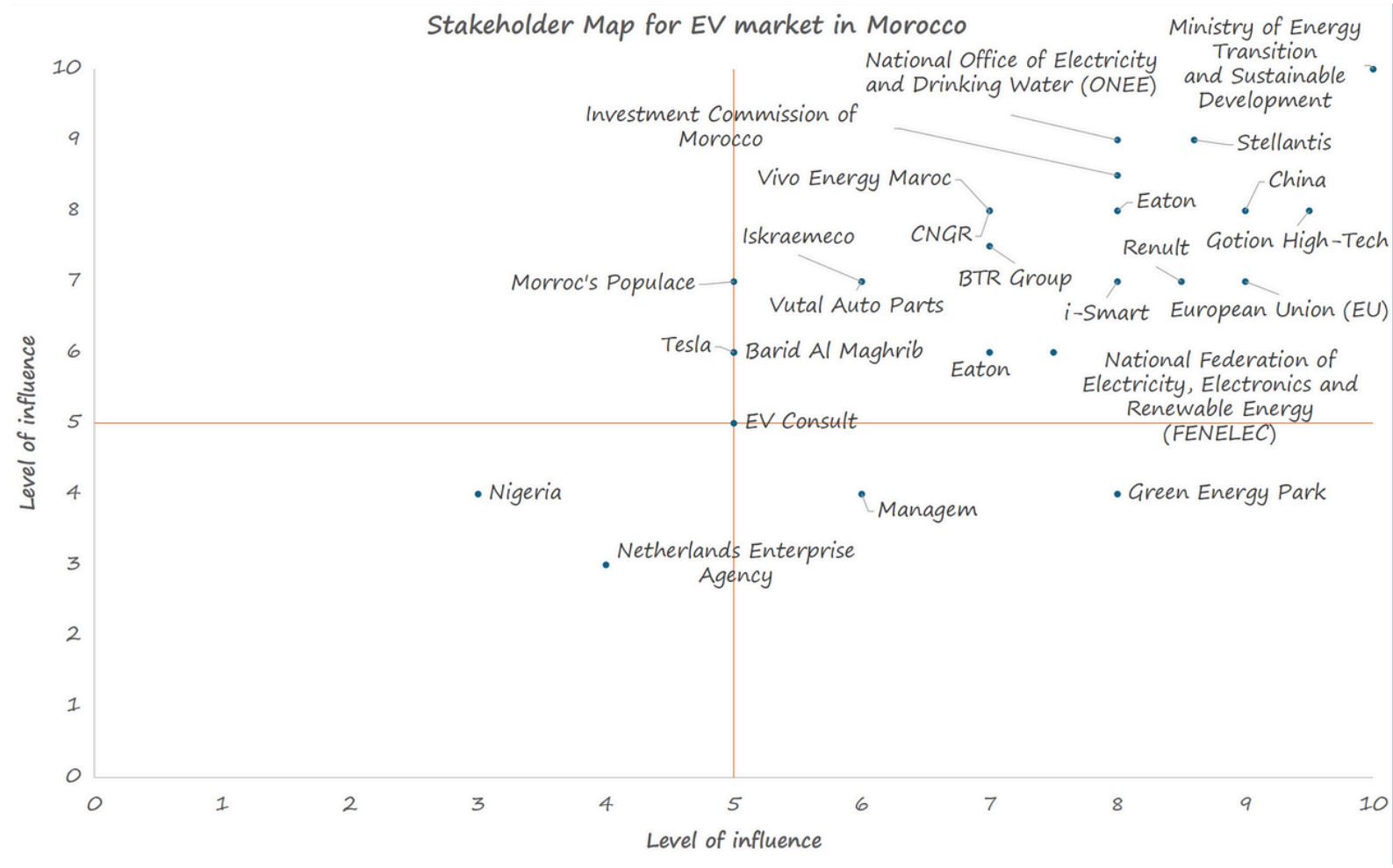
  Commercial banks and other financial institutions should prioritize the development of financial models which will incentivize consumers to move away from ICE vehicles towards EVs this will have to be regulated and approved by the government and the minister of transport.

- **Long-term**

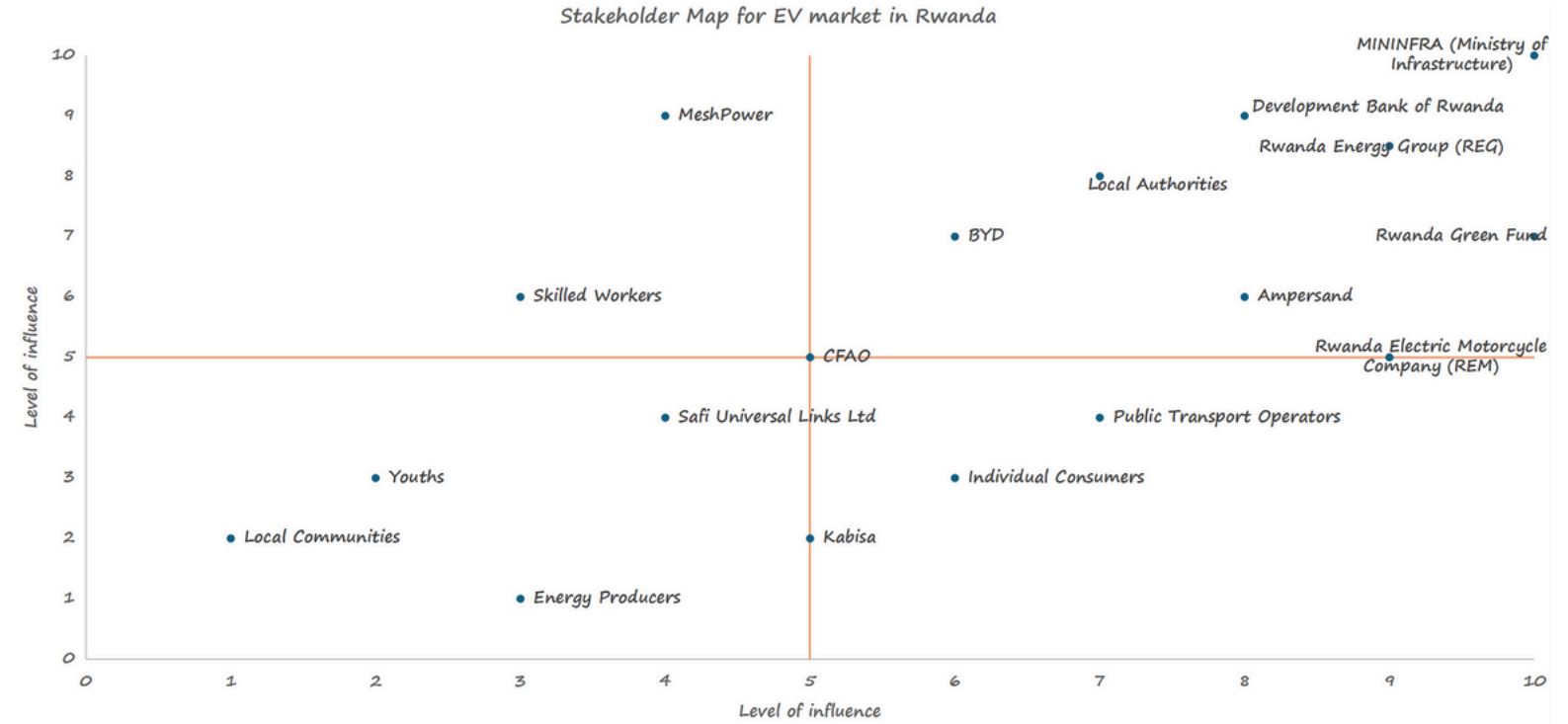
  To achieve long-term sustainable development, the government needs to ensure that the systems implanted will be self-sustaining. So building an EV ecosystem which can help maintain low carbon emissions, recycle watse in an efficient manner, manufacturer and maintain the EVs in an efficient manner. Build energy storage solutions especially because South Africa has a history of energy supply problems. Being able to store energy produced from renewables will benefit the country far beyond EVs. Raise awareness towards 2-wheelers and 3-wheelers especially for people who live within close proximity to their workplaces and do not have to use 4-wheelers to commute. This not only reduces traffic but also encourages a healthy nation in the long-run.

STAKEHOLDER MAPPING

MOROCCO

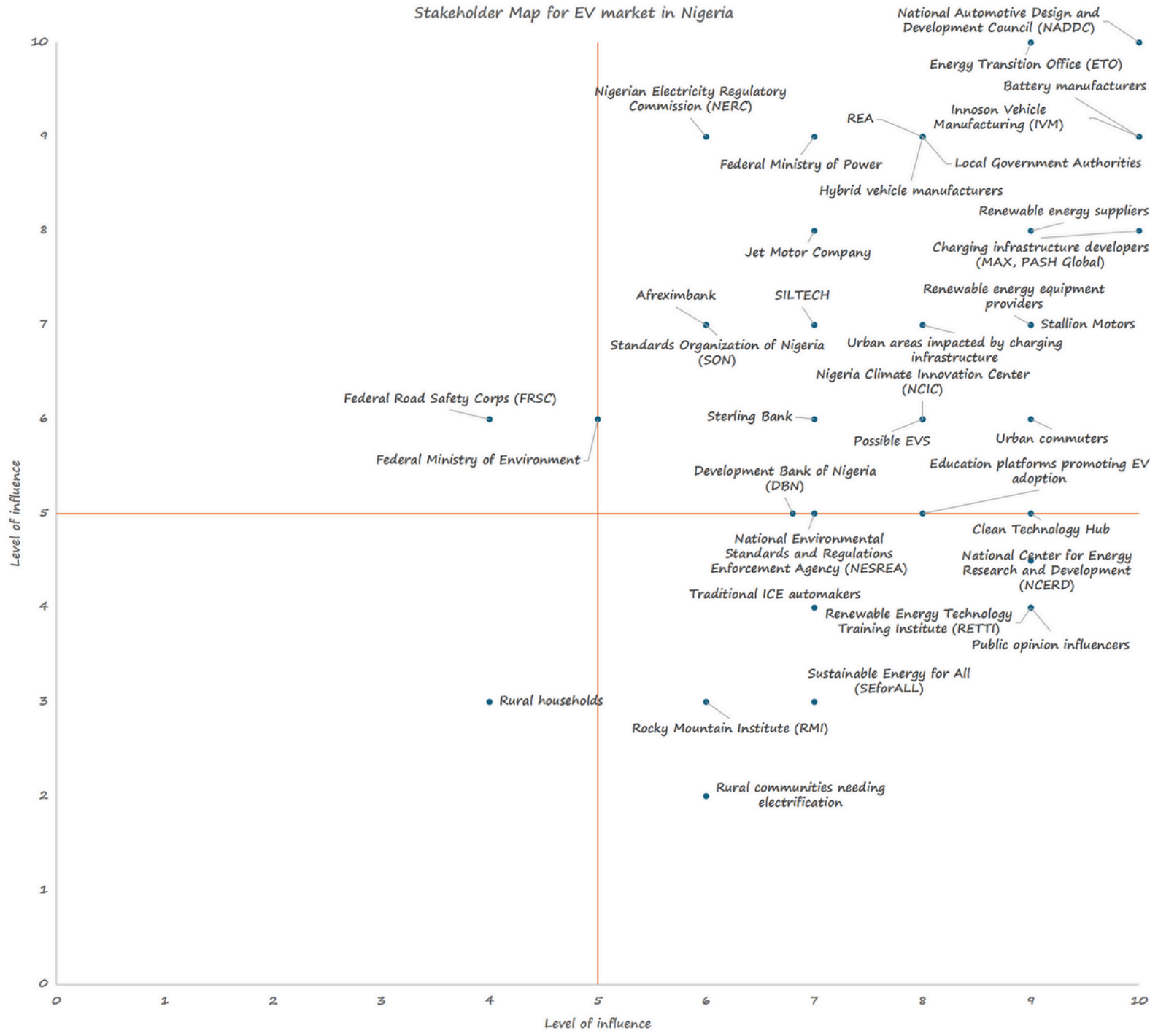


RWANDA



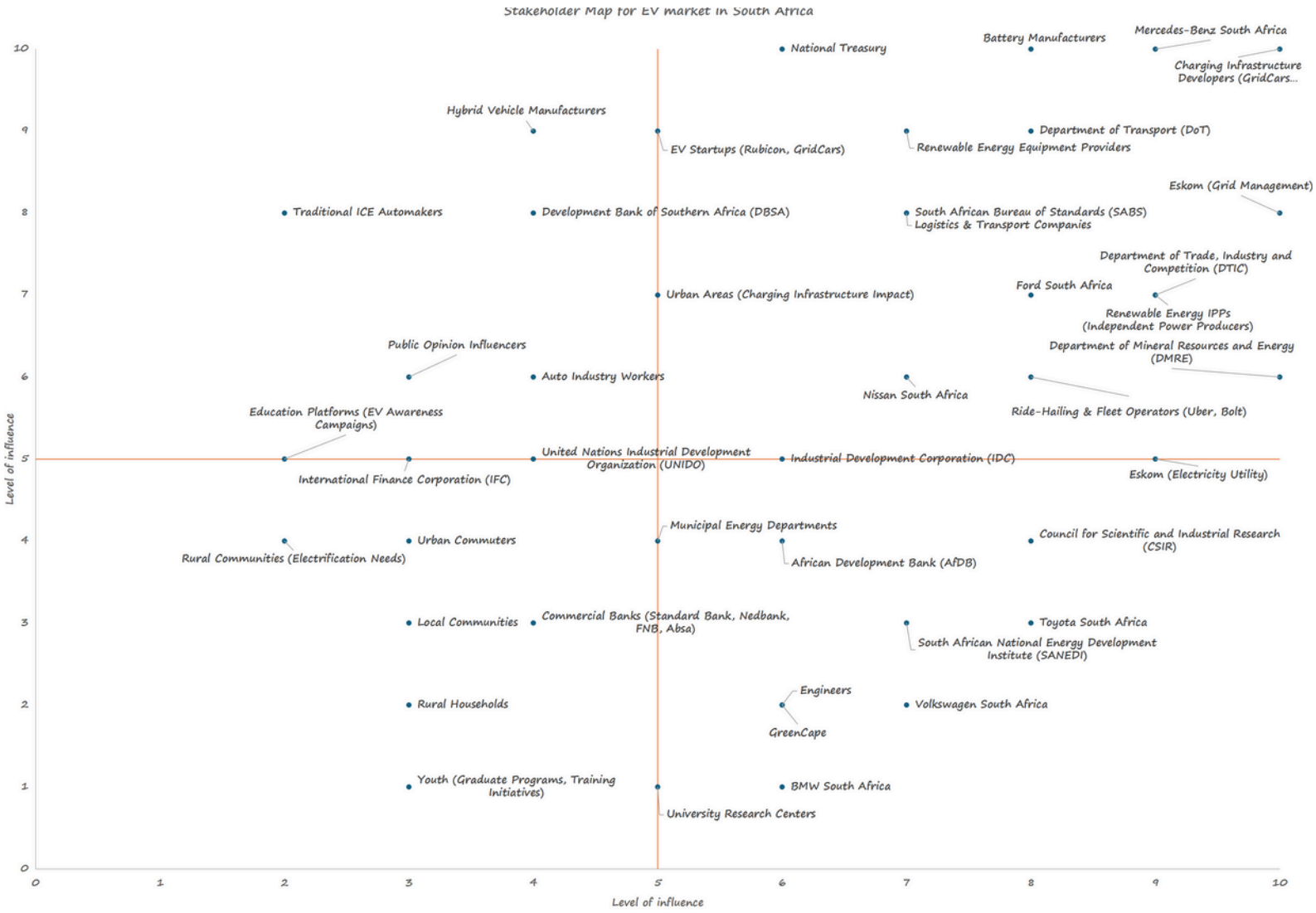
STAKEHOLDER MAPPING

NIGERIA



STAKEHOLDER MAPPING

SOUTH AFRICA



TANZANIA

INTRODUCTION

Tanzania has the highest number of Electric Vehicles in East Africa. As of early 2023, Tanzania had approximately 5,000 electric vehicles on the road comprising of two and three-wheelers, which dominate urban transport. A report estimated that there are only 30+ 4 wheelers in the country.

The government of Tanzania is making moves to transition from conventiional fossil fuel powered vehicles to EVs. Most notably is inauguration of Eastern Africa's first electric train, running 300 kilometers from Dar es Salaam to Morogoro. This modern, standard-gauge railway (SGR), built by Türkiye-based Yapi Merkezi, is the first of a five-segment project spanning over 1,000 kilometers and aimed at transforming the region's transportation infrastructure. The electric train, a nearly $2 billion investment, boosts domestic connectivity and economic ties with neighboring landlocked countries like Uganda and Rwanda. Eventually, the SGR will extend from Dar es Salaam to Mwanza and Kigoma, covering nearly 1,300 kilometers [39]

BARRIERS TO EV ADOPTION IN MOROCCO

The biggest barrier to EV adoption in Tanzania is cost, and lack of enabling policies to help subsidize the cost of these vehicles. The notable barriers include:

1. Lack of supportive policies: Currently, Tanzania lacks an official policy on electric vehicles. Hence, LATRA, in partnership with the Dar es Salaam Institute of Technology (DIT) and other collaborators, is working to address this gap and establish a regulatory framework for EVs in the country[40]

2. High import taxes: High import duties (up to 100% for four-wheel vehicles) make EVs financially inaccessible for many.

3. A dearth of financing options for EV startups: 10 companies in the sector involved in importing, selling, servicing, and charging EVs in Tanzania. These 10 companies are estimated to have raised only about $1m, compared to the much bigger investments in other African countries like Kenya and Morocco.

4. A weak supporting ecosystem. [41]

STAKEHOLDERS IN TANZANIA'S EV SECTOR

Several key stakeholders are involved in Tanzania's EV landscape. Some of which include:

1. The Tanzania Revenue Authority (TRA) and Land Transport Regulatory Authority (LATRA) manage vehicle registration, tax, and licensing, essential for regulating electric vehicle (EV) adoption.

2. TANESCO (Tanzania Electricity Supply Company), regulated by EWURA (Energy and Water Utilities Regulatory Authority), oversees electricity generation and distribution, which is crucial for EV charging infrastructure.

3. International collaborations, such as with UN-Habitat and Urban Electric Mobility Initiative (UEMI), have supported initial e-mobility ventures and provide frameworks for developing EV projects, especially through SOLUTIONSPlus and other programs.

4. TBS (Tanzania Bureau of Standards): TBS develops standards for products and services in Tanzania. They establish quality standards for electric vehicles and charging equipment to ensure safety and reliability.

5. DIT (Dar es Salaam Institute of Technology): DIT is an educational institution focused on technology and engineering. They provide research and training related to electric vehicle technology development. and infrastructure

6. China: Chinese EV manufacturers are expanding their presence in Tanzania, both through imports and local production. Companies like TRÍ, an e-mobility startup, import parts for three-wheelers from China and assemble them locally.

7. TRí, a leading Tanzanian electric mobility startup, is transforming the EV landscape by making electric three-wheelers accessible through lease-to-own models. As Tanzania's largest provider of electric three-wheelers, TRí is expanding its impact by partnering with BOLT to recruit drivers and deploying vehicles in Dar es Salaam. With plans to establish a local assembly line in 2024, TRí is shifting from importing fully assembled units to fostering local production42.

---

[39]https://www.aa.com.tr/en/africa/tanzania-launches-e astern-africas-1st-electric-train/3251127

[40] https://thechanzo.com/2023/11/30/latra-explains-ho w-tanzanias-transport-sector-will-be-electrified/

[41]https://africaema.org/resources

GHANA

INTRODUCTION

Ghana's electric vehicle sector is currently in its early stages, characterized by significant potential for growth and development. The government has recognized the need for a transition to electric mobility as part of its strategy to reduce greenhouse gas emissions and promote sustainable transportation. This overview will explore the current state of the EV market, key challenges, government initiatives, and future prospects.

CURRENT STATE OF THE EV MARKET

The electric vehicle market in Ghana is described as nascent, with various initiatives underway to foster its growth. Six notable e-mobility companies are currently operating in the country, having deployed over 250 electric two-wheelers and around 1,000 electric four-wheelers[1]. The government has set ambitious national e-mobility targets and actively promotes the transition through fiscal incentives and supportive policies. Currently, plans are underway to install 200 EV charging stations, reflecting a commitment to expanding the infrastructure necessary for EV adoption[1].

CHALLENGES TO EV ADOPTION

Ghana faces several challenges that currently hinders the widespread adoption of electric vehicles:

- **Electricity Supply Issues:** The country experiences erratic electricity supply and high costs, which complicate the feasibility of operating EVs efficiently[2]
- **Financial Viability of Charging Stations:** Operating charging stations is not yet profitable due to high electricity tariffs and insufficient demand. Reports[3] indicate that charging stations require extensive operational hours to break even.
- **Public Awareness and Education:** There is a need for public education on the benefits and operation of EVs to increase consumer acceptance and demand[3].

GOVERNMENT INITIATIVES AND POLICIES

The Ghanaian government has initiated several policies aimed at promoting electric vehicles:

- **National Electric Vehicle Policy:** Launched at COP28 in December 2024, this policy aims to decarbonize the transport sector and includes plans for stakeholder consultations to address barriers to EV uptake[4].
- **National Electric Mobility Roadmap:** This comprehensive framework outlines targets for deploying electric vehicles, including specific goals for e-buses and e-cars by 2050. It also identifies barriers to adoption and proposes measures to overcome them.[5]

---

[1]https://www.esi-africa.com/news/ghana-sovereign-fund-to-back-ev-and-battery-production/

[2]https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4774488

[3]https://www.undp.org/ghana/press-releases/ghana-accelerates-electric-vehicle-adoption-new-market-opportunities

[4]https://www.esi-africa.com/business-and-markets/ghana-uk-partnership-look-to-unlock-west-african-nations-ev-potential/

[5]https://unepccc.org/wp-content/uploads/2022/08/national-electric-mobility-roadmap-upload-25072022.pdf

ANGOLA

INTRODUCTION

Angola's electric vehicle is in its early stages but showing promising growth. The country is taking steps to embrace sustainable transportation and reduce its dependence on fossil fuels. As of 2024, Angola has approximately 4,000 electric on its roads, representing a 100% increase from the previous year. This growth is significant, though EVs still constitute less than 1% of the total vehicle fleet in the country.

BACKGROUND OF ANGOLA'S EV LANDSCAPE

Historically, Angola's economy has heavily relied on oil exports, which have shaped its development but hindered diversification into renewable energy and sustainable mobility sectors. However, declining oil production and global shifts toward low-carbon energy have prompted Angola to explore alternatives like EVs.[1]

Angola generates over 74% of its electricity from hydropower, positioning it as a leader in clean energy in Africa. This renewable energy base provides a strong foundation for powering EVs sustainably.[2]

EV Market Overview

- **Fleet Size:** As of 2024, Angola had approximately 4,000 EVs on its roads, doubling from 2,000 in 2023. Despite this growth, EVs account for less than 1% of the total vehicle fleet[3]
- **Adoption Trends:** The market is growing rapidly due to imports from China and the United States. Projections under the National Electromobility Strategy aim for 1.5 million EVs by 2035.[4]

Infrastructure: CVE Angola launched Luanda's first public EV charging station in 2024. However, the country has only five operational charging stations in urban areas like Luanda.

Angola's transport sector exhibits high greenhouse gas (GHG) emissions intensity. In recent assessments, the industry emitted 7.5 million tons of CO2 equivalent annually, higher than the global and African medians. Adjusted for economic output, the emissions intensity was 3.3 kilograms of CO2 per dollar of value-added—more than double the international median of 1.5 kilograms per dollar.[5]

Road transport dominates Angola's transportation system, accounting for most passenger and freight movements. However, only 18% of the road network is paved, and poor road conditions lead to inefficiencies such as increased fuel consumption and prolonged travel times. These factors contribute to higher CO2 emissions.

While Angola has invested in rehabilitating its railways (e.g., the Benguela Railway), rail transport remains underutilised compared to road transport. Similarly, although maritime connectivity is relatively strong, it primarily supports international freight rather than domestic movement. The underdevelopment of these lower-emission alternatives limits their potential to reduce transport-related CO2 emissions.

---

[1]https://documents1.worldbank.org/curated/en/099150112022221069/pdf/P1769171067a8a0f718b251fd1c4a5f562f.pdf

[2]https://www.greenclimate.fund/document/enhancing-angola-s-access-climate-finance-sustainable-transport and-sustainable-landscape

[3]https://copperbeltkatangamining.com/angolas-electric-vehicle-fleet-grows-100-in-2024/

[4]https://www.menosfios.com/en/estrategia-nacional-prepara-angola-para-ter-15-milhoes-de-viaturas-eletrica s-ate-2035/

[5]https://unctad.org/system/files/non-official-document/dtltlbts_2024-07-23-sft_ago_prelim.pdf

Inadequate public transportation systems and reliance on informal modes like minibuses and motor taxis characterise urban areas in Angola. These modes are less efficient and contribute significantly to urban air pollution and GHG emissions. Efforts to introduce mass transit systems such as Bus Rapid Transit (BRT) have been proposed but not yet implemented.[6]

BARRIERS TO EV ADOPTION IN ANGOLA

Angola's pursuit of electric vehicle (EV) adoption has several challenges that impede widespread integration. Key barriers include:

1. Limited Charging Infrastructure: The scarcity of charging stations is a significant concern. As of late 2023, Angola inaugurated its first EV charging point in Luanda, highlighting the nascent state of the infrastructure. This limited availability leaves motorists anxious about where to charge their vehicles, deterring potential EV buyers.[3]

2. High Acquisition Costs: The initial cost of EVs remains prohibitive for many consumers. In regions across Africa, including Angola, comparatively low household incomes and limited access to affordable financing options make EVs financially out of reach for many. Addressing this challenge requires innovative approaches to make EVs more accessible and affordable to a broader population.[7]

3. Insufficient Consumer Awareness: There is a general lack of knowledge about EV technology among the populace. Limited consumer knowledge about the benefits and operation of EVs hinders adoption rates. Educational initiatives are essential to inform potential users about the advantages and feasibility of transitioning to electric mobility. [8]

4. Economic and Financial Constraints: High capital costs and limited access to affordable financing are significant barriers. African countries, including Angola, often face higher capital costs than developed nations, making investments in EV infrastructure and vehicles more challenging. This financial constraint hampers the ability to establish the necessary infrastructure and offer incentives for EV adoption.[9]

5. Energy Infrastructure Challenges: Despite Angola's potential for renewable energy, inefficiencies and reliability issues in the power grid pose challenges for EV adoption. A stable and consistent power supply is crucial for developing a dependable EV charging network.[10]

INFRASTRUCTURE DEVELOPMENT FOR ELECTRIC VEHICLES IN ANGOLA

The government's long-term ambitions include a target of 1.5 million electric vehicles on the roads by 2035, which anchors the urgent need for a robust charging infrastructure2. Despite these promising trends, the widespread adoption of EVs is constrained by the limited number of charging stations, creating "range anxiety" for users and impeding confidence in daily EV use.

The government has introduced policies to encourage EV ownership, including a 50% reduction in import and vehicle taxes until 2032 to lower upfront costs.

---

[6]https://www.codatu.org/en/ressource/angola-support-for-the-angolan-ministry-of-transport-2022-2025/

[7]https://possibleevs.com/main/2024/02/elementor-21858/

[8]https://unhabitat.org/join-us/calls/barriers-and-opportunities-to-the-adoption-of-electric-vehicle-technology-in-dar-es

[9]https://www.ft.com/content/b589f559-2949-4c52-a6e4-86807d04ee15

[10]https://www.nature.com/articles/s41598-024-75039-3

Several measures have also been proposed to guide infrastructure development, such as legislation incentivising charging-point investments and planning for a national network of stations. Alongside these incentives, an updated electricity law allows private-sector participation in the transmission grid, fostering new commercial models that could expand EV charging.

Role of the Private Sector.

Private companies have taken the lead in installing charging stations, seeing an opportunity to fill the infrastructure gap. Initiatives launched by local firms and foreign investors focus on two key areas: deploying fast chargers in urban centres and supporting off-grid charging solutions in remote areas. Several companies and organisations are involved in Angola's EV charging landscape:

1. **Angola Electric Charging Network (AECN):** A leading provider with a growing network of fast and ultra-fast chargers across urban and rural areas[11]
2. **Green Angola Charging Solutions (GACS)**: Focuses on sustainable practices with solar-powered chargers. [11]
3. **E-Power Stations Angola (EPSA):** Known for ultra-fast chargers and advanced technology solutions.
4. **ABB:** Provides comprehensive EV charging solutions, including DC fast chargers and AC wall boxes tailored to Angola's needs [12]
5. Other players include GreenTech Solutions, PowerElect Angola, and EcoCharge Providers[13]

[11]https://evcstar.com/ev-charger-manufacturers/top-roadside-electric-car-charger-providers-in-the-angola/

[12]https://mobilityforesights.com/product/angola-ev-charger-market/

[13]https://evcstar.com/ev-charger-manufacturers/top-commercial-ev-chargers-manufacturers-in-angola/

Angola aims to reach 9.9 GW of installed generation capacity and achieve a 60% electrification rate by 2025, supported primarily by hydropower and natural gas. Strengthening the country's grid involves building transmission lines, forming public-private partnerships, and establishing distributed generation in rural areas. Efforts to integrate renewables—such as solar photovoltaic and small hydro—also help diversify the power supply, which could support stable nationwide. charging infrastructure

STAKEHOLDERS IN ANGOLA'S E-MOBILITY SECTOR

Government Stakeholders

The Ministry of Environment promotes climate-change initiatives such as the Blue Skies & Net Zero 2050 Campaign, which aims to cut emissions and raise awareness about cleaner energy and transportation solutions.14 The Ministry of Energy and Water works on frameworks that allow private participation in the power sector; this is critical for deploying coherent electric mobility strategies by connecting charging infrastructure to the grid. Several policy instruments and sector reforms, including legislation encouraging independent power producers, also shape the enabling environment for e-mobility.

- **Government of Angola:** The government is central to creating policies and incentives for e-mobility adoption, such as reduced import taxes on EVs and plans for a National Electromobility Strategy. - It is also responsible for addressing regulatory gaps and promoting public-private partnerships to infrastructure expand EV

- **Empresa de Electricidade de Luanda (EDEL):** A state-owned enterprise managing electricity distribution in Luanda, EDEL is vital in ensuring grid readiness for EV charging infrastructure[14]. They Collaborate with private companies to integrate EV chargers into the existing power grid.

[14]https://gggi.org/the-angola-ministry-of-environment-launches-the-first-blue-skies-net-zero-2050-campaign-in-africa

- **Ministry of Energy and Water (MINEA):** Oversees energy policy, including renewable energy integration, which is crucial for sustainable EV charging solutions.
- **National Institute of Road Transport (INTR):** Regulates vehicle standards and could play a role in setting technical guidelines for EVs and charging stations.

Public Utilities

Three public utilities play an essential role in Angola's energy ecosystem. PRODEL is responsible for electricity production, RNT handles transmission, and ENDE oversees distribution. These entities are pivotal to ensuring a steady power supply and facilitating grid expansions to support the widespread adoption of electric vehicles and charging stations. Their modernisation efforts, combined with mini-grid or off-grid solutions, are central to achieving broader electrification and, by extension, e-mobility objectives.

Private Sector Stakeholders

A key contributor to Angola's electric mobility growth is CVE Angola, which recently launched the country's first public charging point in Luanda and projects the national fleet of electric vehicles to grow from 2,000 to 4,000 by 2024. Private companies are increasingly investing in both cars and their associated supply chains. Partnerships between domestic firms and foreign investors focus on installing chargers in urban centres. Market research entities also track Angola's EV penetration rates and highlight gaps in charging infrastructure to inform future investments. Automotive manufacturers have shown interest by aligning with battery technology companies, indicating a broader global shift toward clean transport solutions converging on Angola's market potential.

1. CVE Angola: A leading private company in electric mobility, CVE Angola launched the first EV charging station in Luanda and advocates for private sector leadership in the market.
2. ABB: Provides advanced EV charging solutions, including DC fast chargers and AC wall boxes, contributing to Angola's charging infrastructure development.
3. Nidec Corporation: Supplies ultra-fast charging solutions tailored to Angola's growing EV fleet
4. CFAO Motors Angola: Distributes electric vehicles and supports market growth through partnerships with global automakers like BYD and Mercedes.[16]
5. SGS Angola: Offers consulting, testing, certification, and homologation services for electric vehicles to ensure compliance with safety standards.[17]

International Partners

1. **ZTE Corporation:** A strategic partner in Angola's energy sector, ZTE collaborates with EDEL on projects that could extend to e-mobility infrastructure[15]
2. African Development Bank (AfDB): Supports sustainable energy initiatives that align with e-mobility goals through funding assistance18 and technical [18]
3. Green Climate Fund & Global Green Growth Institute (GGGI): Provide financial support for renewable energy projects that infrastructure.19

---

[15]https://www.zte.com.cn/global/about/magazine/zte-technologies/2014/4/en_645/425781.html

[16]https://www.cfaogroup.com/en/division/cfao-mobility-en/

[17]https://www.sgs.com/en-ao/services/e-mobility-services

[18]https://www.afdb.org/en/news-and-events/stakeholders-gather-in-angola-to-validate-national-sustainable-energy-for-all-se4all-action-agenda-and-investment-pros pectus-16095

[19]https://africa-energy-portal.org/sites/default/files/2022-09/new-31st-update-august-correction-ELECTRIC-VEHICLES-1.pdf

Policy and Strategic Framework

1. National Electromobility Strategy (2023–2035): Published in 2024, this strategy outlines a roadmap for introducing and scaling EV adoption in Angola. Key goals include building a nationwide charging network, incentivising EV imports through tax reductions, and promoting the use of electric vehicles in public transportation systems. The pilot phase (2023–2030) focuses on creating a legal framework for electromobility and deploying initial infrastructure projects.

2. Legislation: In 2024, Angola passed a law establishing a judicial regime for electromobility, supporting assembly plants and local battery manufacturing while reducing import duties on EVs until 2032.

3. Presidential Decree on Electro-mobility (2024): This decree sets rules for EVs' acquisition, use, maintenance, and charging. It also mandates the creation of a national network of charging stations accessible to all users, regardless of their service provider20. Economic operators must install accessible charging points, further boosting infrastructure development.

4. Tax Incentives: Angola has introduced a 50% reduction in import duties and vehicle taxes for EVs, effective until 2032. This measure is designed to lower the cost barrier for consumers and encourage EV adoption21

5. Integration with Renewable Energy: The government is leveraging its renewable energy strategy—targeting 70% renewable energy in the electricity mix by 2025—to power EV infrastructure sustainably. includes solar-powered This charging stations and mini-grids in rural areas.22

Environmental Considerations Greenhouse Gas (GHG) Emissions: Angola contributes only 0.21% of global GHG emissions but aims to reduce emissions by up to 35% by 2030 under its Nationally Determined Contributions (NDCs). Transitioning to EVs is a critical part of this strategy.

Air Quality: The adoption of EVs is expected to reduce urban air pollution caused by internal combustion engine (ICE) vehicles while lowering noise pollution in cities like Luanda.

Future Outlook

Angola's National Electromobility Strategy envisions a phased approach to scaling up EV adoption: By 2030: Establish legal frameworks and expand urban charging networks. By 2035: Achieve widespread adoption with 1.5 million EVs on the road and integrate renewable energy into charging systems. Long-term goals include electrifying public transport fleets and positioning Angola as a regional hub for EV manufacturing within the Southern African Development Community (SADC).

---

[20]https://www.africa-press.net/angola/all-news/angolan-govt-discuss-ways-to-boost-electric-vehicles-acquisition

[21]https://www.iea.org/data-and-statistics/data-tools/global-ev-policy-explorer

[22]https://www.alerrenovaveis.org/en/communication/news/changes-in-the-angolan-regulatory-framework-encourage-new-renewable-energies/

FINANCIAL STRUCTURES AND INVESTMENTS

Angola's financial structures and investments in the electric vehicle (EV) sector are evolving, with a mix of public, private, and international efforts to support infrastructure development and promote e-mobility. Below is an overview of key financial mechanisms, investment trends, and challenges:

1. Public-Private Partnerships (PPPs): Angola has restructured its PPP framework under Law No. 11/19 to attract private investment in infrastructure, including EV-related projects. The updated law simplifies approval processes and encourages risk-sharing between public and private entities23. PPPs are leveraged to develop charging infrastructure, renewable energy projects, and transportation systems.

2. International Financing and Grants: The African Development Bank (AfDB) has been a significant partner in Angola's energy transition. Its $530 million funding for renewable energy projects indirectly infrastructure supports EV by improving grid reliability and expanding clean energy access. Angola also accesses climate finance through initiatives like the Green Climate Fund (GCF) to support EV adoption as part of its Nationally Determined Contributions (NDCs).

3. Private Sector Investments: Companies like CVE Angola have invested in charging stations to address infrastructure gaps. The private sector is leading in driving e-mobility growth due to limited government resources. International firms such as ABB and Nidec Corp. also contribute by deploying advanced charging solutions in Angola.

CONCLUSION

EV growth in Africa is set to accelerate by 2030. Countries such as Morocco, Rwanda, and South Africa have emerged as pioneers, leveraging mineral wealth, policy incentives, and partnerships to build domestic EV ecosystems. However, widespread adoption across the continent remains hindered by persistent challenges like inconsistent policies, underdeveloped charging infrastructure, high costs, and reliance on fossil fuel-powered grids.

To bolster growth on the continent, these issues must be tackeled by establishing sustainable policies to support the growth of EVs, and enforcing them. Furthermore, local manufacturing in Africa would lead to increased growth of EVs, as well as creation of jobs and skill acquisition.

Finally, as we strive to attain a carbon neutral society by 2050, the decarbonization of the transportation sector through Electric Vehicles (EVs) cannot be overstated.