SOLUTIONSplus

Integrated Urban Electric Mobility Solutions in the Context of the Paris Agreement, the Sustainable Development Goals and the New Urban Agenda
In Co-flagship project on Urban mobility and sustainable electrification in large urban areas in developing and emerging economies.

Funded under the Horizon 2020 call GV-05-2019
Duration: 1 January 2020 – 31 June 2024
Total budget: €20,233,098.75
(EU Contribution: €17,970,258.75)
Consortium of 47 partners, 116 associated and support partners

10 Living Labs:
Asia: Kathmandu (Nepal), Manila/Pasig (Philippines), Hanoi (Vietnam), Nanjing (China)
Africa: Kigali (Rwanda), Dar es Salam (Tanzania),
LATAM: Montevideo (Uruguay), Quito (Ecuador),
Europe: Hamburg (Germany), Madrid (Spain)
Sustainable and electric urban mobility

Figure 2: Avoid-Shift-Improve paradigm (UN-Habitat)
Accelerate transformational change towards sustainable urban mobility through innovative and integrated electric mobility solutions.
Africa Demonstration Actions

Rwanda
- Electric motorcycles & gender
- Electric bicycles
- Electric buses
- Institutional coordination
- E-mobility policies

Tanzania
- Electric tuk-tuks
- Electric bicycles
- Awareness raising
- Policy advice
Focus of Africa replication actions

**Kenya**
Electric motorcycle & gender
Passenger taxi services

**Togo**
Electric bicycles & gender
Urban deliveries

**Uganda**
Electric motorcycle & gender
Passenger taxi services

**Sierra Leone**
Electric motorcycle & gender
Passenger taxi services

**Uganda**
Electric three-wheelers & gender
Peri-urban product deliveries

Africa Replication Actions
Urban Living Lab approach

City project co-design and implementation
Seed funding, incubator business models
Impact assessment
Capacity building, Policies & Scaling

Core Lab partners in Dar es Salaam & Kigali

Supporting partners
**SOLUTIONSplus Objectives & Concept**

**INITIATE**
Initiate partnership among local and European companies; business models.

**INSPIRE**
Exchange among city officials, transport operators and entrepreneurs.

**IMPLEMENT**
Implementing innovative, sustainable e-mobility solutions in cities.

**INFORM**
Comprehensive toolbox on e-mobility solutions.

**IMPACT**
Integrate innovations into local, national and global policy and planning.
Results

Demonstration Actions
Inform

Data on the feasibility to electrify feeders

- E.g. Dar es Salaam: **unprecedented data collection** to assess the feasibility of electrification of e-bajajs
- Collaborative and inclusive approach

Impact assessment (extracts)

- **Financial viability**
  - Business model highly attractive for drivers of e-motos in Kigali: Internal Rate of Return of 42%
  - Viable for companies, e.g. e-bajajs in Dar es Salaam: IRR of 22.5%. Challenges exist though, e.g. risks of drivers’ payment default

- **Environmental benefits**
  - GHG emission reduction of 73% with e-motos compared to ICE motos in Kigali, 95% with electric bicycles replacing ICE motos in Dar es Salaam
  - Overall impacts depending on the pace of introduction and phasing out of ICE motorcycles
Multiple training content & formats

- **Africa regional training based on needs**
  - 2021: EV Charging Infrastructure
  - 2022: EV Batteries & End-of-Life Management
  - 2023-2024: Public Transport Electrification; Integration of Paratransit, eBRT

- **Global City peer learning** e.g. e-bicycles, e-bajajs
- **Study visits** e.g. Bogota, Madrid, Hamburg
- **Online E-courses**: e-mobility within sustainable urban mobility; public transport electrification; MaaS and ITS; paratransit electrification; E-freight
- **Toolbox of resources** on e-mobility

Organising Africa peer exchange on e-mobility

- First E-Mobility Forum in Dar es Salaam, 2023, with Tanzanian stakeholders and delegates from 17 sub-Saharan countries
- Second E-Mobility Forum in Dakar, 2024
Initiate

**E-bajajs**
- Dar es Salaam: Auto Truck/DIT; SESCOM; TRI Ekoglobe (4 companies): 39 new E3Ws and 4 retrofitted
- One replication case

**E-motos**
- Kigali: Ampersand: 24 e-motos driven by women
- Three replication cases in Kenya, Uganda, Sierra Leone

**E-bicycles**
- Dar es Salaam: Africrooze: 16 pedal-assist electric bicycles
- Kigali: Guraride
- One replication case in Togo

**E-buses**
- Kigali: BasiGo: 4 bus deployed to prepare the City E-Bus Master Plan

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**Seed funding**

**Technical assistance**

- Technical training
  - Vehicle assembly
  - Battery sizing and design
  - Charging strategies and options
  - Retrofitting process
  - Maintenance & repairs
  - Industrialisation strategy

- Incubator support
  - Business Model Canvas
  - Technical support on the operation of shared systems
  - Digitalisation Support
Findings

- **Essential to collect data on ICE patterns and preferences of transport operators** to ensure a customer-fitted product

- **Essential to adopt an iterative approach** that includes feedback from transport operators on the vehicle and charging

- **No one-size-fits-all**: battery swapping is adapted in some contexts, but not all

- **Essential discussions between government authorities and companies** to ensure policies are adapted to needs, implemented, and include all vehicles, e.g. electric bicycles

- **Need to create a full ecosystem** including asset companies and digital platforms to distribute risks

- **Needs to scale policy efforts** to avoid environmental risks, e.g. lead-acid batteries

- **Needs to scale technical skills** for maintenance, repairs, and further local value creation
Impact

Policy Advice Paper
Electric Vehicles Charging Infrastructure
Kigali Demonstration Action

Policy Advice Paper
Electric bicycles in Rwanda: Fiscal and regulatory framework

IMPROVING GENDER EQUALITY THROUGH ELECTRIC MOBILITY
AFRICAN ELECTRIC BICYCLES START-UP BOOKLET

Policies

- Assessment of barriers
- Electric mobility policies
- EV Charging Infrastructure
- City Roadmaps
- National Urban Mobility Policies and Investment Program
- Gender inclusion
- Electric bicycles
- End-of-life management of EV Batteries
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