



MovingIMPACT

Project overview

14 July 2026

This work was supported by UK Research and Innovation through the Ayrton Challenge Programme [Award reference UKRI314]



UK Research
and Innovation

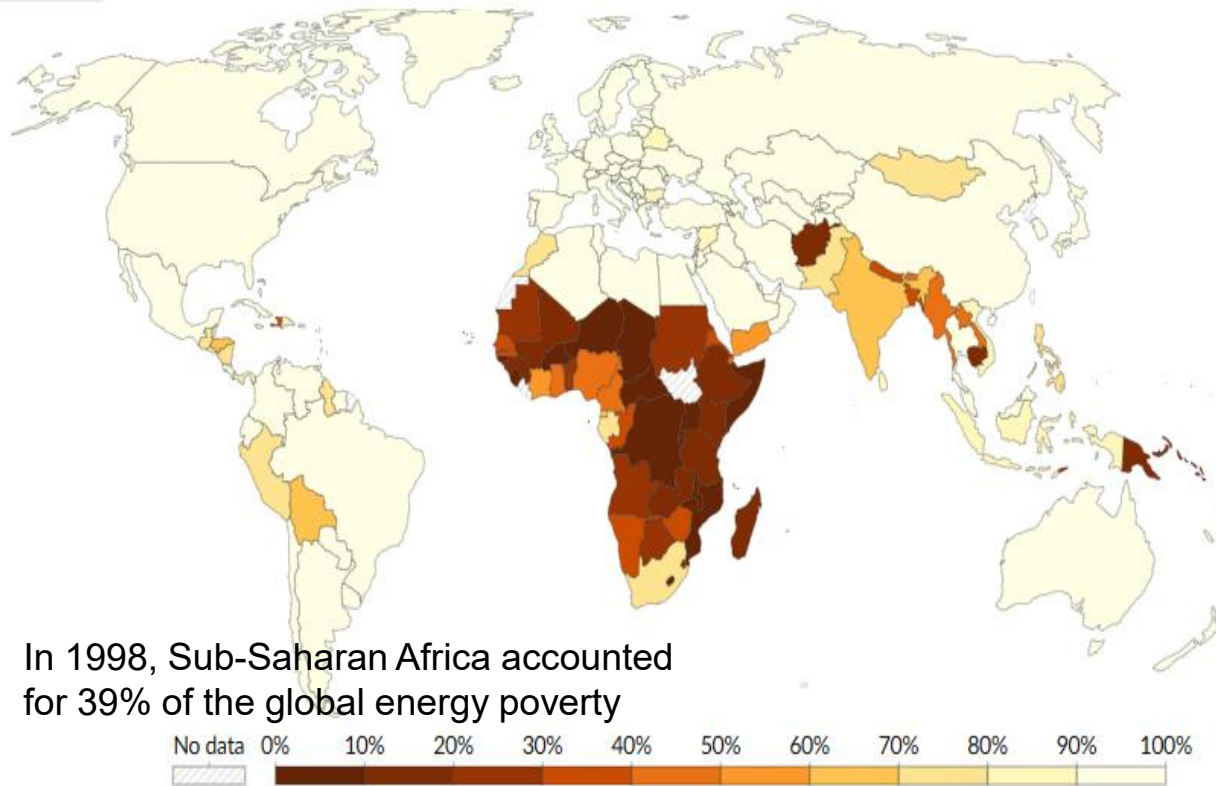


AYRTON
FUND

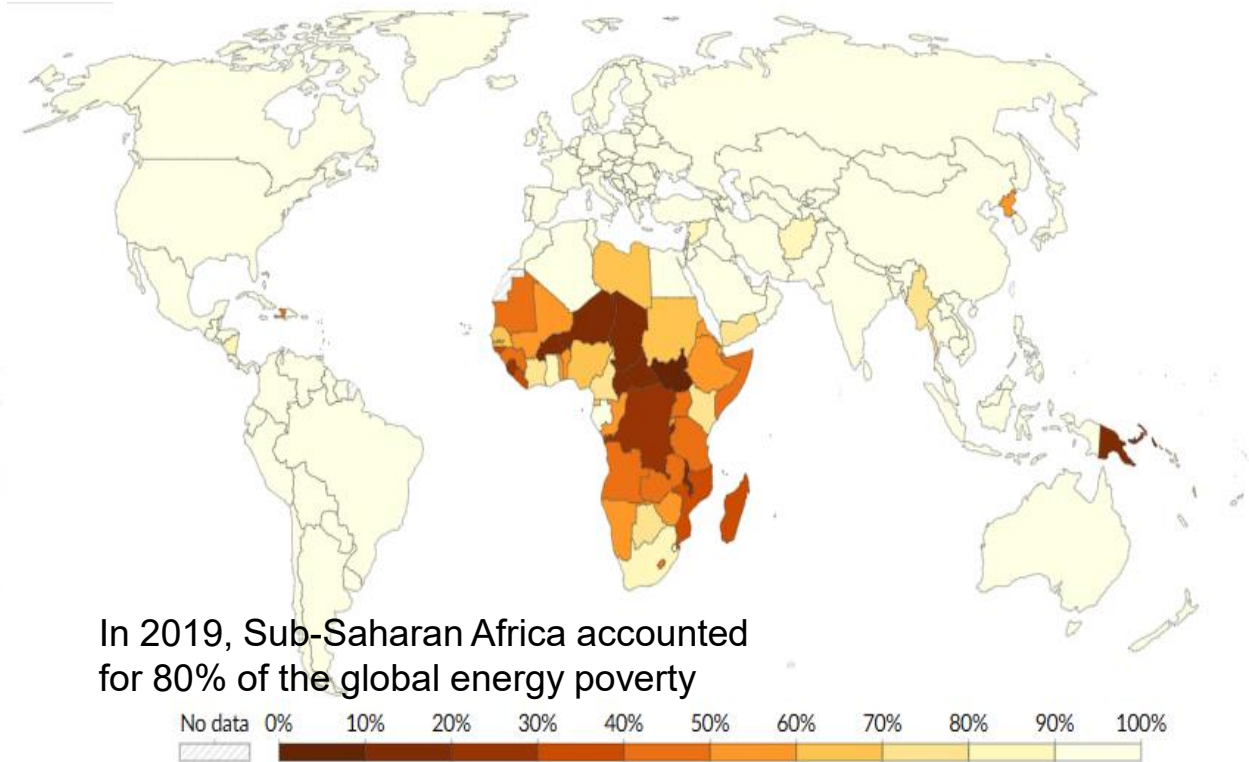
Electricity access worldwide

Access to electricity has improved greatly in the recent past but growth has been uneven. Sub-Saharan Africa remains a big challenge.

2002



2022



source: <https://ourworldindata.org/grapher/share-of-the-population-with-access-to-electricity>

Research themes



Agrivoltaics



**Household
energy access**

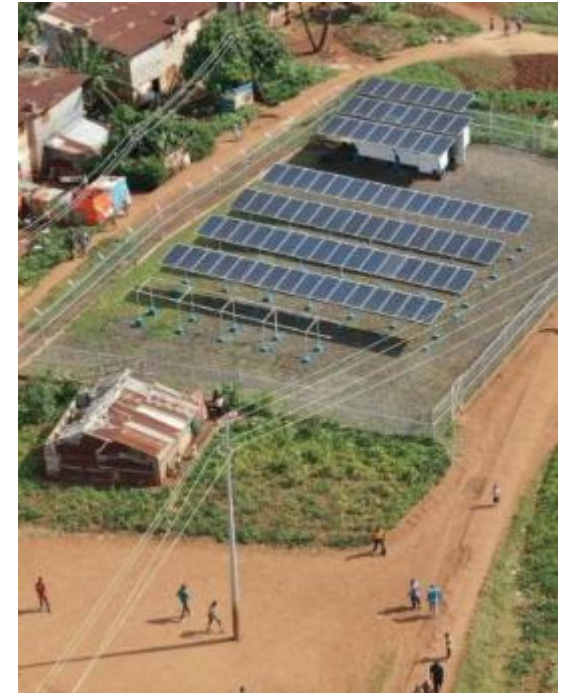


**Charging
infrastructure
for small EVs**



Images courtesy of Ampersand Ltd. Rwanda

**Mini-grid support
for national grids**



Images courtesy of BBOX Ltd. Rwanda

**Socio-economics
Capacity building**



Moving**IMPACT**

Can 2 / 3-wheelers EVs and mini-grids benefit each other in sub-Saharan Africa?

14 July 2026

**Phil Churchman, Richard Oduro
and Sheridan Few
University of Leeds**

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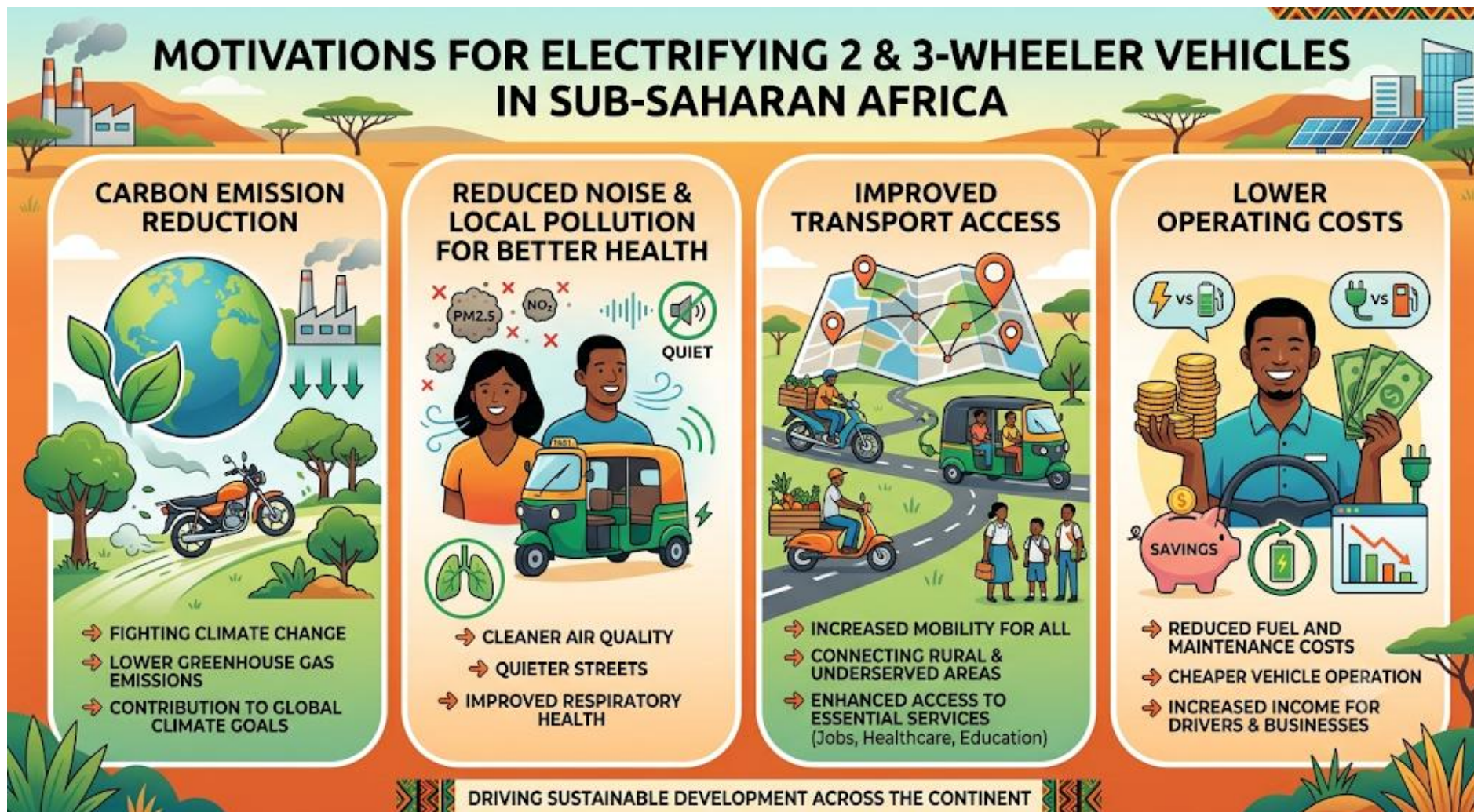


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Strong motivations to electrify 2/3-wheelers



The EV transition in sub-Saharan Africa is happening



YaleEnvironment360
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E360 DIGEST
JUNE 22, 2026

Amid Iran War, Africa Sees Growing Demand for Electric Motorbikes



A motorbike taxi. AMPERSAND

As the Iran War has driven up fuel costs in Africa, demand for electric motorbikes has grown.

Motorbike taxis – motorcycles with room for one paying customer – are a major mode of transport in

NewAfrican

Opinion

Electric mobility: Africa is pulling ahead



Written by **Kaushik Burman**
Published March 13, 2026

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The European Investment Bank's €1 billion commitment to renewable energy projects across Sub-Saharan Africa highlights a broader shift underway: the continent is rapidly becoming a key arena for the global energy transition.

techcabal Insights
Request Research

Home / Insights / Africa's E-Mobility boom is happening on two wheels

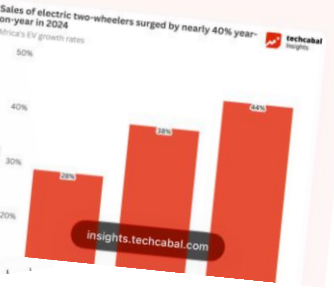
CleanTech Insights

Africa's E-Mobility boom is happening on two wheels

ADEDAYO OJO
PUBLISHED 9TH MARCH 2026

Africa's electric mobility transition is being won by the vehicles that already form the backbone of its urban economy: motorcycles and tricycles. While electric models currently represent a fraction of the continent's 30–40 million vehicles, the momentum is undeniable, with sales of electric two-wheelers surging by nearly 40% in 2024.

Sales of electric two-wheelers surged by nearly 40% year-on-year in 2024
Africa's EV growth rates



Year	EV Growth Rate (%)
2023	28%
2024	38%
2025	44%

insights.techcabal.com

UN environment programme

13 DEC 2024 | STORY TRANSPORT

How electric vehicles are helping Asia, Africa take a bite out of greenhouse gas emissions



Credit: Adobe Stock.

At dawn, Dorothy Mae Dumawal strolls past a fleet of electric three-wheeled vehicles charging at a government-owned parking lot in Pasig City, Philippines. In a short while, the vehicles, which belong to the Philippine Postal Corporation, will set off on mail runs across bustling Pasig City, part of metro Manila.

"Before this charging station, our drivers had to rush home whenever their batteries ran low," says Dumawal, who manages the fleet. "Now, they can simply stop here, take a short break while charging and continue serving our community."

The vehicles are among 30 deployed in Pasig City

Electric vehicles + Add to myFT

Iran war supercharges electric vehicle uptake in Africa

Boom in demand for electric motorbikes and buses on continent is a boost for China



A Spiro electric motorcycle taxi driver carries a passenger in Kigali, both wearing helmets and blue Spiro vests © Clement Di Roma/AFP/Getty Images

William Wallis in Nairobi
Published JUN 22 2026

[Listen to this article](#)
7 min listen

The global energy crisis sparked by war in the

Supportive policies in several countries

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Ethiopia

- ICE import ban
- EV tax and tariff cuts
- Infrastructure mandates



Rwanda

- 30% public procurement mandate
- EV tax holiday to 2028
- Kigali petrol moto registration cap



Kenya

- 0% VAT and excise duty on EVs
- Corporation tax reduction for first 5 years for local EV assemblers



Ghana

- 8-year tax holiday on imported components for locally assembled vehicles



Nigeria

- 0% import duty on EVs
- 30% local component sourcing mandate



Uganda

- 0% VAT on locally assembled EVs
- 50km radius charger infrastructure plan

Different vehicle uses

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**Agriculture and utility
(aboboyaa)**



**3-wheeler taxi
(pragya)**



**2-wheeler taxi
(okada)**



Delivery riders

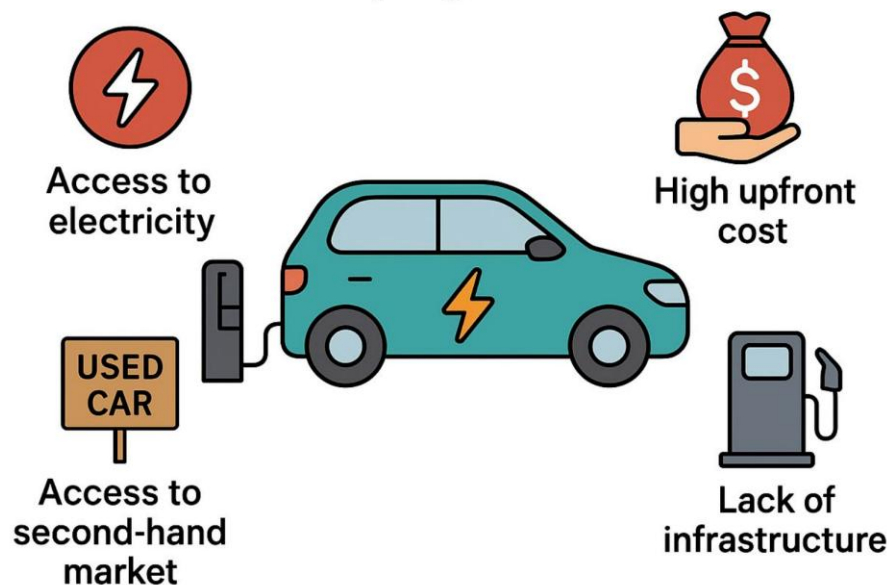


+ patient transport and private vehicles

Dependent on sufficient reliable electricity supply



Factors Blocking the Development of EVs in Developing Countries



Source: (Ka et al., 2026)

Barriers

Unreliable energy supply

High costs and limited accessibility

Lack of supportive infrastructure

Fiscal and trade-related barriers

Transition support

Enablers

Energy supply stabilisation

Targeted fiscal incentives

Cross-government coordination

Charging infrastructure development

Clear and supportive policy framework

Source: (Mateko et al., 2026)

Mini-grids may help

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- Bolster main grid capacity and reliability
- Provide power in remote locations where main grid does not reach



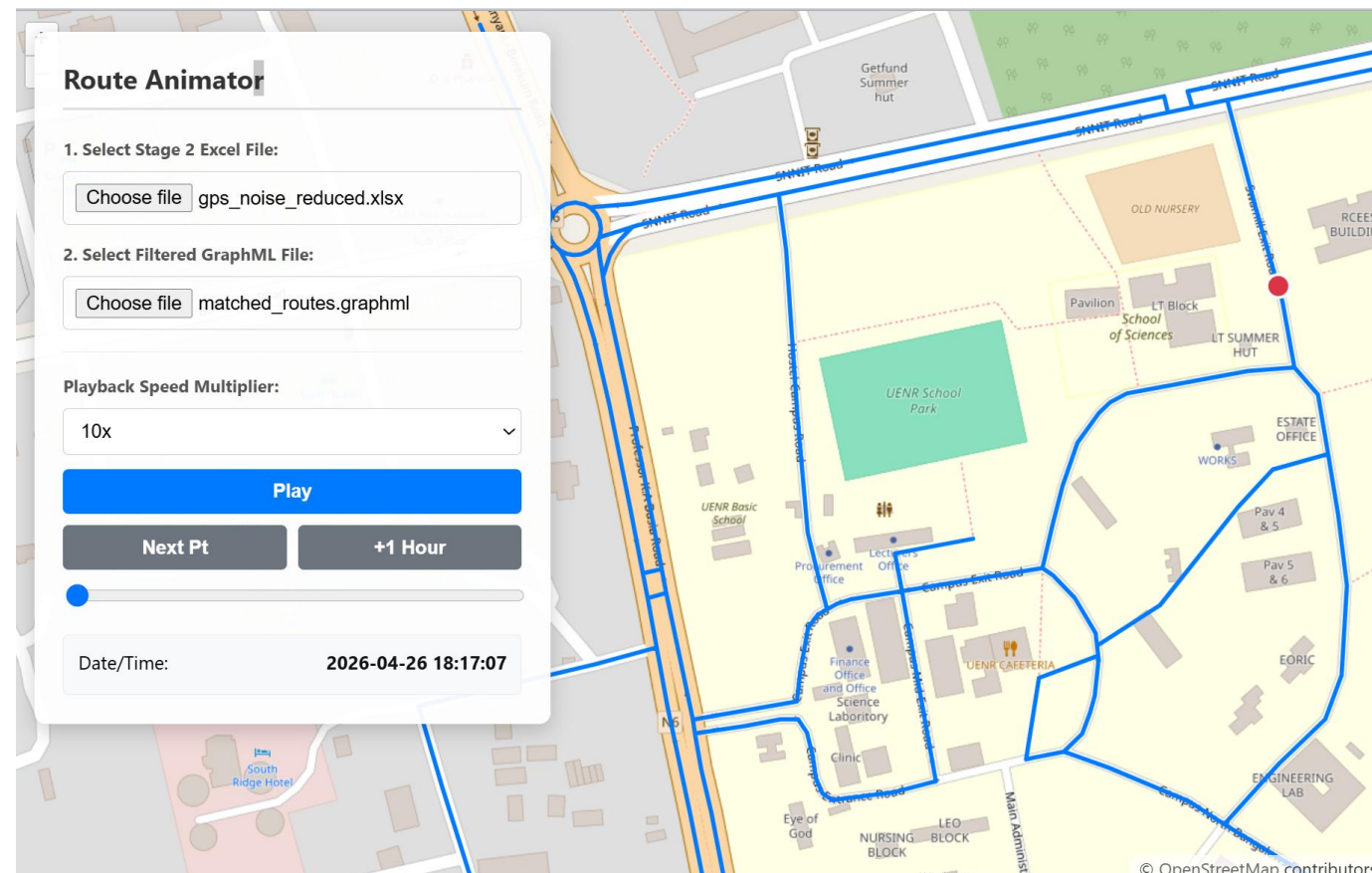
However, the devil is in the detail



- What amount of power is required when and where?
- How does this align to other demands on mini-grids and the main grid?
- When is battery swapping a better solution than static charging?
- How much charging will be done privately versus at public chargers?
- What is a minimum viable public charging / battery swap network?
- What is the additional load on the main grid and mini-grids?
- What are the implications of this for energy and infrastructure providers?



Cleaning and visualising data

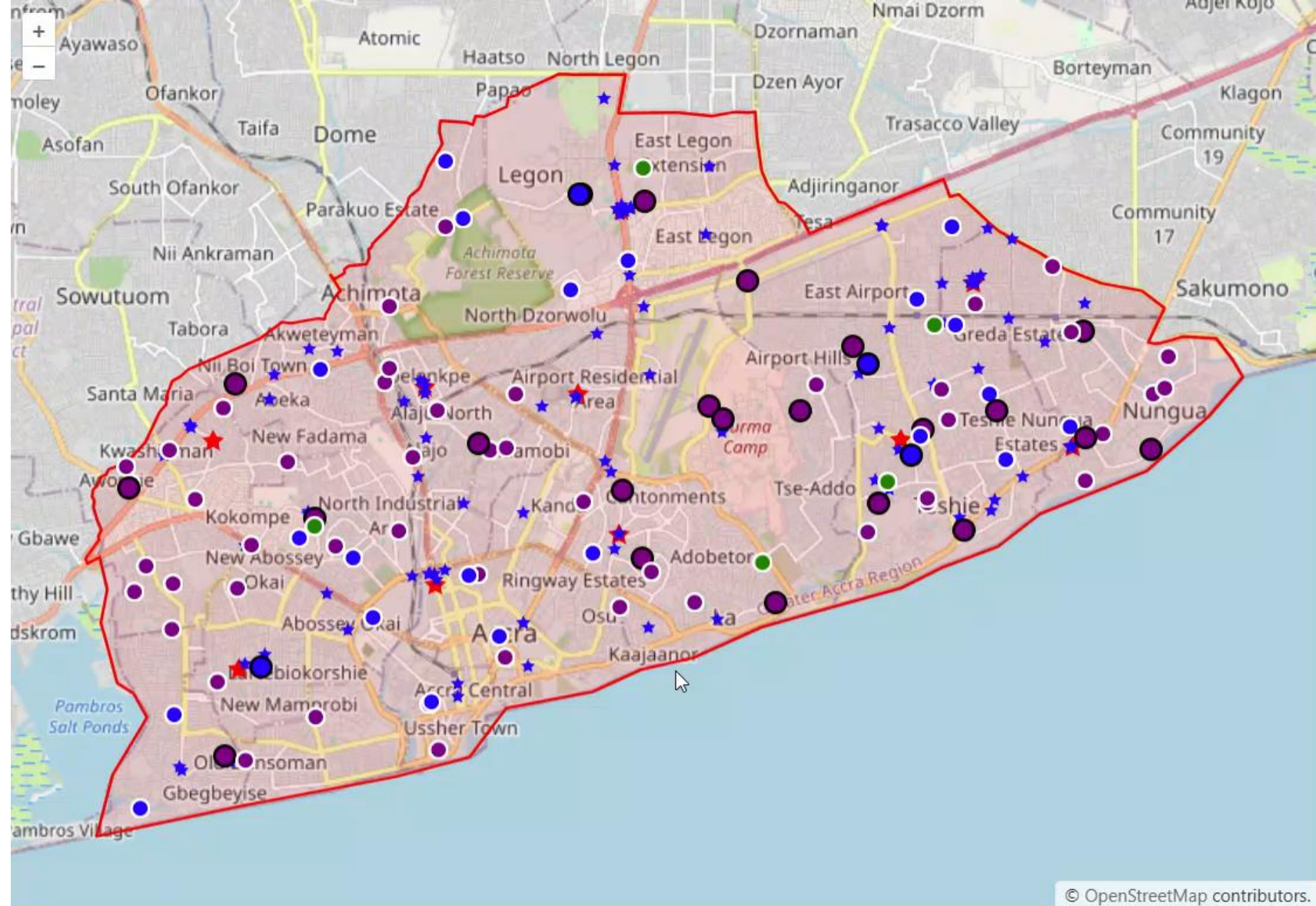




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Simulation

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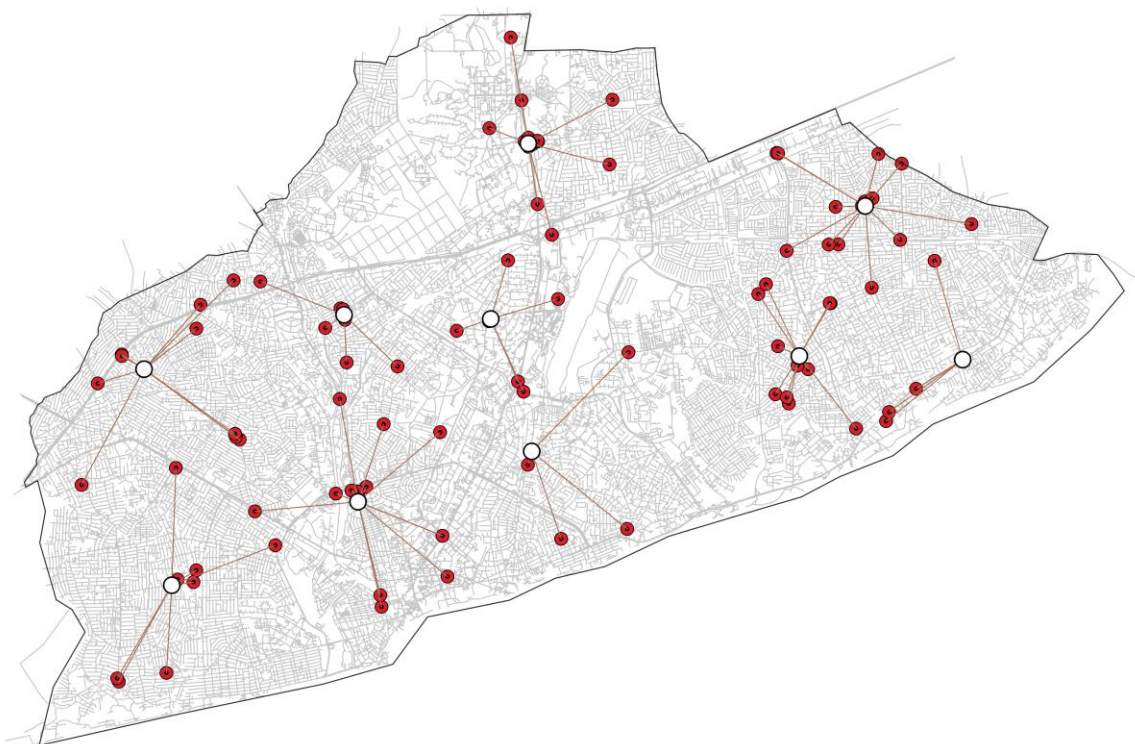
Stop Reset Speed: 360x Timeline: 01/01/2025, 05:01:18

Trip Type: ● Taxi rank ● Hail ● Passenger ● Swap ● Idle **Locations:** ★ Swap station ★ Taxi rank

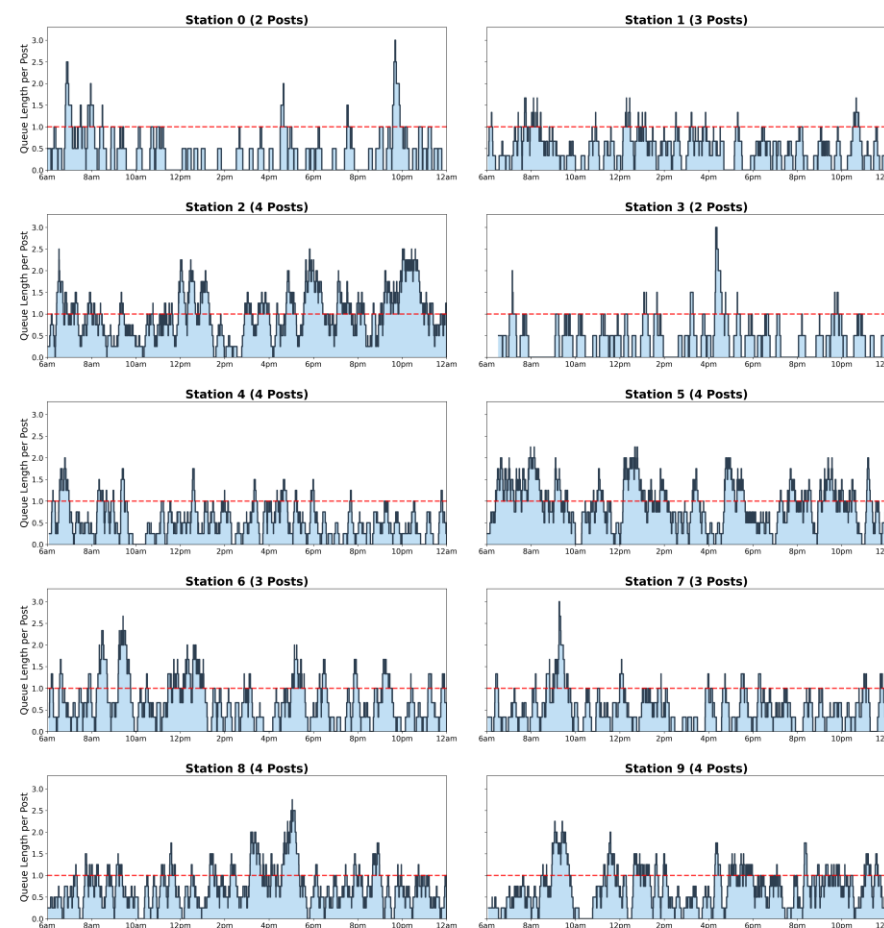
Active Agents: 100

Optimising station locations and capacities

Optimal locations



Queue lengths



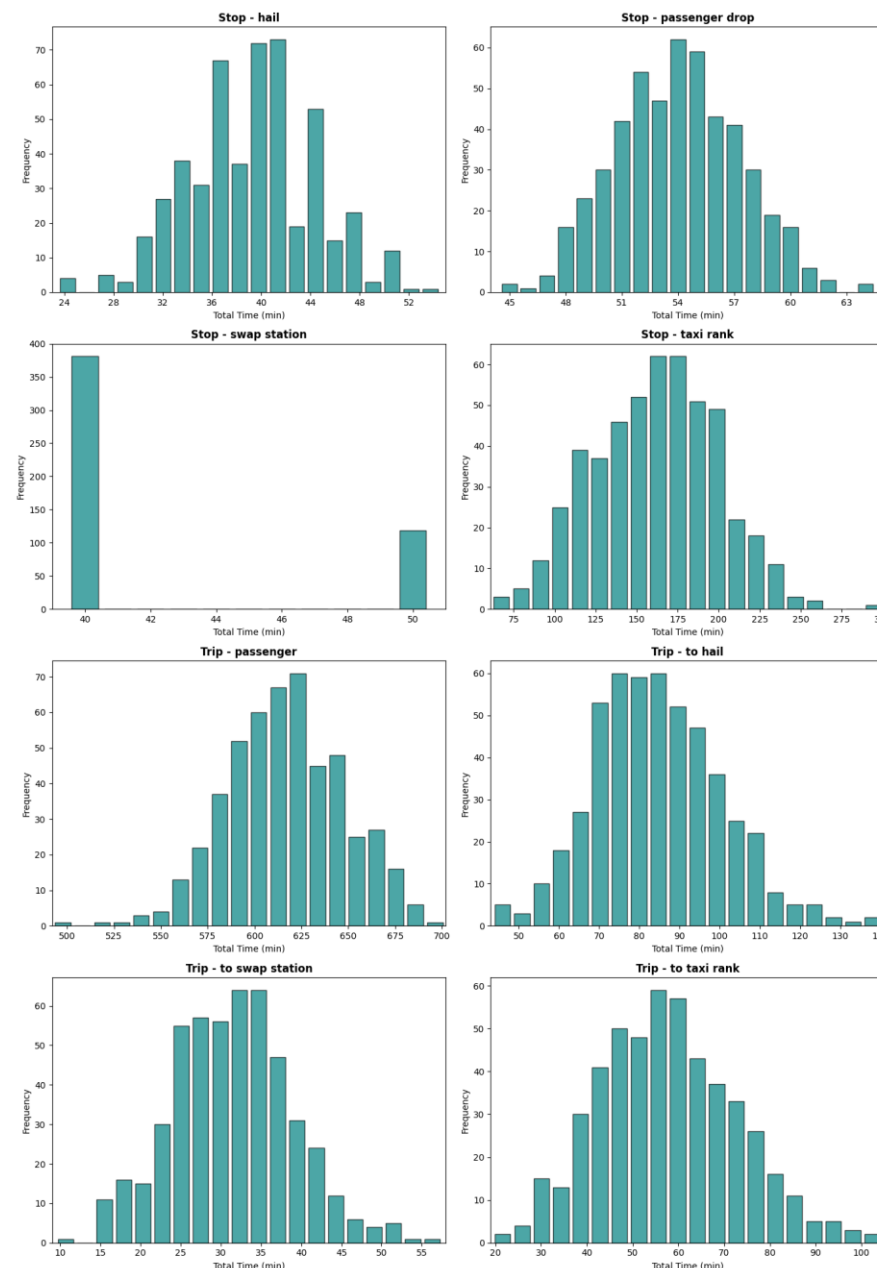
Analysing vehicle productivity

Time spent on different activities

Activity Type	Max Time (min)	Min Time (min)	Average Time (min)	Std Dev (min)
Stop - hail	54	24	39	5
Stop - passenger drop	64	45	54	3
Stop - swap station	50	40	42	4
Stop - taxi rank	300	62	162	37
Trip - passenger	701	494	616	31
Trip - to hail	139	45	84	16
Trip - to swap station	57	10	31	7
Trip - to taxi rank	104	20	58	15

Average percent of total time spend on passenger trips:

$616 / 1080 \text{ mins (18 hours)} = 57\%$



The outcome?

THE VIRTUOUS CIRCLE: ENERGY COVERAGE, ELECTRIC VEHICLES, & INFRASTRUCTURE INVESTMENT

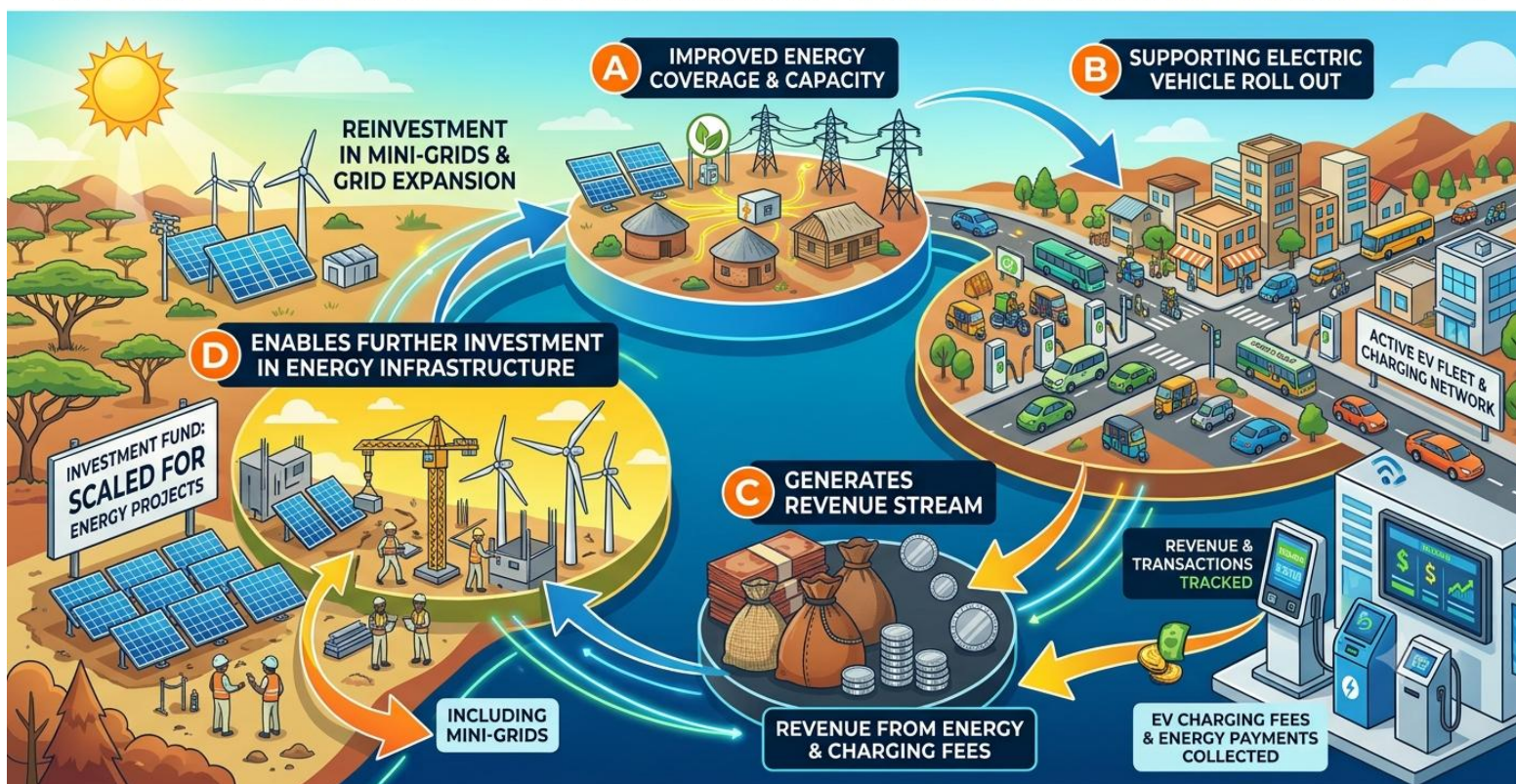


Image generated using Google Gemini

- Increased energy independence and reduced exposure to volatile fossil fuel markets
- Cleaner, quieter vehicles and environment
- Improved transport access
- Higher capacity and more resilient energy system supporting other energy demands
- Contribution to climate change mitigation goals