United Nations
Economic Commission for Africa

# The e-vehicles in Africa: market and challenges

**Placide Badji, ECA**

ideas for a prosperous Africa

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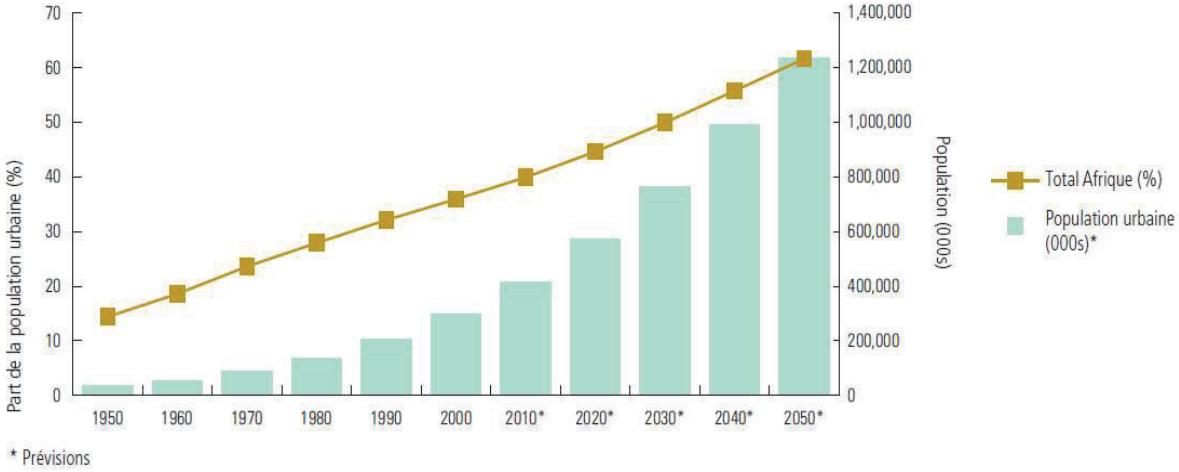
# Context

- Rapid urbanization, increasing incomes, and the rise of a middle class: Urban areas contained **472 million people in 2018**, and will double over the next 25 years (Center for Strategic and International Studies, 2018)

- Africa's middle class has tripled over the last 30 years. The current trajectory suggests that the African **middle class will grow to 1.1 billion (42%) in 2060** (Deloitte, 2013)

- AfCFTA requires over **2 million trucks by 2030** (ECA, 2022)

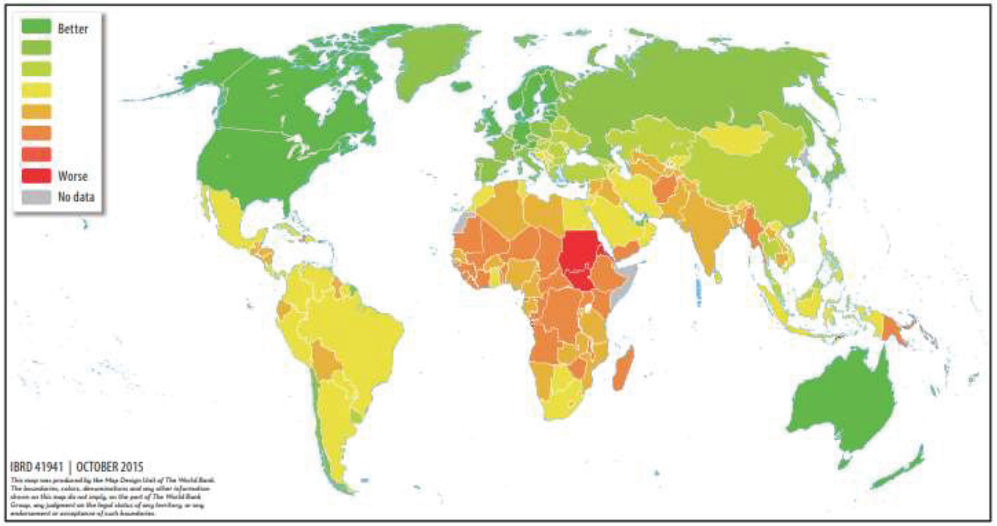



***The vehicle parc is expected to grow from 25 million vehicles to an estimated 58 million by 2040, driven by urbanization and rising incomes***

# Transport and global climate challenge

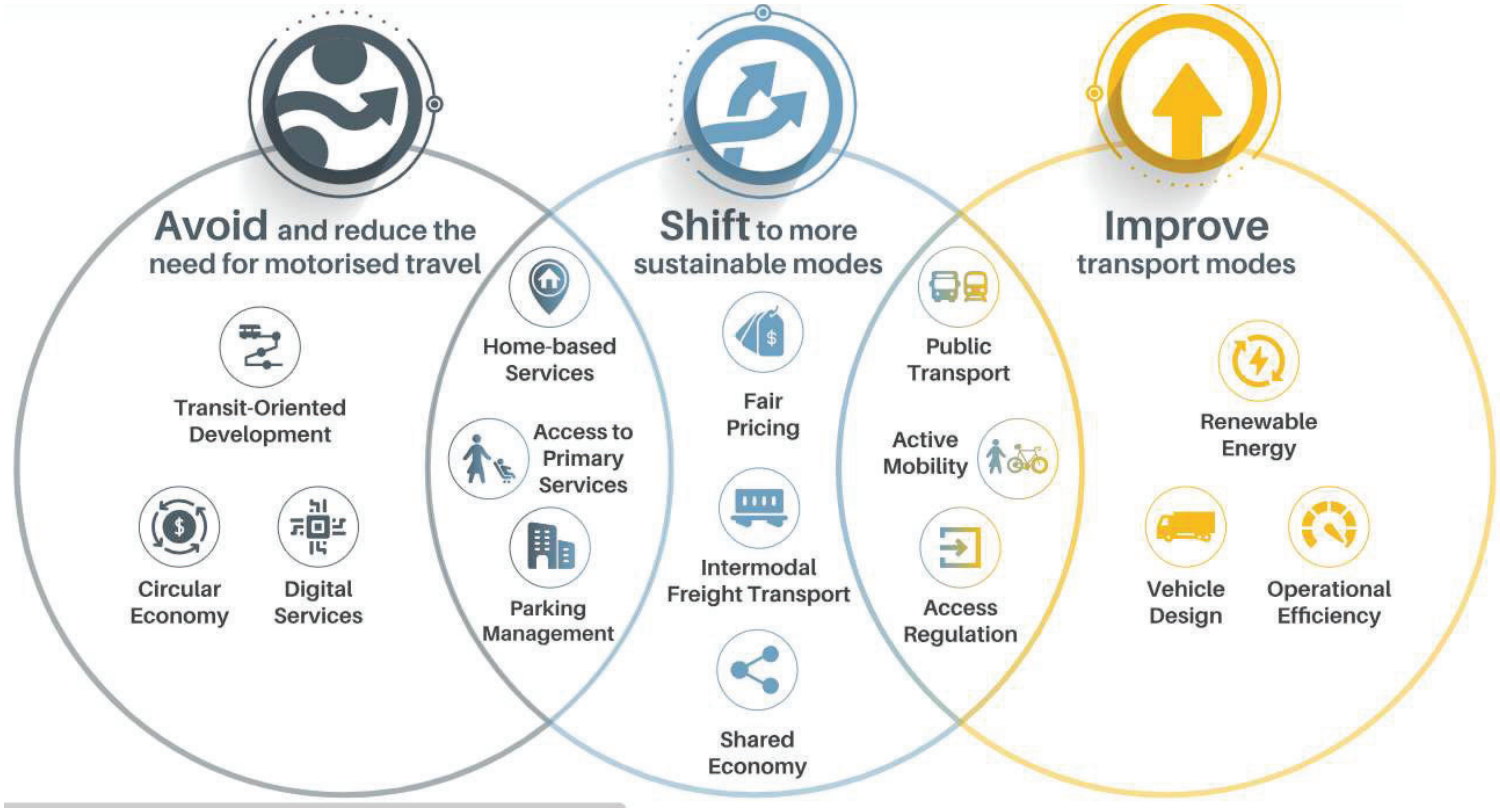
- Transport enables development, but causes traffic congestion, pollution, noise, and road accidents.
- The contribution of the transport sector to increasing greenhouse gas emissions (GHG) and fossil fuel consumption have been at the center of global discussions on climate change.
- Air pollution was responsible for approximately **1.1 million deaths in Africa in 2019**, making it the second leading cause of death in the continent (Shindell et al., 2022)

Vulnerability to the risks of Climate Change and other global Challenges




Source: University of notre dame global adaptation index (nd-gain)

# Avoid-Shift-Improve Framework




- A transition to e-mobility currently will reduce vehicle emissions by 50% in Africa.

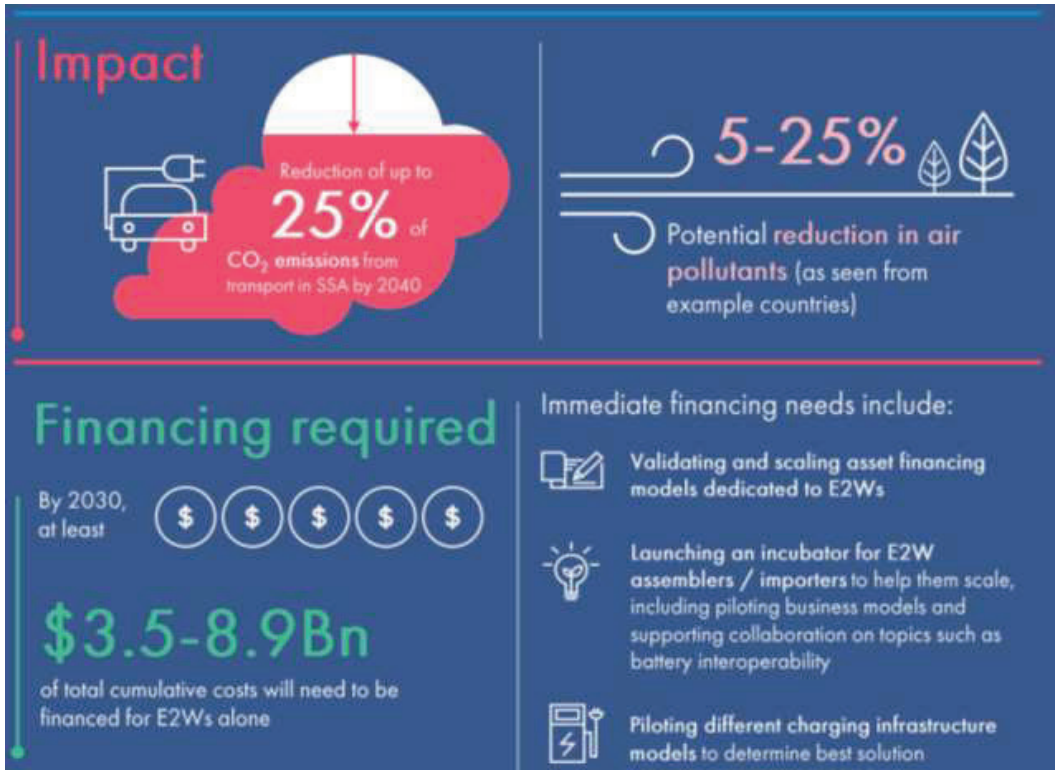
Source: SLoCaT, 2018

# Electric vehicles in Africa today

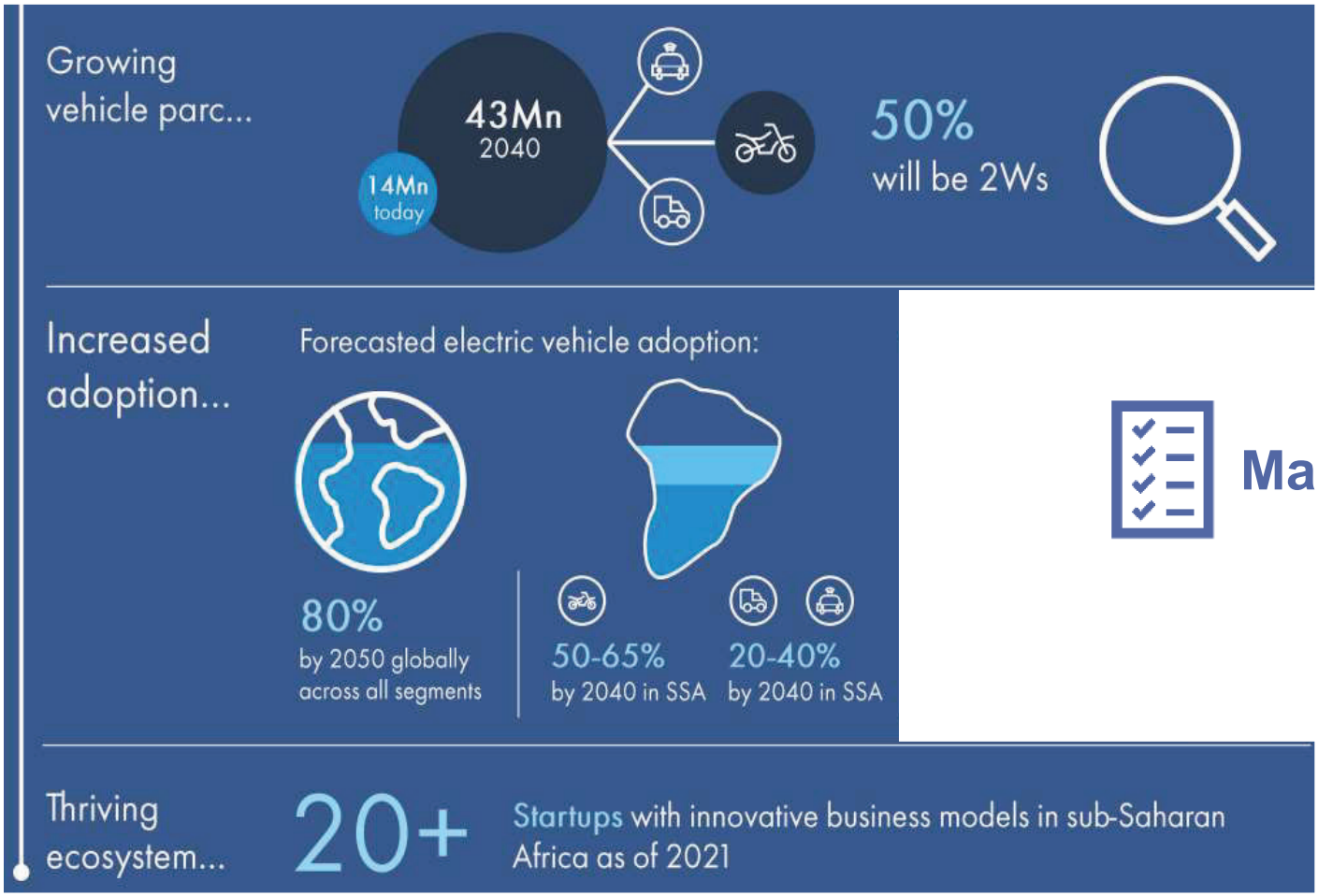
- Some governments in sub-Saharan Africa have started to announce electrification targets for vehicles and incentives for EV adoption—such as Rwanda's (*duty-free or reduced import rates for electric vehicles and related parts. The growth of an EV startup ecosystem is also contributing to these efforts*).

- A growing start-up ecosystem for EVs, focusing particularly on electric two-wheelers, is emerging in the region.

- McKinsey estimates that as of the end of 2021, there were more than 20 start-ups in the ecosystem EV, which combined raised over $25 million in funding that year.




Source: Shell Foundation, 2022

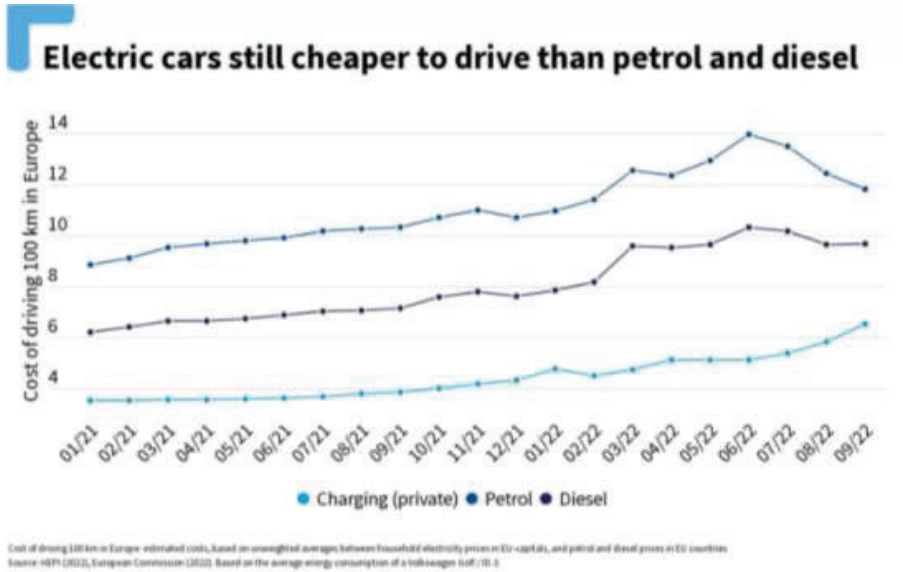



## Market outlook

**Source**: Shell Foundation, 2022

# Are E-Vehicles the most economical option?

- Electric vehicles have the lowest operating expenses.
- Low energy consumption. Over 77% of the grid electricity is converted to power at the wheels in EVs. Only about 12 percent to 30 percent of the energy in gasoline is converted to power at the wheels in standard automobiles.
- Despite their typically higher purchase price, EVs are ultimately more cost-effective than gasoline or diesel engines over time.
- Depend on: cheap charging, tax breaks, government subsidies, longer lifespan, and a decent infrastructure for EV in your area.




*Recharging an EV at home or at the office is still much cheaper than refuelling at the pump, according to T&E's calculations.* - Courtesy Transport & Environment

https://www.fueleconomy.gov/feg/evtech.shtml

# Market outlook

From the supply chain perspective

Africa's focus

| Mining | Metals | Precursor Production | Cell Production | Cell Assembling | Electric Vehicles |
|---|---|---|---|---|---|
| Lithium, Nickel, Cobalt | Smelt and refine | Precursor | Cells | Battery | |
| ALBEMARLE, NORNICKEL, GLENCORE, VALE | BHP, HUAYOU COBALT, JINCHUAN, TDC | JM Johnson Matthey, SUMITOMO METAL MINING CO., LTD. | umicore, BASF We create chemistry | CATL, LG Chem, Panasonic, SAMSUNG SDI | RENAULT |
| **Market Value by 2025** | $11b → | $44b → | $271b → | $387b → | $1.18t → | $7t+ |

Kwasi Ampofo / Bloomberg

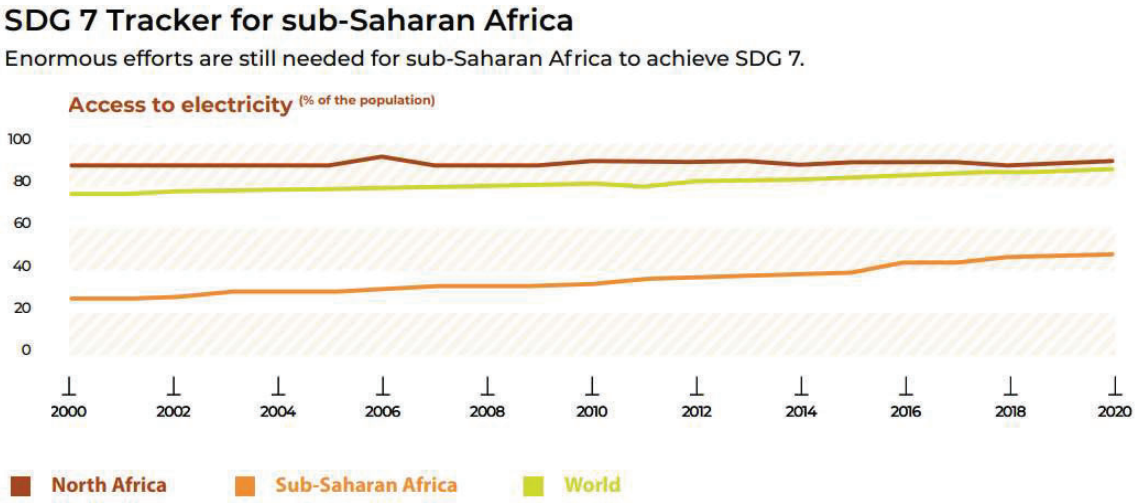
# Challenges in electric mobility transition in Africa

- Used vehicles


- Uganda: 95% of fleet consists of relatively inexpensive used vehicles imported from Asia
- Ethiopia: used cars constitute 85% of vehicle fleet
  - Country imported 135,457 vehicles in 2019, 30,834 more vehicles than in 2018.
  - Average age of imported vehicle rose from 15.5 years in 2000 to about 20 years in 2016 (> 25 %)

# Challenges in electric mobility transition in Africa

- Unreliable electricity supply,
- Unavailability of energy
- Availability of charging infrastructures ??




Source: RES4AFRICA, 2023

- 51.5% of people in Sub-Saharan Africa have access to electricity.
- The 2020 System Average Interruption Disruption Index (SAIDI) for **sub-Saharan Africa was 39.30 versus 0.87 for OECD** high-income countries.

# ECA is engaged

- ECA constructed/installed electric charging stations in its premises and gives priority to the purchase of EVs. Important to notice that at the headquarter/Addis-Ababa, 100% of the electricity is renewable, clean.

- ECA is also committed for the local manufacture of batteries for E-vehicles in Zambia and DRC in the frame of the African Continental Free Trade Area (AfCFTA)

# Opportunities

- **The market of cars in Africa is constantly growing**

- **Africa has the resources to become a renewable powerhouse**. The solar capacity potential is estimated at 10 TW, hydro energy at about 350 GW, wind at 110 GW, and geothermal resources at 15 GW. It has the potential to generate up to 24,000 TWh of electricity each year – 90% of the world's electricity production in 2018 – and 26 times that currently generated by the continent (AfDB, 2018)

- **Critical minerals, such as lithium, cobalt, platinum, and rare earth elements**, are becoming increasingly vital to meet the rising global demand for batteries, solar panels, wind generators, etc.

- **The African Continental Free Trade Area (AfCFTA)** represents an opportunity to promote production and related value chains

- **The existence of legal instruments, continental agreements and programmes on transport** (SAATM, TAH, African Maritime Transport Charter, PIDA, African railway network, Corridor authorities, etc.) constitutes an opportunity

**Table**: Major sources of raw materials for batteries and fuel cells

| Raw materials | Source countries |
|---|---|
| Cobalt | Australia; Canada; Congo, Dem. Rep.; Cuba; Philippines; Russian Federation |
| Copper | Australia; Chile; China; Congo, Dem. Rep.; Peru; United States |
| Graphite | Brazil; China; Türkiye |
| Lithium | Argentina; Australia; Bolivia; Chile; China; Russian Federation; United States; Zimbabwe |
| Manganese | Australia; Brazil; South Africa; Ukraine |
| Nickel | Australia; Brazil; Canada; China; Cuba; Indonesia; New Caledonia; Philippines; Russian Federation |
| Platinum | Russian Federation; South Africa; Zimbabwe |

*Sources:* NOW 2020a; USGS 2021.

# Recommendations

- Innovating local production and supply chains
- Consider regulatory mechanisms
- Finance assets, assemblers, and infrastructure
- Produce guidelines on vehicle inspection and explore all specific aspects related to safety in the safe system perspective.
- EVs alone are not enough for sustainable transport: need of combination with mass transit, active mobility, clean energy, etc
- Set harmonised standards for the continent in the frame of the AfCFTA

# Thank you !