Electric vehicle infrastructure south africa

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In sub-Saharan Africa, high levels of particulate matter (PM2.5) pollution from vehicle tailpipe emissions cause poor health, developmental stunting, and even death. Vehicle emissions also contribute to global warming.

Electric vehicles could help solve these problems but they"ve been slow to take off in the region. Its biggest economy, South Africa, had only about 1,000 electric vehicles by 2022.

We are specialist transport engineers whose research has focused on electric vehicles and road freight transport in sub-Saharan Africa. In our work we look at how electric vehicles could contribute to reducing emissions in the region, and what is standing in the way of electrifying transport.

The inability of countries to generate and distribute enough clean electricity is also a barrier to electrifying vehicles. Just over half of all electricity in the region comes from burning fossil fuels. Powering electric vehicles with electricity generated by burning fossil fuels wouldn"t necessarily reduce carbon emissions.

However, the rollout of electric motorcycles and small public transport vehicles has already begun. If all vehicles could be made locally, using clean energy, there would be tremendous economic benefits for the region.

Transitioning to electric mobility requires clean energy provision, which means investing in electricity infrastructure. Electric vehicle charging stations can be installed fast: South Africa already has a very high electric vehicle ratio of one charger for every five cars, compared to the UK at 1:20. But these charging stations must be able to deliver electricity when vehicles need it. They need reliable, renewable energy stored in large battery systems to do so - and these large battery systems are still being developed.

In sub-Saharan Africa informal public transport moves about 72% of the region"s passengers. Freight moves goods in the absence of adequate rail. Electrifying these sectors needs careful planning.

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Informal "paratransit" or "popular transportation" is made up of minibuses (matatu, ndiaga ndiaye, danfo, trotro), three-wheelers (tuk-tuk) and motorbikes (boda boda, moto).

Planning for the eventual electrification of informal taxis is complicated by the sector"s unscheduled, decentralised, often chaotic and demand-driven nature.

Freight transport is a leading indicator for economic growth, and for economies to grow, freight transport must grow. This means that national and local governments must plan and invest in high powered, fast charging stations along transport routes. These must be able to charge different sizes and kinds of trucks. The freight industry cannot absorb these costs alone.

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