Shifting to Efficient and Zero Emissions Vehicles in The Global South

CHALLENGES AND OPPORTUNITIES TO ZERO EMISSION VEHICLES

Jelani Aliyu, MFR, DG/CEO NADDC, NATIONAL AUTOMOTIVE DESIGN AND DEVELOPMENT COUNCIL, NIGERIA
The National Automotive Design and Development Council is committed to the promotion of Renewable Energy Powered Vehicles and has started the following programs and initiatives.

1. **Electric Vehicle Policy Development.** Technical Committee working to create legal framework for the promotion of the adoption, production, patronage and usage of EVs in Nigeria.

2. **Promotion and support of stakeholder production of EVs,** which has led to the beginning of local Assembly of the Hyundai Kona EV by Hyundai Nigeria, and the deployment of the Jet Mover Electric Van by Jet Systems Nigeria. Max e has developed an Electric Motorcycle.

3. **NADDC direct Research and Development** into Nigeria and Africa applicable EVs.

4. **Development of Charging Infrastructure:** Pilot Solar Powered EV Charging Stations have been developed and commissioned to provide platform for nationwide replication by private sector.

5. **Collaboration with academia and research institutions** (both local and international): the Pilot Solar EV Charging Stations are located at universities to additionally provide effective platforms for further Research and Development. Collaboration also going on with University of Nigeria, Nsukka on Solar Powered Agricultural Solutions.
Promotion and support of stakeholder production of EVs, which has led to the beginning of local Assembly of the Hyundai Kona EV by Hyundai Nigeria, and the deployment of the Jet Mover Electric Van by Jet Systems Nigeria. Max e has developed an Electric Motorcycle.
Promotion and support of stakeholder production of EVs, which has led to the beginning of local Assembly of the Hyundai Kona EV by Hyundai Nigeria, and the deployment of the Jet Mover Electric by Jet Systems Nigeria. MAX E has developed an Electric Motorcycle. Phoenix has developed an e-Mini Bus.
NIGERIA HAS TWO OPTIONS

1) VEHICLE ELECTRIFICATION

2) AUTOGAS POWERED VEHICLES

Development of 100% Solar Electric Vehicle Charging Stations

Jelani Aliyu, MFR, DG, NADDC
Development of Charging Infrastructure:
The Council has developed and started the implementation of the ‘100% Solar Powered Electric Vehicles Charging Station Project’. It has built and commissioned the first stations in Sokoto, April 8th and in Lagos, 2021July 13th, 2021, and, and the third one coming up in Enugu 1st Quarter 2022.
CHALLENGES AND OPPORTUNITIES TO ZERO EMISSION VEHICLES

CHALLENGES:

- POWER
- AFFORDABILITY
- EXTREME ENVIRONMENTS
- GLOBAL POLICIES
- SOURCING OF RAW MATERIALS
CHALLENGES:

POWER - just over 40% of Africans have access to electricity

AFFORDABILITY - economies continue to grow, but purchasing power is relatively very low for 50% of the population

EXTREME ENVIRONMENTS - temperatures of over 50 degrees Celsius, extreme dust, rainfall
CHALLENGES:

GLOBAL POLICIES - as countries across the world set targets on banning fossil fuels, what are the export and trade impacts on Africa?

RAW MATERIAL SUPPLY - what are the effects of sourcing raw materials that go into EV and battery production

END OF SERVICE DISPOSAL – when critical mass is reached of Evs in Africa, what are the recycling plans
CHALLENGES AND OPPURTUNITIES TO ZERO EMISSION VEHICLES

THEREIN LIE THE OPPURTUNITIES:

POWER - sustainable energy – mini grid solar solutions (pilots)

1. NADDC Pilot 100% Solar Powered EV Charging Stations
   Sited at three universities, Usmanu Dan Fodio, Sokoto, University of Lagos, University of Nigeria, Nsukka
   SOCIAL and ECONOMIC POTENTIAL: Campus Transportation and Logistics

2. NADDC/UNDP Collaboration on Charging Stations – Discussions with UNDP Nigeria office on setting up EV Charging Station for the organization and produce blueprint for scalability.
   SOCIAL and ECONOMIC POTENTIAL: Effective contribution to supporting projects on sustainable economic growth and human development in Nigeria, and Africa

3. GIZ/EU Supported Solar Mini Grid Project - Gbamu Gbamu Community
   SOCIAL and ECONOMIC POTENTIAL: Replicable as a Business Model in rural communities to effectively transform the already established cultural, social and economic transportation activities.
AFFORDABILITY - strategic R&D – innovative product access, ownership and financing models

1. **Strategic R&D** – Innovative design and development for applicable cost effective manufacturing, maintenance and recyclable componentry: integrating local materials, systems and labour, shortened value chain logistics. Emphasis on offroad rural Evs.

**SOCIAL and ECONOMIC POTENTIAL:** Highly affordable/attainable products, vitalization of local economy through local material sourcing and provision of local labour. Effective transfer of technology and expedited upgrading of relevant skill sets. All leading to enhanced purchasing power and ensuring attainability of vehicles.
THEREIN LIE THE OPPURTUNITIES:

AFFORDABILITY

- strategic R&D – innovative product access, ownership and financing models

2. Innovative Product and Power Access, Ownership and Financial Models – intelligent programs to allow access and use of vehicles through Community Ownership, Affordable Leasing Plans, Low to Zero to Negative Government Subsidized Financing. Innovative sustainable energy provision for cost effective access to battery charging and swapping.

SOCIAL and ECONOMIC POTENTIAL: Access and attainability to relevant EVs by majority of society, opportunities in financially viable business models in providing charging and battery swapping services.

EXAMPLES:

I. Nigerian Electric Bike company, Max e provided leasing services with its zero emission two wheelers in the GIZ/EU funded Gbamu Gbamu Mini Grid Pilot Program.

II. Nigerian EV company, Phoenix Renewables, converts petrol mini-buses to Electric and offers cheaper commercial transportation services.
CHALLENGES AND OPPORTUNITIES TO ZERO EMISSION VEHICLES

THEREIN LIE THE OPPORTUNITIES:

AFFORDABILITY - strategic R&D – innovative product access, ownership and financing models

3. NADDC Solar Powered Agricultural Tractor development in collaboration with University of Nigeria, Nsukka.
   SOCIAL AND ECONOMIC POTENTIAL: to develop an open source solution of a cost-effective sustainable tractor for small rural farmers. Trained fabricators and investors will be free to replicate and lease out, sell, or self use.

4. Collaboration with Global OEMs on Local Production of e-tractors
   NADDC engagements at the Electric Vehicle Innovation Summit, Abu Dhabi, 2022, for partnerships
   SOCIAL AND ECONOMIC POTENTIAL: provide more powerful sustainable zero emission tractors for intensive farming and effective V2X, Vehicle-to-everything charging solutions
EXTREME ENVIRONMENTS

1. **Strategic R&D** – highly creative design and engineering development to achieve Evs that are durable, rugged and compatible with the extreme climatic and geographical conditions of Africa.

**SOCIAL and ECONOMIC POTENTIAL:**

- Development of Evs that will last and offer uncompromised service in the many different conditions of the continent.
- Promotion of innovation and the empowerment of local design and engineering talent
- The above would expand to bases for global OEMs for Extreme Terrain R&D and Product Testing
STRONGER ACCORDS/ENFORCEMENT:

GLOBAL POLICIES – All countries that have set EV Targets need to institute corresponding bans on the export of fossil fueled powered vehicles to Africa and the Global South

RAW MATERIAL SUPPLY - Strong global enforcement of all relevant regulations on mining relevant e-mobility related raw materials

END OF SERVICE DISPOSAL – Strict enforcement and compliance with all local and applicable global recycling regulations
We must imagine a future of unbelievable accomplishments, a future where every man, woman and child is empowered to lead a happy and successful life.

That future must be achieved through ubiquitous and sustainable industrialization, enabled by intelligent electric mobility to every relevant nook and corner of Africa.

Jelani Aliyu, MFR, DG/CEO
NATIONAL AUTOMOTIVE DESIGN AND DEVELOPMENT COUNCIL, NIGERIA