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**On the Horizon:
Nigeria's Compressed Natural
Gas (CNG) Initiative and
the Road to a Million Cars**



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Introduction:

With over 208 trillion cubic feet of gas reserves and increasing attention to the reduction of global carbon footprint, Nigeria is desirous of utilising its enormous gas resources. The government earlier declared January 1, 2021, to December 31, 2030, as Nigeria's Decade of Gas. Also, at the recently concluded COP28, Nigeria restated its commitment to the sustainable growth of natural gas exploration and utilisation as part of its contributions to the global drive to reduce carbon emissions. One of the ways through which the government seeks to achieve this is by converting natural gas into compressed natural gas (CNG) for use as transportation fuel.

Overview of CNG and The Presidential CNG Initiative

CNG is a fuel derived by compressing natural gas to less than 1% of its original volume and storing it at high pressure in durable cylinders. As a vehicle fuel, CNG offers numerous advantages, emitting over 70% less greenhouse gas (GHG) than petrol or diesel, costing 41% less for a 10-kilometer journey. Additionally, CNG-powered vehicles produce less noise and offer a more secure energy supply compared to the traditional gasoline source (crude oil), which can be highly volatile and unpredictable.

The idea of using CNG for transportation in Nigeria was first proposed in 1997 by the Federal Government as part of initiatives to promote domestic use of natural gas. The proposal was to adopt CNG as an automotive fuel, but this was not implemented as planned. In June

2017, the approved National Gas Policy which replaced the Gas Master Plan (GMP) recognised CNG as one of the alternative markets and uses for gas and also identified the need for the development of CNG plants and natural gas vehicles. Following the approval of the gas policy, in 2020, the Government launched the National Gas Expansion Programme (NGEP) to promote alternative fuel usage in cars and to make CNG the fuel of choice for transportation.

At the launch of the NGEP, the government targeted the conversion of at least 1 million petrol-powered cars to CNG-powered vehicles by the end of 2021, but that was not achieved. With increasing diesel prices and the economic impact of subsidy removal on petrol, the current administration has launched a new CNG for transportation initiative known as the Presidential Compressed Natural Gas Initiative (P-CNGi), aimed at reducing transportation costs for the citizenry. Under the P-CNGi, the government targets launching one million CNG vehicles by 2027. Pursuant to this, the government promises to roll out initial 11,500 new CNG-powered vehicles in the short term (with emphasis placed on mass transit vehicles), provide 55,000 new CNG conversion kits, and establish 56 new CNG refuelling stations nationwide by April 2025.

Regulatory Sufficiency for CNG Utilisation:

The Petroleum Industry Act 2021 (PIA) provides a comprehensive regulatory and governance framework for natural gas utilisation in Nigeria, including when it is converted to CNG. Specifically, the PIA lists CNG activities as part of the midstream and downstream gas operations, which are under the regulatory

powers and governance of the Nigerian Midstream and Downstream Petroleum Regulatory Authority (the Authority). CNG value chain-related activities captured in the PIA include the construction and operation of natural gas transport or transmission pipelines, including related compressor stations, construction, and operations of facilities to compress, transport, and deliver CNG. Essentially, the PIA applies up to the point of delivery of the CNG to the end user, and the recently issued regulation by the Authority has provided for operational licenses and permits across the value chain from compression facility to the dispenser at the last mile.

Fiscal Incentives in Support of the CNG for Transportation Initiative:

To facilitate the implementation of the initiative, several incentives have been introduced by the government, as highlighted below.

VAT Waiver

In a recent circular, the government declared a waiver of VAT on CNG feed gas. The VAT waiver extends to CNG/LPG dual fuel vehicles, dedicated CNG vehicles, CNG equipment components, conversion, and installation services, including all equipment and infrastructure related to the expansion of CNG, and the Presidential CNG Initiative, including conversion kits. This is likewise in addition to Section 5 of the Customs and Excise Tariffs Act, which grants import duty waivers on the importation of all equipment related to CNG.

Tax-free Period

The PIA provides that companies engaged in trade or gas utilisation business (downstream operators) are entitled to benefit from incentives stipulated in

Section 39 of the Companies Income Tax Act (CITA), i.e., an initial 3-year tax-free period renewable for another 2 years (or a 35% investment allowance) and an accelerated capital allowance after the tax-free period, this is available for investment in CNG with up to 10 year tax holiday for investment in much needed pipeline for the initiative.

Term Loan Facility

There is also an existing National Gas Expansion Programme Framework, published by the CBN in 2020, providing, amongst others, a 250bn Naira (term loan) intervention facility to manufacturers, processors, wholesale distributors, SMEs, and retail distributors engaged in listed activities aimed at stimulating investment in the gas value chain. Part of the activities listed include the establishment of gas processing plants and small-scale petrochemical plants; the establishment of gas cylinder manufacturing plants; the establishment of CNG regasification modular systems; the establishment of autogas conversion kits or components manufacturing plants; and the establishment of CNG primary and secondary compression stations.

Challenges to the Implementation of the Initiative:

As earlier hinted, the idea of adopting CNG as a transportation fuel has been known in Nigeria since 1997. However, despite the regulatory backing and fiscal incentives, its implementation has been way below expectations. This is due to several observable challenges identified as follows:

a. High conversion cost:

The fiscal incentives are commendable. However, they are only applicable to CNG producers and plant operators. Part of the cost of CNG usage as vehicle fuel rests on the owners

of converted vehicles. Currently, the cost of the conversion ranges from N300,000.00 to N600,000.00. With the present economic realities, vehicle owners may find it challenging to expend such an amount to convert their vehicles, even when they are willing. Hence, there is a conversion funding challenge that needs to be addressed at the consumer level to achieve the needed CNG penetration.

b. Significant Currency Fluctuations:

At present, CNG conversion kits and accessories are mostly imported. The Naira's volatility in the foreign exchange market, due to the fluctuations in the exchange rates, poses serious risk to the investors whose profitability, operational costs, and investment decisions, would be significantly impacted. Thus, discouraging investments in the CNG market and upsetting the stability of the conversion cost.

c. Lack of Adequate Distribution

Infrastructure and Refuelling Stations:

The country's gas pipeline distribution network is grossly inadequate, thus limiting the supply of natural gas to CNG stations. Also, unlike petrol stations, CNG refuelling stations are few and not evenly distributed across the nation. Going by a recent World Bank report, the distribution infrastructure available for CNG in the near term is to the extent that conversion would substitute less than 10 percent of the PMS consumed presently.

d. Inadequate Domestic Gas Supply:

The PIA, the Nigerian Gas Pricing and Domestic Demands Regulation, 2023, and the Domestic Gas Delivery Obligation Regulations, 2022, impose domestic gas delivery obligation (DGDO) on natural gas producers to meet the

domestic gas demand requirement (DGDR) as determined by the Authority. However, despite its improvement over the years, the DGDO compliance rate remains below 65 percent. This, by implication, limits the amount of gas available for conversion to CNG, more so considering that there are other strategic sectors equally competing for gas supply.

e. Regulatory Limitation on Safety Issues:

The PIA regulates CNG utilisation up to the point of its delivery to the end user and does not provide for issues arising post-delivery. The process of utilising CNG as an alternative vehicle fuel goes beyond its delivery to the end user. There are attendant safety issues that need to be addressed regulatorily. For instance, there is a need to provide safety standards for the cylinders and a need for regular inspection of the vehicles after conversion. By virtue of the PIA's limited application on this, it is unclear which authority is empowered to address safety issues related to CNG usage as vehicle fuel, thus leaving a regulatory vacuum.

In our considered view, the following recommendations would go a long way toward addressing the challenges:

Recommendations:

1. The conversion cost burden should be reduced to encourage deep market penetration. To do this, the government can put in place a credit facility (cash grant) or soft loans at minimal interest rates with an extended repayment period to enable motorists to finance conversion. Egypt, for instance, has put in place a term loan facility (with 3% interest and a 7-10 year repayment duration) to help car owners convert their petrol-powered cars to natural gas-powered vehicles. Nigeria

could adopt the Egyptian model as well.

2. Investment should be made in developing the pipeline distribution across the country, and priority should be given to natural gas connections to CNG stations with existing finance like the Midstream and Downstream Gas Infrastructure Fund established by the PIA . Understandably, developing the pipeline infrastructure will take a reasonable amount of time. In the short and medium-term phases, alternative transportation options such as barge, rail, and/or road should be encouraged. These are capital-intensive endeavours. Hence, the government should be available to provide the needed financial support to private investors willing to invest in such endeavours. For a start, the government should ensure that the N250bn NGEP (term loan) intervention facility is easily accessible not only to willing investors but also to the right ones with the capacity and track record to deliver. Thorough due diligence and compliance checks should be carried out by the government before disbursing such loans. To further encourage investments in CNG refuelling and service stations across the country, the government should consider lowering the fees for permits for CNG stations.

3. To mitigate the currency fluctuation risk for import of CNG conversion kits and accessories, government should guarantee the provision of foreign exchange at a reasonable rate using a percentage of savings from the petrol subsidy removal to hedge against fluctuations in order to give investors comfort and ensure stability of the conversion cost.

4. A carbon credit system may be introduced to encourage the use of CNG. Under this system, incentives are provided to

emitters of less Co₂. Earlier this year, Nigeria's National Council on Climate Change indicated that it may formulate a national carbon tax policy plan. It is hoped that this will be realised in no distant time. Under this system, producers of CNG will be able to earn more tax credits, tradeable with fossil fuel producers. This would encourage more entities to patronise CNG utilisation as a business. Interestingly, the carbon credit system is a global market where carbon credits can be traded across countries. Hence, CNG on a carbon credit market would allow companies in Nigeria to earn more income from engaging in CNG utilisation.

5. To ensure increased compliance by gas producers with their DGDOs, there should be improved and regular monitoring of producers' performances by the regulators. Also, the government should ensure the full implementation of the relaunched Nigerian Gas Flare Commercialisation Programme (NGFCP) as an avenue to make more gas available locally for CNG utilisation and other strategic purposes. In the long term, the eventual introduction of the willing buyer, willing seller regime with unregulated pricing will encourage gas producers to commit more of their gas supplies to the domestic market as they would freely determine their price at the prevailing commercial rate as against the current regulated pricing for supplies under the DGDOs.

6. Clear and specific Nigeria regulatory framework which addresses safety issues arising from CNG usage in vehicles will be required. In the United States of America, for instance, the National Highway Traffic Safety Administration (NHTSA), under the Department of Transportation (DOT), regulates the safety of CNG installations pursuant to the Federal Motor Vehicle Safety Standards (FMVSS) No.

304 by ensuring the periodic inspection of CNG cylinders installed on vehicles. There are also regulations at the state level. An example is the Regulations for Compressed Natural Gas (CNG), published by the Railway Commission of Texas. If the same is replicated in Nigeria, people's confidence would be bolstered regarding the safety of the vehicles post-conversion, and hence, there would be increased patronage.

Conclusion

It is evident that the adoption of CNG as an alternative fuel source aligns with global trends, promotes energy diversification,

and supports the local utilisation of a nation's gas resources. In the case of Nigeria, there is great potential to develop the CNG market as a viable alternative vehicle fuel. However, for it to successfully realise its CNG for transportation ambition and attain the targeted one million threshold of CNG vehicles by 2027, conscious efforts (some of which are outlined in our recommendations above) must be made by the government and other relevant stakeholders in that direction.

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End Notes

¹Mkpoikana Udoma, 'Nigeria's gas reserves hit 208 trillion cubic feet,' *Sweet Crude Reports* (May 21, 2023) <<https://sweetcrudereports.com/nigerias-gas-reserves-hit-208-trillion-cubic-feet/>> accessed 8 January 2024

²United Nations Climate Change Conference that took place in Dubai, United Arab Emirates, from 30 November until 12 December 2023

³Charles Mba, '5 benefits of compressed natural gas as an alternative fuel for cars in Nigeria,' *Dataphyte* (April 30, 2021) <<https://www.dataphyte.com/latest-reports/extractive/5-benefits-of-compressed-natural-gas-as-an-alternative-fuel-for-cars-in-nigeria/>> accessed 2 January 2024. With the removal of the petrol subsidy, it is projected by the government that CNG cars could help Nigerians save over two-thirds of their transportation cost. Justice Okamgba, 'FG to launch one million CNG vehicles by 2027,' *Punch* (November 1, 2023), <<https://punchng.com/fg-to-launch-one-million-cng-vehicles-by-2027/>> accessed 2 January 2024.

⁴It is less combustible, reduces the risk of fire outbreaks, promotes car efficiency, reduces car maintenance costs, and extends the lifespan of a car.

⁵As of 2016, there were a meager 6,000 CNG vehicles in Nigeria out of over 11.7 million registered cars as of then. Olufemi O. Ogunlowo, Abigail L. Bristow, M. Sohail, *Developing compressed natural gas as an automotive fuel in Nigeria: Lessons from international markets*, *Energy Policy*, Volume 76, 2015, Pages 7-17, ISSN 0301-4215, <<https://doi.org/10.1016/j.enpol.2014.10.025>> accessed 3 January 2024.

⁶Charles Mba, *ibid*.

⁷The government has also promised 100 billion in interventions in the form of provision of 3,000 CNG buses. Amaka Anagor-Ewuzie, 'Transport owners write Tinubu over promised CNG buses,' *BusinessDay NG* (October 3, 2023), <<https://businessday.ng/transport/article/transport-owners-write-tinubu-over-promised-cng-buses/>> accessed 2 January 2024.

⁸See section 318 PIA.

⁹Midstream and Downstream Petroleum Operation Regulations 2023

¹⁰Dated 7th December 2023

¹¹Section 302 (6). In section 318, PIA, "midstream and downstream gas operations" are defined to include transport and delivery of CNG.

¹²Adekunle Agbetiloye, 'Nigeria sets N300,000 to N600,000 cost for petrol to CNG vehicle conversion,' *Business Insider Africa* (November 14, 2023) <<https://independent.ng/cng-comes-to-fore-amid-controversies-over-removal-of-fuel-subsidy/>> accessed 8 January 2024

¹³World Bank Group, 'Time for Business Unusual,' *Nigeria Development Update* (November 2021), page 53 <<https://documents1.worldbank.org/curated/en/099545011232116970/pdf/P1778200813d1605e0b361074dc50d90cd3.pdf>> accessed 10 January 2024.

¹⁴According to the NMDPRA, 64.8 percent compliance rate was achieved between September 2021 to September 2022.

¹⁵Section 52(7) of the PIA established the fund for the purpose equity investments by Government in infrastructure related to midstream gas operations aimed at increasing the domestic consumption of Natural Gas in Nigeria and encouraging private investment. The major source of the fund is a 0.5% levy on the wholesale price of petroleum products sold in Nigeria, and natural gas produced and sold.

¹⁶Abdulkareem Mojeed, 'Climate Change: FG to unveil carbon tax system for Nigeria,' *Premium Times* (February 13, 2023) <<https://www.premiumtimesng.com/news/more-news/581752-climate-change-fg-to-unveil-carbon-tax-system-for-nigeria.html>> accessed 10 January 2024.

¹⁷Omono Okonkwo, 'Carbon Credit Revenues Cannot Replace Nigeria's Oil Revenues – Chinnan Maclean-Dikwal,' *Nairametrics* (09/08/2023) <<https://nairametrics.com/2023/09/08/carbon-credit-revenues-cannot-replace-nigerias-oil-revenues/>> accessed 9 January 2024

¹⁸This applies to the design, and installation of CNG engine fuel system on all (land) vehicles; CNG systems used for compression, storage, sale, transportation, delivery, or distribution of CNG for any purpose; and all CNG mobile fuel systems in Texas.