



Project_Scoping
URBAN PATHWAYS
2018

GHANA

PROJECT

SCOPING

E-MOBILITY OPTIONS



**Wuppertal
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UN HABITAT
FOR A BETTER URBAN FUTURE

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URBAN PATHWAYS

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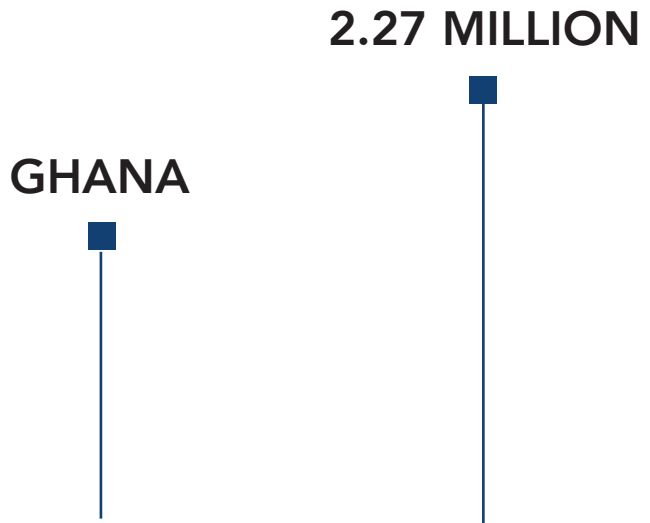
E-MOBILITY OPTIONS



URBAN PATHWAYS REPLICATION CITIES

PROJECT SCOPING SUMMARY

SUMMARY

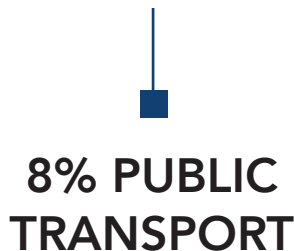


Accra is the capital of Ghana, a country located in the Western region of Sub-Saharan Africa. The population of the city as at 2014 was estimated at **2.27 million** people (World Population Review, 2018). With the population increasing at a rate of 4%, Accra is noted to be among the fastest urbanizing cities in Africa (Atlas of Urban Expansion, 2016).

- Population: 28,206,728 (2016)**
- Population Growth rate: 2.2% (2016)
- Share of Urban Population: 53.39% (2014)
- Urban Population Growth: 3.4% (2016)
- GDP: 42.69 Billion USD (2016)
- GDP Growth rate: 3.6% (2016)
- GDP Per Capita: 1707.70 USD (2016)
- Total Surface Area: 238,500 sq.km

TRANSPORT

It is estimated that Accra alone hosts about 50% of the total registered vehicles nationwide numbering about 1,134,599 vehicles by 2017 (EPA, 2017). In Accra, most trips are made by private cars, taxis, mini-buses (called trotro) and buses; the latter three constituting the core of public transport services in the city. In recent times, there is an increase in the use of motorcycles and bicycles as a means of transporting goods and people. The use of motorcycles popularly called **“Okada” constituted 8% of all modes of public transportation** as at the year 2015 and has gained popularity though it is considered illegal (Graphiconline, 2018).



URBAN



PATHWAYS



E-MOBILITY IN ACCRA AT A GLANCE

As posited by Leurent and Windisch (2011), electric mobility contributes to the reduction of CO₂ emission, especially when the electricity used is not generated from fossil fuels. Other benefits derived from electric mobility include its low noise levels hence calm traffic conditions and the general improvement in air quality. Kennedy, Miller, et al. (2005) indicated that about 75% of trips in urban regions are made by fossil-fueled vehicles; a trend, the author said is not consistent with global sustainability. Mainstreaming the use of electric vehicles in the transport sector of any city is therefore valuable for a sustainable urban development considering the fact that the transport sector plays a key role in the urbanisation process and is a major contributor to GHG emissions.

In developed countries where tremendous efforts have been made to promote electric mobility, the road and the rail sub-sectors have seen major boosts. Electric cars have remained the most dominant electric transport means with regard to electric mobility deployment. Electric cars include battery-electric (BEVs), plug-in hybrid electric (PHEVs), and fuel cell electric (FCEVs), the latter being the least diffused in terms of market penetration. Countries like Norway, Netherlands, Sweden and China hold the largest share of the global electric car market (Electric Vehicles Initiative, 2017). Other transport means that have seen

electrification include two-wheelers (bicycle and motorcycles), three-wheelers, buses and Low-speed electric vehicles (LSEVs).

Electric Vehicles Initiative (2017) indicated that the deployment of electric vehicles is largely facilitated by the policy environment which according to Marquis, Zhang, et al. (2013) involves the coordination of several actors such as: vehicle and battery manufacturers, providers of charging infrastructure, government institutions and consumers. Examples of policy support for electric vehicles include financial incentives, research on technological innovations, and other instruments which mostly aim at enhancing the deployment of electric cars and developing charging infrastructure.

Unlike the developed world, developing countries still lag in the deployment of electric mobility. Asmelash, E. (2018) argued that this situation is mainly due to the inadequate regulatory policies, lack of necessary support infrastructure and low electricity grid requirements. In the face of these challenges, cities in the developing world continue to wallow in poor transportation conditions with attendant negative environmental effects. Stepping up efforts to advance the electric vehicle market in developing countries will therefore be instrumental in achieving global climate change objectives.

BRIEF ON URBAN TRANSPORT IN ACCRA

There are four major types of transport available in cities around the world namely: rail, road, air and water. This study dwells mainly on road transport as it is the most developed type of transport in the developing world. For instance, in Ghana, the road transport sub-sector as at the year 2008 received about 99% of all government investments into the transport sector; and represented the most dominant carrier of more than 95% of all passenger and freight traffic (Government of Ghana, 2008). Consequently, the road transport sector accounts for 99.7% of the total gasoline consumption in the Ghanaian economy, a situation noted in the 2008 National Transport Policy as environmentally damaging to the population.

TRANSPORT MODES IN ACCRA

In Accra, most trips are made by private cars, taxis, mini-buses (called trotro) and buses; the latter three constituting the core of public transport services in the city. In recent times, there is an increase in the use of motorcycles and bicycles as a means of transporting goods and people. The use of motorcycles popularly called “Okada” constituted 8% of all modes of public transportation as at the year 2015 and has gained popularity though it is considered illegal (Graphiconline, 2018). The table3 shows the shares in the various of mode of transportation (both motorized and non-motorized) used in Accra as at 2008.



10% ■ Large buses

52% ■ Mini buses (troto)

9% ■ Taxis

**SHARE IN
TRANSPORT
MODES**

Private cars **13%** ■

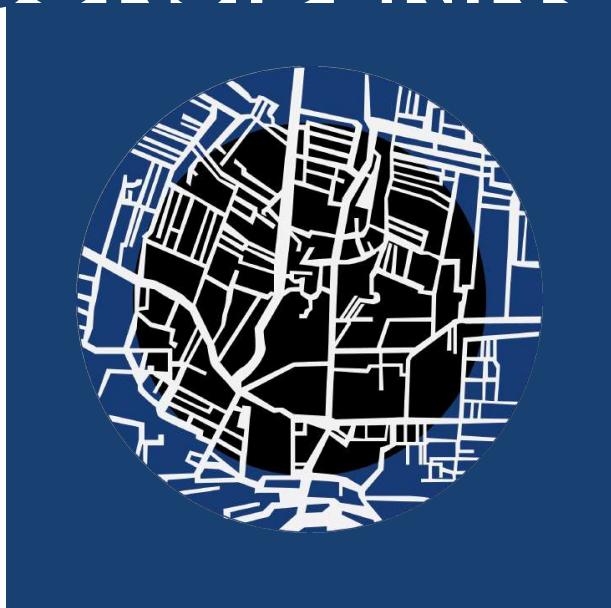
Walking **12%** ■

Others
(incl. bicycle) **4%** ■

Source: (Kumar and Barrett, 2008)

As shown above mini-buses provide the bulk of urban transport services in Accra. Compared with large buses whose average age is 1 to 2 years, mini-buses used in Accra age typically between 15 to 20 years (Kumar and Barrett, 2008). These mini-buses have over the years been described as over-aged and poorly maintained vehicles that pose safety and emissions threats to urban dwellers. The rise in the use of motorcycles as public transport after the year 2008, has been associated to passengers' desire for a quick means of movement to avoid being stuck in traffic congestion mainly caused by mini-buses and taxis. The use of bicycles in Accra is limited; owing to the fact that cycling lanes are non-existent on most roads; and where they are available, such spaces are encroached by businesses and hawkers (Kumar and Barrett, 2008). The non-availability of pedestrian lanes also discourages walking and rather makes it a risky means of movement (Quarshie, 2004).

CONSIDERING



E-MOBILITY IN ACCRA

Having a glimpse at the urban transport situation in Accra as illustrated above, it is evident that the urban public transport sub-sector (made up of mini-buses, large buses and taxis) provide the most means of movement of goods and people. One of the experts interviewed indicated that [...in the transportation mix of Accra, road transport is almost like more than 90%...so if they are doing anything in terms of electric mo-

bility, the option will be in road transport...]. In effect, a major intervention (such as introducing electric vehicles) in this area will generate immense environmental gains in the city's transport sector as a whole. As far as this sub-sector is concerned, however, there is currently no available information on any initiative to electrify mini-buses, large buses or taxis. This was confirmed by both experts; one of whom affirmed that [...As far as our National Policy on Transport is concerned, there is no direct policy action on electric vehicle; the policy though emphasizes mass transport...].

As far as our National Policy on Transport is concerned, there is no direct policy action on electric vehicle; the policy though emphasizes mass transport



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Considering the fact that mini-buses remain the most preferred mode of public transport in Accra, this study suggests that an option to provide electric mini-buses can remarkably contribute to the reduction of CO₂ emissions in the city. Though previous studies on the urban transport sector of Accra showed that significant efforts have been made by government and other stakeholders to sanitise the operations of mini-buses (mostly owned by transport unions and individuals) and introduce Bus Rapid Transit, the sector remains largely unregulated. An attempt to introduce electrification must therefore be guided by these developments. Again, opting for electrification of buses in Accra, it will contribute enormously to efforts by urban transport actors in the promotion of environmentally sustainable transport modes as set out in the Ghana Urban Transport Project (GUTP) started in 2007 which aimed at lowering transport related Greenhouse Gas (GHG) emissions in the city (World Bank, 2007). When asked about which mass transport mode that should be considered in the electrification of transport in Accra, both experts mentioned the QBS under operation in

Accra. One of them said [...Oh! It's going to be the Quality Bus Service, ...because in terms of governance and structure, it will be the easiest arena to intervene...it will cut cost, reduce emissions...]. Currently, the project is running a pilot Quality Bus Service on one of the two proposed corridors in Accra with 45 buses operating on fossil fuel. Introducing electric buses in the context of this project may be feasible but could only be implementable if the general policy environment is supportive of the deployment of electric mobility in Accra.

With regards to taxis as a means of public transportation, same can be said that a supportive electrification programme targeted at taxi operations in Accra will boost environmental benefits. A current development, which is of interest to this research is the introduction of Uber Services in Accra. Since the commencement of its operations in June 2016, Uber has complemented the regular taxi services and has since gained grounds as an affordable, reliable and more safer choice in the taxi business in Accra (Enemchukwu, N., 2017). Considering that there are strict requirements for the type of vehicles used for Uber services, a collaborative policy targeted at electrification of Uber services in Accra will not only be a groundbreaking innovation but also an initiative to minimize the emissions from the taxi service sector in Accra.

Whilst the rate of car registration in Ghana continue to rise, ranging from 3% to 24% annually, the use of pri-

vate cars in Accra keep soaring with growing concern for the environment (Ghana Statistical Service, 2008). However, promoting electric car ownership for private use can have implications for traffic congestion particularly in Accra where there is high desirability for electric cars as revealed in a recent study conducted in Accra by Hamidu (2017) which showed that 76% of respondents indicated that they were willing to use an EV if available in the Ghanaian market. Policy development to deploy electric cars must therefore take account of this phenomenon.

As already indicated above, the use of two wheelers (bicycles and motorcycles) in Accra is not encouraging mainly due to the inadequacy of cycling infrastructure. As such these modes of transport remain underdeveloped and have received little interventions over the years. Though there is growing use of motorcycles as public transport, the venture according to existing transport policies and regulations remains illegal. An attempt to introduce electrification in this area can therefore be hampered by its illegitimacy.

In a nutshell, it can be said that the various modes of transport, as exist in Accra, present varying levels of potential in terms of electrification of the city's transport sector for that matter, electric mobility.

E-MOB ILITY

Electrification of buses for the passenger transport sector in Accra presents the highest possibilities. Specifically, the deployment of electric buses for the QBS in Accra as revealed in this study shows greater feasibility. As the Government of Ghana's resolve to promote sustainable mass transportation forms part of the country's Nationally Determined Contributions as presented to the United Nations Framework Convention on Climate Change (UNFCCC) in fulfilment of its obligations under the Convention (Government

of Ghana, 2015a); an effort to promote electric mass transportation in Accra will therefore fit into Ghana's contribution to the global agenda on low carbon urban development. Nevertheless, some foreseeable challenges as revealed in this study include the unreliability of energy supply in Accra. The following excerpts from the interviews summarize these challenges:

We (as a nation) are already having problem with stability with electricity, our energy reliability is an issue, ...so to add electric vehicle is a challenge

...the adaptability of the technology is a problem, ...it's not easy for people to assimilate and accept new technology, ...

As opined by the Experts interviewed, there should be a roadmap focusing on electric mobility in Accra and Ghana as a country. Some of these recommendations are captured in the following quotes:

...We should have massive education on electric transportation, try and situate the concept within our policy at the Ministry level, and convince all key stakeholders so it can transcend to the people ...

EV

READINESS

CONCLUSION

As set out in this study to assess the electric mobility options for the city of Accra, this research showed that opting to deploy electric buses in Accra can derive the most environmental benefits for city dwellers in Accra. This can be achieved when there is a shift from the use of private cars, mini-buses (trotros) and taxis to mass public transport such as the Quality Bus System being run in Accra. Since the buses currently operate on fossil fuel, introducing electric buses in the QBS can therefore generate greater positive impacts in the bid to reduce greenhouse gas emissions in the city's transport sector. A readiness assessment of this electrification

option as presented in this study suggests that though there are barriers to the deployment of electric mobility in Ghana such as absence of charging infrastructure and unreliability of electricity, the general policy environment is supportive of the development of sustainable mass transportation. The policy environment can be capitalized to attract investments into charging infrastructure installation, development of off-grid renewable energy source for charging, and procurement and deployment of electric buses for the operations of the QBS. The realization of this electrification agenda in Accra can be instrumental in achieving the country's emissions abatement goal for the urban transport sector in Ghana.



POLICIES & STAKEHOLDER MAPPING

Ghana's political governance is grounded in its decentralization policy where national, regional and local government structures play variety of roles in the planning, formulation and implementation of programmes, projects and activities to better the lives of citizens. The governance policy in Ghana emphasizes on participatory and consultative approach to development. In this regard, the Local Government Act 462 of 1993 amended by the Local Government Act 936 of 2016 makes legal and regulatory provisions for a participatory and con-



sultative process in decision-making at the local level. By this arrangement, national Ministries, Departments and Agencies (MDAs) exist to formulate sector-level policies and guidelines to direct the economic drive of the country; whilst Metropolitan, Municipal and District Assemblies (MMDAs) acting under these policy guidelines deliver concrete programmes, projects and actions at the grassroots level. There are currently 254 MMDAs in Ghana whose activities are monitored and evaluated by the Regional Coordinating Councils represented in all 10 administrative regions in Ghana.

MMDAs also have deliberative, legislative and executive functions; and are the planning authorities with the responsibility for the total development of areas under their respective jurisdictions. Despite this comprehensive decentralisation system, the implementation of some sectors' activities continues to be at the purview of national institutions. For instance, the energy sector roles ranging from energy production, transmission, distribution and management have been largely played by MDAs. The execution of transport and waste sector projects however mostly remain under the control of MMDAs. As Ghana is faced with the challenges of limited budget resources and inadequate capacity to fully provide all infrastructure and services need of the population, the country has liberalised public infrastructure development and service delivery with the aim of leveraging public assets with private sector resources to adequately provide for the populace. In this regard, a comprehensive Public-Private Partnership (PPP) Policy has been formulated in 2011 to set the framework for private sector participation in the delivery of public needs.



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