STRATEGIC SHIFT TO CLEAN ENERGY IN NIGERIA: LEVERAGING NATURAL GAS AS A TRANSITION FUEL TOWARDS A RENEWABLE ENERGY FUTURE

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In line with the Decade of Gas Initiative[1], Nigeria is committed to leveraging its huge natural gas resource (currently estimated at 208.83 trillion cubic feet)[2] to drive its energy transition. This is because natural gas emits lower carbon emissions when compared to petrol/gasoline although its methane emissions that are 84 times more potent that CO2[3], over a 20-year period, remain challenge as regards decarbonization of the sector. Nonetheless, the government is taking as active steps to reduce its methane emissions as presented in a report[4] published by Natural Resource Governance Institute.

Specifically, natural gas has lower CO2 emission capacity when burnt (117 CO2 per BTU) when compared to gasoline (157.2 CO2 per BTU) and diesel (161.3 CO2 per BTU). On this note, the Nigerian government has taken active steps to commercialize natural gas as evident in the government's Nigerian Gas Flare Commercialization Programme (NGFCP)[5]. Specifically, the NGFCP which was relaunched in 2022 is aimed at reducing gas flaring through sustainability gas utilization. Another of such initiative is the Presidential Compressed Natural Gas Initiative[6] (which is being currently implemented), that aims to drive adoption of compressed natural gas (CNG).

It is expected that commercialization of Nigeria's natural gas resources would enable energy access across the country through its use for power utilization (in gas-powered plants), as liquefied petroleum gas for cooking purposes, CNG for transportation and other non-power uses. In addition, considering that Nigeria has huge natural gas reserves, it is possible that the country can leverage this resource for its energy security. This can be achieved by exploring, producing, and utilizing this resource in a sustainable manner, thereby reducing the susceptibility of Nigeria's energy ecosystem to global volatilities of gas importation and its antecedent impact on the entire energy value chain.

[1] Decade of Gas Initiative, 13 January 2025, https://decadeofgas.com.ng/#decadeofgas
[2] NUPRC, 2023 Annual Report, 2023, https://www.nuprc.gov.ng/wp-content/uploads/2024/04/UPDATED-2023-NUPRC-ANNUAL-REPORT.pdf
[3] European Commission, Methane Emissions, https://energy.ec.europa.eu/topics/carbon-management-and-fossil-fuels/methane-emissions_en
[4] NRGI, Strengthening Methane Emissions Reduction in Nigeria's Oil and Gas Sector, July 2024, https://resourcegovernance.org/sites/default/files/2024-09/strengthening-methane-emissions-reduction-in-nigeria%E2%80%99s-oil-and-gas-sector-6552.pdf
[5] NGFCP, 13 January 2025, https://ngfcp.nuprc.gov.ng/about-ngfcp/
[6] PCNGi, Moving Nigeria forward with the power of CNG, 13 January 2025, https://pci.gov.ng/

Also, as against country's overdependence on imported fuel to meet its energy needs (a challenge which the Dangote Refinery hopes to address), Nigeria can upscale its local natural gas processing facilities, reducing demand for forex, thereby offering opportunities for economic growth. At this juncture, it is important to state that upscaling local gas processing capacity is influenced by different factors such as reliable and continuous local and international demand for gas, continuous exploration, and production of gas to ensure supply, available funding opportunities for gas projects and a core understanding of how the evolving role of renewables in the country's energy mix would impact energy demand into the future. An understanding of these interactions is needed to avoid possibility of stranded assets, a factor that could deter investment in local gas processing facilities. Nonetheless, considering the possible energy access and security offered by natural gas, it is evident that the resource remains critical to Nigeria's energy access and security, and ultimate energy transition.

However, it is important to note that Nigeria has a target of being net-zero by 2060 in line with country's Energy Transition Plan (ETP)[7], with the final aim of achieving just energy transition. This stipulates that there is need to decarbonize the country's energy sector. However, the continuous use and targeted upscaling of natural gas does not seem to align with this target as continuous expansion of natural gas exploration, production and utilization presents roadblocks that can impact this goal.

For context, it is reported by Stakeholder Democracy Network in its Nigerian oil industry environmental performance index[8] that in Nigeria, >300 billion cubic feet of natural gas was flared in 2020, amounting to ~18% of the country's CO2 emissions or an equivalent of the entire emissions of Ghana. Therefore, if natural gas production and utilization capacities are increased, gas flaring would likely increase alongside, releasing more greenhouse gases.

[7] Nigeria ETP, Nigeria's pathway to achieve carbon neutrality by 2060, 13 January 2060, https://energytransition.gov.ng/
[8] SDN, 2020 Nigerian oil industry environmental performance index, 2024, https://www.stakeholderdemocracy.org/wp-content/uploads/2024/05/EPI-Report-2020.pdf

This showcases how the continuous utilization of natural gas as outlined in the Decade of Gas initiative tends to contradict the goal of the ETP. Putting this into perspective, it is therefore important for the country to carefully navigate the implementation of the Decade of Gas Initiative, so that the goal of net-zero and just transition would not be defeated. It is suggested that in accordance with the principle of energy addition, as the country's energy demand increases, low carbon energy sources can be upscaled to meet the emerging energy demand, creating a diversified energy mix (where natural gas can indeed function as a transition fuel to a low carbon energy mix). Also, it is important that a scenario-based modelling should be carried out to unravel at what point upscaling natural gas utilization makes it impossible for renewables integration to support net-zero by 2060. Such study would inform an optimal pathway for the simultaneous implementation of the Decade of Gas initiative and ETP.

Further, it is imperative to highlight that the European market remains a significant player in Nigeria's gas export markets, with the EU market accounting for ~60% of the country's liquefied natural gas (LNG) export in 2023. Amongst other reasons, the viability of the EU market to Nigeria's export market is further strengthened by the energy crisis caused by the Russian-Ukraine crisis has created an energy import dependent EU, that creates a viable market for Nigeria's gas exports.

While this is commendable, it must be noted that the challenge of stranded and lock-in natural gas projects is evident, considering that the EU is aggressively cutting on carbon-intensive fuels in the future. For context, the EU methane regulation, a legislation passed by the EU aims to reduce methane emissions by its members by 30% in 2030, compared to 2020 levels, targets that are in line with the EU Green Deal and Global Methane Pledge. This puts forward that suppliers of LNG to EU member countries (such as Nigeria) must meet certain limits for methane emissions or risk being denied access to the EU market.

In this case, if natural gas production is increased in Nigeria without cutting on accompanying methane emissions, it is possible that the gas might become stranded with limited market, resulting in stranded and locked-in assets. This is further complicated by the fact that the Nigerian domestic gas market may not be able to offtake the produced gas, which is intended for export. In short, it can be presumed that global energy market disposition is towards low carbon energy, meaning that Nigeria must be intentionally align itself with this evolving reality or risk being left behind.

For instance, it is reported by IEA[9] that for the first time in global energy investment, investment in clean energy (estimated at USD 2 trillion) surpassed investment in fossil (~USD 1 trillion) in 2023, with a lot of these investment domesticated in the Global North, notably the EU. In other words, [TG1] this depicts an evolving energy market, where a significant amount of global energy demand would be met by low carbon sources, with the possibility of leaving Nigeria's natural gas resource and infrastructure stranded.

As a result, the extensive commercialization of Nigeria's natural gas should be done in tandem with extensive upscaling of its renewable energy sources. This can be done in a manner where the investments can be easily to integrated in low carbon energy value chains with minimal upfront costs. For instance, investment in natural gas production and utilization can be done with eyes on its use to produce blue hydrogen for exports. This offers a diversified approach that reduces the risk of stranded natural gas investments within the country. Finally, just transition within the Nigerian context is not without its unique challenges, however with the right approach, they can be circumvented and net-zero targeted by 2060 achieved.

[9] IEA, World Energy Investment 2024, https://iea.blob.core.windows.net/assets/60fcd1dd-d112-469b-87de-20d39227df3d/WorldEnergyInvestment2024.pdf