

ELECTRIC VEHICLES: NEW ERA FOR NIGERIA

On the 5th of February, 2021 remarkable history was made, when the Honourable Minister of Industry, Trade and Investment, Otunba Adeniyi Adebayo, unveiled the first Nigerian Assembled Electric Vehicle in Abuja.

Two months later, on April 8th, 2021, incredible history was again made when the National Automotive Design and Development Council commissioned Nigeria's first Solar Powered EV Charging Station in Sokoto.

With these two bold events, Nigeria courageously joined the league of nations committed to the Electric Car Revolution, committed to protecting the environment and ensuring a cleaner and more sustainable future.

The NADDCC is excited and honoured to be championing and pioneering these developments: simply put, the Council is not just promoting the local production of traditional automobiles, but we are seriously committed to the adoption and production of highly advanced technological transportation solutions.

The above mentioned two developments are part of this quest, which overall consist of the following initiatives and programs:

- a) Electric Vehicle Policy Development.
- b) NADDCC direct Research and Development.
- c) Promotion and support of stakeholder production.
- d) Development of Charging Infrastructure.
- e) Collaboration with academia and research institutions (both local and international).

a) Electric Vehicle Policy Development

Legal Framework to promote Vehicle Electrification in Nigeria is being developed as an integral part of the general National Automotive Industry Development Plan (NAIDP) review. It will offer fiscal incentives and booster initiatives to support production and usage of EVs in Nigeria: The fiscal incentives will be time bound to allow proper establishment of the technology and yet spur development: import duty/levy incentives would give way/transition to incentives for localization of componentry. Subsidies and tax waivers would apply to both manufacturers and end users of Evs.

b) NADDCC direct Research and Development

The Council has designed and is currently undergoing the engineering development of a cost-effective compact Electric Vehicle. It is strategized to be an attainable vehicle intune with our culture, climate, terrain and economic structure. NADDCC is working towards a fully functional prototype and proof of concept which would then be licensed out to the private sector for mass local production.

c) Promotion and Support of Local Stakeholder Production.

As per the Council's mandate of promoting local production and its strategized efforts, local automotive stakeholders have invested in Electric Vehicles:

- i. As has shown, Hyundai Nigeria has started local assembly of the Kona Electric Vehicle. It was unveiled on February 5th, 2021 by Honourable the Honourable Minister of Industry, Trade and Investment. It is a 100% EV that has a range of 482 kilometres when fully charged.
- ii. New Indigenous automotive company, OMAA, subsidiary of Kojo Motors, is developing its own version of a 100% Electric Mini-bus. It would be produced in Nigeria.

d) Development of Charging Infrastructure:

The Council has launched the '**Solar Powered Electric Vehicles Charging Station Pilot Project**'. It has built and commissioned the first station in Sokoto, April 8th, 2021. The second one the second is slated for commissioning in Lagos before end of 2nd quarter, 2021. And a third one coming up in Enugu 3rd quarter, 2021.

These are 100% Solar Powered to provide pure clean energy for Electric Vehicles. This will enable applicable Research and Development to develop blueprints for nationwide scaling as viable businesses by the private sector.

The Council is strategizing and has started discussions with the Department of Renewable Energy of the Federal Ministry of Power on a collaboration to create Pilot Electric Vehicle Ecosystems that would provide both the necessary electric power and the effective Electric Vehicles for a comprehensive Zero Emissions Transportation Solution.

e) Technology Transfer and Collaboration with Universities.

- i. The above mentioned Solar Powered Charging Stations are situated in three Universities, 1), Usman DanFodio University, Sokoto, 2) University of Lagos, 3) University of Nigeria, Nsukka, each of the schools has an Energy Research Centre. This enables the projects to be effective platforms for Technology Transfer and advanced Research and Development into Vehicle Electrification. A team made up of staff from the NADDC, Universities, Power Authorities and EV Manufacturers shall continue with Monitoring and Evaluation of the whole system under various climatic and usage conditions:
 - a) Solar Power System – panels, battery bank, inverters
 - b) Vehicle Charging System

c) The Electric Vehicle – range, battery performance,

The objective is to intelligently engage academia so as to come up with more effective Vehicle Electrification solutions for Nigeria and Africa. The empirical data collected will also support further development of the Electric Vehicle Policy.

An argument that we always hear and we counter is “Why are we promoting Electric Vehicles in the country if we continue to have challenges with Electric Power Supply.” We hear points of view asking “if we currently cannot effectively power our homes, offices, schools and farms, how do we think we can power our transportation system with electricity?”

Our counter argument is both simple and straightforward: first, we must not be defined by our current challenges, because we are bigger than them, we must be defined by our dreams and aspirations and by what we can achieve. With that mindset, instead of giving up, we search for solutions, we search for answers to the challenges in electric power generation. We study our environment to identify and understand the resources that are easily available and can be effectively utilized to achieve results.

That study leads us to Renewable Energy and in particular Solar Energy, which is an abundant resource in Nigeria, the average solar insolation here is about 5.25kWh/m². And it could be as high as 7.0kWh/m² in the country’s northern region such as Sokoto. Solar Energy is a very clean and renewable energy source, it is one which continuously advancing technology is making more and more easy to harness and be stored for powering a multitude of electrified transportation vehicles and solutions.

Solar Energy and Transportation in Nigeria are a perfect match, it is a strategy that must be adopted and harnessed to create environmentally friendly solutions for moving people and goods across the nation, at the same time allowing us to maintain the purity of our environment.

That is why our EV Pilot Programs at Usman Dan Fodio University, University of Lagos and University of Nigeria, Nsukka are Solar Powered. We hope that it will pioneer the study and research into Solar Powered Transportation Solutions for Applicability in Nigeria and Africa in general.

Solar Power can be used as a direct energy source through onboard photovoltaic cells that are attached to the moving vehicle, or indirectly through fixed photovoltaic cells at charging stations.

We are committed to a landscape where homes across the nation would have Solar Powered Electric Vehicle Charging Stations. These stations would capture energy from the sun during the day and directly charge vehicles or store the energy in batteries for overnight charging. This would simplify the vehicle ownership and energizing experience. A set up such as this would also add significant value at offices, schools and businesses.

Solar Energy Powered Electric Vehicle Charging Stations would soon be the new normal, as the nation's usage of EVs grows exponentially. These would offer new opportunities for entrepreneurs as viable businesses offering unprecedented and yet increasingly necessary services to owners of zero-emission vehicles.

Solar Power technologies are a perfect opportunity for cities and municipalities in the country to leverage in providing clean, environmentally friendly and effective public transportation. Buses have the added advantage of having a large surface area on the roof to accommodate a big number of photovoltaic panels. These buses would be smooth, quiet and in turn offer a more relaxed environment for passengers who are either getting ready for work, or need to relax on their way their way back home after a hard day's work. In any case, this would add up to a more focused and productive workforce.

Our big Nigerian cities, Abuja, Lagos, Kano, Enugu, Port Harcourt and others could benefit tremendously from Solar Powered Busses, and we, the NADDC, are ready to partner with any of these cities in developing Solar Electric Bus Public Transportation Systems for their advancements.

With the exponential advancement of ever more new technologies in the transportation sector, road networks are becoming increasingly more embedded with Artificial Intelligence and Connectivity. These systems, especially in a place like Nigeria with high solar radiation can easily be powered sustainably with Solar Energy, ensuring a more durable, safer, less expensive and maintenance free operation.

The psyche that we as Nigerians must develop is one of superior technology adoption, promotion and development. This would allow us to identify and leverage solutions that would have earlier been seen impossible.

WHAT ARE THE ADVANTAGES OF AN ELECTRIC VEHICLE OVER A NORMAL FOSSIL FUEL POWERED ONE?

With a petrol engine, over 75% of energy could be wasted as directly generated heat in the cylinders, in fighting friction and in pumping air into the engine, in such a situation only about 25% of energy is used for motion and other useful energy utilization.: that is why those types of engines get very hot. In contrast, an electric engine/motor is incredibly efficient as it translates over 95% of energy input into motion/useful energy utilization.

Additional facts and advantages of EV are:

1. Nigeria is one of the 197 countries that are signatories to the 2016 Paris Accord which mitigates greenhouse gas emissions: the reduction of harmful emissions

such as carbon dioxide, carbon monoxide and methane which contribute to global warming and its negative effects.

2. EVs will allow us to meet those targets and provide cleaner air/cleaner environments for our people.
3. Because of our culture of putting off maintenance, Evs are better for us as they have far less parts/components, meaning they require less maintenance and hence less can go wrong.
4. The limited number of components needed by Evs will allow Nigerian companies to more easily achieve higher percentages of local content.
5. Hopefully the Nigerian passion for cars world inspire us to develop innovative solutions in power generation for the Evs, and hence positively spill over to all other aspects of power needs in our lives.
6. We are blessed with very intelligent and innovative youth in the ICT sector, Evs with their embedded computerized systems will provide huge opportunity for those youth to be employed and productive.
7. Vehicle Electrification provides an opportunity for entrepreneurs and the private sector to profitably set up charging stations and infrastructure.

The vision of a comprehensive Electric Vehicle Ecosystem cannot be achieved without the concerted effort of the Automotive Media: to play their role in progressively promoting and campaigning for the adoption, usage and development of the technology. Automotive journalists have a passion for exciting technology embedded in vehicles and I urge that they leverage on that to help create an intelligent and sustainable narrative in the best interest of Nigeria.

While a Transition Fuel needs to be adopted, Nigeria must aggressively work towards an ultimate future of a Zero-Emission Transportation Sector, where a Vehicle Electrification Policy would be firmly in place to strategically promote and sustain the technology in the nation.

Achieving these targets will need the alignment of all relevant government and private sector stakeholders: to focus and protect the long term interest of the nation, aligning it with prevailing global directions for the betterment of the Nigerian people and humanity in general.

**Jelani Aliyu, MFR,
Director General/CEO NADDC**