

DRIVE ELECTRIC INITIATIVE



Background

Ghana has been blessed with several petroleum discoveries in recent times. Significant amounts of gas discoveries have also been made, either in association with oil as in the Jubilee and TEN fields or in pure gas fields as in the Offshore Cape Three Points (OCTP). With the current gas reserves and possible future discoveries, it is safe to project a future where fuel will not only be available but affordable to power the thermal power plants and generate electricity in excess of what is required. Our current installed capacity of over 4,600MW is significantly more than our current peak demand of about 2,700MW. At this current rate, Ghana will need to create demand within the system to take the excess supply of electricity. As part of the Energy Commission's mandate to recommend national policies for the development and utilisation of indigenous energy resources, the Commission in collaboration with the Ministry of Energy is embarking on the drive electric initiative to promote alternative and productive use of electricity -beyond our business-as-usual case of industrial, commercial and residential uses- to power vehicles on our roads as well as enable us meet our climate targets.

In addition to current oil and gas discoveries, the solar energy potential is enormous and can be harnessed to provide clean and sustainable energy for mobility. With our ambitious target of achieving our renewable energy commitment under the Paris Agreement, Ghana will not only be spearheading the drive for electric vehicles but leading Africa into clean and sustainable energy production and utilisation. The recent report of the Intergovernmental Panel on Climate Change (IPCC) makes it clear that the world has less than 10 years to switch to renewable energy to avoid catastrophic climate change. It is not so much a "lifestyle choice", but a necessity for survival for everyone to switch to Electric Vehicles (EVs) in the next few years and contribute to the reduction of global warming.

We are at a point where we need to project into the future and plan for alternative means of survival. The age of cable telephones moved to the age of fixed phones and now to an age of mobile smart phones and is most likely moving into another age. Some decades ago, the idea of thin hand-held tablets or panels pulling out crisp graphics and pictures was unimaginable as the huge television boxes ruled the era at the time. Today, not only is it impossible to go to a house and find a huge TV box but also laughable, yet the journey continues.

Why Electric Vehicles?

Climate and emissions concerns have brought the adoption of EVs to the forefront in recent times. The governments of some of the biggest automotive markets around the world have not only declared their intentions but have taken bold steps to embrace EVs to take dramatic steps to curb emissions. France and the United Kingdom (UK) are looking to ban the sale of gas and diesel-powered vehicles beginning 2023 and completely by 2040. Norway plans to ban all but electric car sales by 2025.¹ China, the largest auto market in the world has publicly started charting a plan for an all-out ban on vehicles powered by internal combustion engines. It is time for Ghana and Africa to follow suit and make plans towards embracing electric vehicles ourselves in order to harness our enormous solar energy potential productively to meet our climate emission targets while simultaneously providing clean and affordable means of transport.

In addition, the use of electric vehicles will boost electricity sales and drive demand high enough to meet or exceed current supply, paving the way for a sustainable energy sector. EVs are much more efficient means of using energy as they convert about 59%–62% of the electrical energy from the grid to motive power at the wheels compared to conventional gasoline vehicles which only convert about 17%–21% of the energy stored in gasoline to power at the wheels². The Drive Electric initiative will enable us to increase our electricity intake and as such increase the much needed demand we need to reduce or eliminate the payment of high capacity charges while meeting our climate targets.



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Studies have shown that it takes about three to ten minutes to fill up a petrol or diesel engine car at a filling station with enough fuel to travel about 300 miles, costing about \$35 in the USA. To travel 300 miles in a small EV passenger car would need three full charges of a typical 25kWh battery used to power these vehicles costing about \$2.50 per charge in the USA with electricity priced at \$0.10 per unit (kWh).

In Ghana, an average petrol driven car will require 10 litres of petrol to travel 100km in comparison to an electric vehicle which will require 18kWh of electricity to travel the same distance. At the rate of GHS5.20 per litre, the user of the petrol-powered vehicle will spend

¹ www.environmentalpollutioncenters.org

² www.fueleconomy.gov

GHS52.0 on fuel to travel 100km. The 2019 electricity tariff published by the PURC³ shows that one kWh of electricity costs GHS 1.3279 for non-residential facilities and GHS0.9349 for residential facilities. At this rate, an 18kWh full charge will cost GHS 23.90 for non-residential charge and 16.82 for residential charge hence saving the electric car user GHS 28.1 and GHS35.2 respectively as shown in the table below.

		Non-Residential Charge		Residential Charge	
	Distance 100km	price (GHS/kWh)	Total	price (GHS/kWh)	Total
Electric vehicle (Full Charge)	18	1.327935	23.90283	0.93492	16.8286
Petrol Driven Car (Litres)	10	5.2	52		52
EV Savings	-	-	28.09717	-	35.1714

The low energy cost is one of the attractions of owning an EV. To put this into perspective, the average daily energy consumption per household in Ghana is 2.8 kWh.⁴ This is the amount of energy an average household consumes daily. A full 18kWh charge as mentioned above will therefore require over six times the amount of energy for an average household. At this rate, the country will be able to consume most of the power from the grid hence creating enough demand to take the excess supply

What will the Drive Electric campaign offer Ghana?

1. Ghana's INDC intends to reduce GHG emissions by 15% from the projected Business as Usual (BAU) level of 73.95MtCO₂e⁵ by 2030. This target may not be achieved considering population growth and industrialisation, it therefore goes without saying that introducing electric vehicles on our streets will send across a strong message to the international community of our readiness to meet our climate targets.
2. The use of electric vehicles in the country will promote renewable energy and also contribute to reduction in pollution. As is already apparent, pollution in cities is killing people, affecting the physical and mental development of children and raising a case for the urgent need to change to EVs, walking, cycling, and electric mass transit. Most people with EVs use renewable energy for charging as EVs solve the problem of the need of battery storage linked to solar energy. The energy is charged into the battery during the day when there is sufficient generation and used at night therefore as the number of EVs increases, so might the provision of renewable energy.

³ http://www.purc.com.gh/purc/sites/default/files/purc_approved_2019-2020_electricity_tariffs.pdf

⁴ Annual national average consumption per household 1033kWh/HH (Energy Commission)

⁵ Million tonnes carbon dioxide equivalent

3. Ghana will be one of the first to set an example that West Africa and for that matter Africa can be a part of the success story of electric mobility.

Electric Vehicle Sales and Price

There are over 5 million electric vehicles in the world at the moment according to the International Energy Agency's (IEA) 2019 EV outlook. According to the IEA, the number of EVs increased by 63% from 2017 to approximately 5.2 million in 2018⁶. It further projects sales of these vehicles to hit 44 million by 2030 under the EV30@30 campaign.

Although some critics are quick to point to the current prices of electric vehicles compared to the lower costs of fossil fuel-powered vehicles as a reason to not patronize them, it is worth noting that while electric vehicles were more expensive than ordinary cars, their prices have plummeted in the past few years and are even projected to reduce further in the next few years to match those of similar non-electric vehicles given the projected future demand of these vehicles. From an average price of over \$75,000 in 2010, prices have dropped to 39,000 for a typical Tesla model 3, about 27,000 for a Toyota Prius Prime Plug-In Hybrid, about 23,000 for KIA Niro Hybrid, 27,000 for a Ford Fusions hybrid etc. and these prices will continue to drop even further. It therefore comes as no surprise that Bloomberg New Energy Finance and several other respected studies forecast the fall of EV prices more quickly than originally predicted.

Further to the above, Volvo has announced that by 2019, every single model that it sells will either be all-electric or a hybrid with battery packs up to 100kWh.⁷ China is pushing the most aggressive mandates for electric vehicle adoption. Given the size of the Chinese market, new mandates, and similar ones in California and Europe, it will pressure on every automaker to ramp up EV production schedules as well as drive prices down.



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In addition, Electric vehicles cost less than half as much to operate as their gasoline-powered counterparts, according to a study of fuel costs by the University of Michigan.

⁶ <https://www.iea.org/gevo2019/>

⁷ <https://electrek.co/2017/02/09/volvo-first-all-electric-vehicle-2019/>

Besides the fact that these vehicles will increase the level of diversity among our vehicles based on fuel type as we await LPG filling stations to be built, other advantages of using electric vehicles are that they are quite, cheap to run, convenient and with low depreciation.

Objectives and Expected Outcome

The main objective of the Drive Electric Campaign is to:

1. To introduce and promote the use of electric vehicles as alternative means of mobility in Ghana.
2. To create demand beyond the business as usual levels and enable the productive and sustainable utilisation of excess capacity and drive electricity demand and utilisation.
3. To have at least one hundred (100) electric vehicles and at least 10 public charging outlets in Ghana by 2020