



Pilot Project Concept
URBAN PATHWAYS
2019

RWANDA

PILOT

PROJECT

CONCEPT

**E-mobility for last-mile
connectivity in Kigali**



**Wuppertal
Institut**

UN HABITAT
FOR A BETTER URBAN FUTURE

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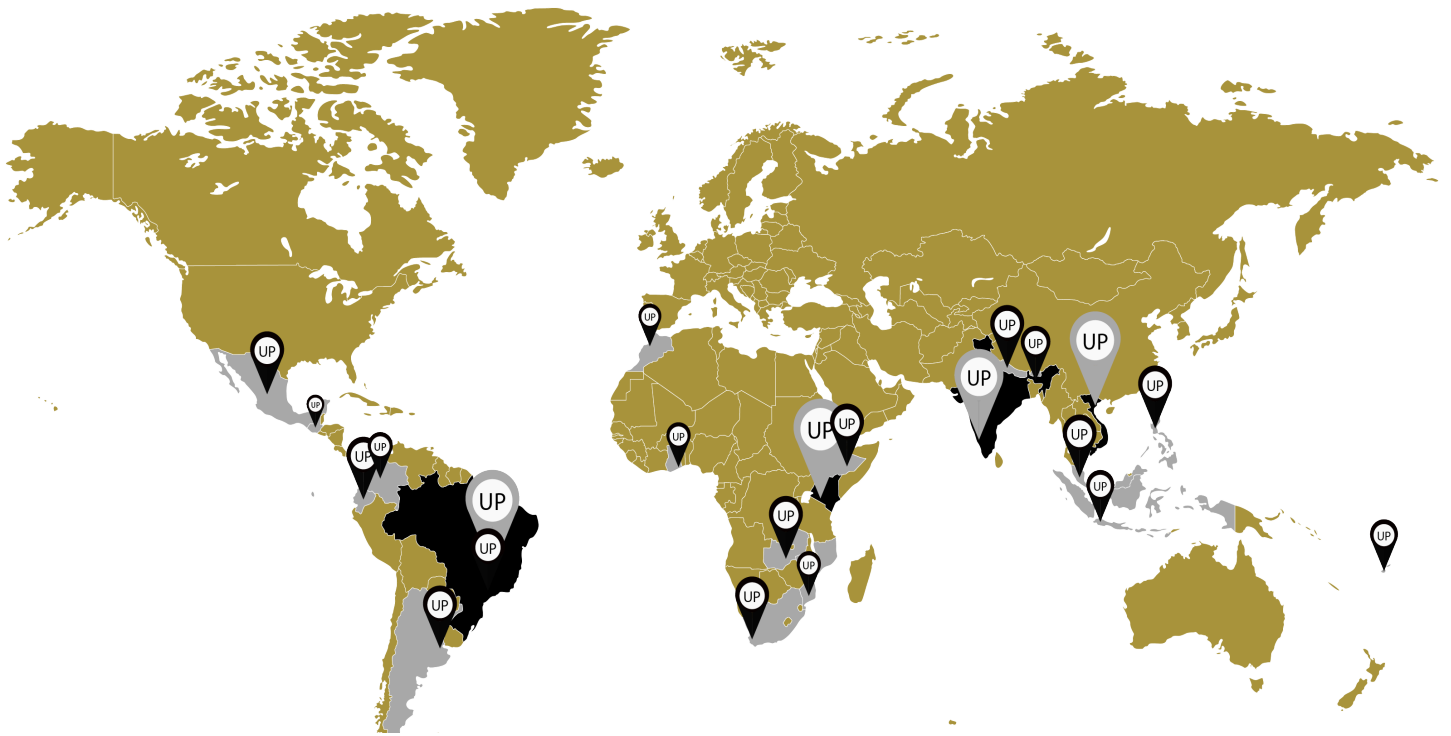


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URBAN PATHWAYS REPLICATION CITIES



KIGALI



COUNTRY OVERVIEW

POPULATION OF
1 million (2012)

KIGALI

OVERVIEW


Kigali, the capital of Rwanda, has a population of more than 1 million (2012). As the country's commercial and administrative hub, Kigali is rapidly urbanizing and the city's major economic sectors are challenged with issues ranging from congestion, pollution, deteriorating infrastructure, among others. Rwanda's CO₂ emission per capita is estimated at 0.074 in 2014; and in Kigali, the transport sector contributes about 52% of CO₂ emissions. The vehicle number is increasing in Rwanda; and by 2030, it is projected that the annual increase in vehicles will reach 16.5% from the current 12%, and light-duty vehicles will increase by 20%. The main form of public transportation throughout Rwanda and in Kigali is the minibus system, which runs both scheduled and unscheduled services according to a shared taxi system. With this background, Kigali has been implementing the "City Development Plan 2013-2018"; and as part of its goals, planned to become a city of green transport. The city is, therefore, making efforts to shift from small minibus services and private cars to buses; and in the long-term, provide only public transport services for city dwellers. As stipulated in its Development Plan, the city's transport priorities include improving the road network, reducing traffic congestion and integrating public transport system. It is expected that such priorities will stimulate concerted synergies aimed at implementing innovative transport actions and policies for building a sustainable transport system.

It is estimated that Rwanda's electricity mix is about 52% hydro and 48% thermal, with thermal power generated using imported diesel fuel. To increase its renewable share, the country has enacted laws and regulations including the 2018 Renewable Energy and Energy Efficiency Law which oversees renewable energy sources and energy efficiency.

Electricity mix:
about 52% hydro &
48% thermal

POLICY ENVIRON MENT

SUPPORTING ELECTRIC MOBILITY



Rwanda's INDCs identifies the transport sector as key to achieving climate change goals; as such, the country has set out to build an efficient and resilient transport system by promoting public transport, developing transport infrastructure and setting emission standards and regulations for vehicles within an integrated national transportation planning context. The country plans to construct a 17 km BRT with modern interchanges, install solar-powered streetlights, enforce vehicle fleet renewal and scrappage, and adopt low carbon technologies for new vehicles.

Within Rwanda's Vision 2020 framework, it is estimated that petroleum product consumption will increase by more than 10% per annum and will also increase emission. The country, therefore, envisages introducing a subsidy to encourage the use of clean vehicles and pilot Green Transport Fund to encourage the introduction of innovative transport technology among others. In this vein, Kigali plans to limit the use of private transport and increase patronage of public transport.

The existence of international and private local investors interested in developing Rwanda's transport sector is favourable to promoting electric mobility in Kigali. For instance, in response to the high cost of fuel and pollution, Kigali is promoting electric mobility by testing the use of electric motorbikes, known as e-moto. The aim is to provide a low cost and environmentally friendly mode of transport, mainly for motorcycle taxi riders. This initiative is being driven by private investors such as Ampersand which is an electric vehicle company with the mission to develop "mass-market shifts from petrol vehicles to direct, cheaper, better electric replacements". Also, the German carmaker Volkswagen is set to establish an assembly plant in Rwanda with first productions expected in early 2019. The company also has plans for the manufacturing of electric cars in the future. The presence of such an investor-friendly environment in Rwanda makes it favourable to develop electric mobility in the country.

In Kigali, the demonstration action will have a systemic approach integrating the BRT (planned), with the introduction of e-buses in combination with electrified feeder-services provided by 30 e-moto taxi (20 new and 10 remodelled) and 100 e-bikes (shared with Bosch components) that support first/last mile connectivity. With support from city authorities, transport operators and bus manufacturing companies, a business model for e-buses that will be suitable for the city's current bus transport administration will be explored. Expectedly, the project will create a good precursor to public transport electrification in Kigali. In partnership with local investors such as Ampersand, the demonstration project will introduce e-moto taxi in the city and support the installation of fast charging infrastructure at public places and vantage points, such as Charge Tank. The business model for e-moto taxi will also be developed in the demonstration project (Piaggio). Together with riders, transport associations and other relevant institutions, 10 existing motorcycles will also be remodelled into e-motorcycles – with the possibility to easily swap and charge batteries (Lithium-ion) and considering local-EU prototypes with Valeo 48V. The demonstration project will also test the establishment of an e-Bike sharing scheme along the most widely used bus corridors with charging points fitted with solar power energy to provide seamless charging service to riders and patrons. For the wider use of e-moto taxis and e-bikes, smart services (app) will be explored that support eco-routing (MaaS App).

DEMONSTRATION ACTIONS

- Feasibility study on the electrification with respect to vehicle specifications (range, speed), choice of the charging infrastructure location. Data collection using digital geo-localisation-devices of fuel-combustion vehicles for an ex-ante evaluation.
- Business case: E-Bus, E-motorcycle as taxi-services and E-Bike sharing in the city
- Provision of charging infrastructure including payment
- Ex-post evaluation: EV feasibility, charging infrastructure utilisation, emission reduction
- 20 E-moto taxis (new), 30 E-moto taxis (remodelled) and 30 E-Bikes are planned to operate in identified location

LOCAL, INDUSTRY, KNOWLEDGE AND IMPLEMENTATION

SUPPORT PARTNERS

The planned project activities will be coordinated and supported by Kigali City authority, in collaboration with the Ministries in charge of transport and energy sectors as well as transport regulatory institutions. The other key stakeholders include existing transport operators, service providers and associations including motorcycle taxi associations, bike rider groups and other relevant transport associations in Kigali. The stakeholders such as local private investors working in the transport and energy sectors, international and local vehicle manufacturers and suppliers will also be involved.





PROJECT TENTATIVE PLAN FOR DEMONSTRATION ACTION

Vehicle	Price per unit	Units	Total	Remarks
E-moto taxi (new)	16,000 €	20	320,000 €	Vehicle price is indicative, based on available market price (local and international), which might vary
E-moto taxi (remodeled)	1,500 €	30	45,000 €	
E-Bike	1,000 €	30	30,000 €	
App	5,000 €	1	5,000 €	
Charging station and infrastructure	100,000 €	1	100,000 €	Lump sum Contribution
Total			500,000 €	



PROJECT FINANCING & IMPLEMENTATION

The proposed demonstration project concept on 'E-mobility for last-mile connectivity in Kigali' was developed under Urban Pathways project and was submitted on 25 April 2019 as a part of EC H2020 proposal for funding. The technical support on project proposal development and activities, provided by "Urban Pathways" project, was funded by the International Climate Initiative and implemented by UN-Habitat, Wuppertal Institute and UN Environment.

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