



MODULE 3

Jennifer Okeke

DOOWE



MODULE 3

The LPG Industry in Nigeria

The evolution of the LPG industry by providing final production and consumption figures.

Nigeria's Largest Online Cooking Gas Retailer

HISTORY OF LPG Market

Nigerian oil and gas production began in 1958, with the drilling of the first oil discovery well at Oloibiri (present day Bayelsa State, Niger Delta Region). Gas output began to rise in the early 1970s, eventually surpassing 2.7 billion cubic feet per day (bscf/d) by 1979. By this time, a domestic market had developed in the eastern portion of the country, near to the gas source, for the consumption of generated gas. Since 1990, daily gas output has gradually expanded, surpassing 8.2 billion standard cubic feet per day in 2015.

The steady rise in production in recent years can be attributed to the discovery of more non-associated gas (NAG) reserves in deeper reservoirs, the development of deep offshore oil fields with large associated gas (AG) reserves, participation in the gas export business through the Nigerian Liquefied Natural Gas (NLNG) Company, and rising demand for local gas supply for power generation. In 2015, Nigeria has 39 businesses actively involved in oil and gas production, generating natural gas from 189 fields with daily AG output of 4.74 billion standard cubic feet per day and NAG production of about 3.46 billion standard cubic feet per day.

Domestic gas demand in Nigeria, together with regional demand from the larger West African area, is expected to boost annual gas output in Nigeria past the 10 bscf/d barrier by 2020, according to forecasts. By 2050, the world population is predicted to reach almost 10 billion people, causing global energy consumption to increase by about 60% above current levels by 2060.

Gas was first used in Nigeria in 1963, when the Shell Petroleum Development Company of Nigeria (SPDC) sold gas to industrial customers in Aba. From the mid 1960s to the late 1990s, the government launched many programmes to boost gas utilisation in the nation in order to add value to AG, which was frequently flared by operators. Gas supply to thermal power plants in Delta State, the Port Harcourt refinery in Rivers State, Power Holding Company of Nigeria (PHCN) Sapele, Delta Steel Aladja, Nigerian Fertilizer Company of Nigeria (NAFCON), the Ajaokuta Steel

Complex, the Egbin Thermal Power Station, and the Aluminum Smelting Company of Nigeria (ALSCON) in Ikot Abasi were among these projects.

CURRENT STATE OF THE MARKET

The gas business in Nigeria is still immature, with gas products struggling to acquire domestic market acceptability. However, LPG appears to be standing out, with rising domestic adoption. On March 29, 2021, the Nigerian government launched the 'Decade of Gas,' an effort aimed at ensuring that Nigeria can benefit from the global energy shift. Its principal application in Nigeria has been for domestic purposes. Regardless, LPG has a wide range of applications, including vehicle fuel and chemical feedstock. Nigeria's domestic LPG usage surged by almost 300 percent in seven years, from 250,000 metric tonnes in 2013 to over one million metric tonnes in 2020. Nigeria's status as one of the world's fastest-growing LPG markets is reflected in its quick surge in LPG usage.

While the expanding LPG adoption rate (thanks to LPG's low carbon intensity) offers great potential for Nigeria's clean energy strategy, the country does not appear to be ready for large-scale LPG adoption in its domestic market. A lack of preparation is attributable to a variety of barriers, including a lack of LPG retail market regulation, a paucity of LPG facilities, and an unsolved cylinder dilemma in the country.

THE AVAILABILITY OF LPG FACILITIES

LPG facilities are few in Nigeria. The lack of a rail or pipeline distribution network makes the LPG transportation network vulnerable. This is compounded by the lack of suitable storage and bottling facilities. Nigeria's present LPG storage capacity is 69,968 metric tonnes, which is much less than South Africa's capacity of over 200,000 metric tonnes. Similarly, only around 200 LPG bottling factories are registered in Nigeria, with the bulk of them located in metropolitan and semi-urban regions. To put these statistics in context, for every one million Nigerians, there is only one

registered LPG bottling facility. This is in stark contrast to South Africa, which has 4,452 refilling plants and a population of around 58.5 million people, compared to Nigeria's population of 200 million.

Nigeria's LPG business clearly has an issue with infrastructure. Nigeria has to increase investment in LPG in order to overcome this problem. While recent investments like as the Ajaokuta-Kaduna-Kano gas pipeline project are noteworthy, they are insufficient to address Nigeria's retail market deficit. As a result, Nigeria must step up efforts to encourage private sector investment in the downstream gas industry by developing a comprehensive investment programme focused on expanding LPG availability. The transfer of cash for the building of storage and bottling facilities, as well as the supply of finance to potential downstream LPG investors, would be part of such an investment programme.

A RETAIL MARKET WITHOUT REGULATION

The LPG retail sector in Nigeria is mostly uncontrolled. This is mostly due to the fact that gas resources were not adequately considered at the drafting of Nigeria's major oil and gas regulatory law, the Petroleum Act, in 1969, and as a result, the Petroleum Act has remained predominantly oil-focused. The Petroleum Industry Bill, which has been in the legislative pipeline for over a decade and was finally enacted by the Senate this week, is the government's attempt to address this issue. Lack of sufficient regulation has led in a large number of unregistered and unlicensed LPG operators, which has had disastrous effects.

Despite evidence that LPG decanting increases the danger of explosions, the practise continues to be common, with unlicensed roadside gas refilling stations littering around the country decanting LPG to customers. Illegal LPG operators have not only resulted in massive losses for gas investors, but they have also put Nigerians' lives in peril. The infamous 2014 Ondo gas explosion, which was caused by the activities of an unlicensed gas refilling station, is a prime

example. Over 42 stores and residences were destroyed in the blast, and over eight individuals were badly injured.

THE IMPORTATION PROBLEM

Nigeria still imports over half of its LPG supply, and while import growth has slowed, it is still increasing. LPG imports, largely from the United States and Equatorial Guinea, accounted for 52.3 percent of total Nigerian LPG supply in H1 2021, compared to an average of 53 percent in 2020, according to Hawilti.

Domestic LPG suppliers in Nigeria remain scarce, with Nigeria LNG accounting for 75% of total domestic LPG supply in H1 2021. This year, new local providers have appeared in Kwale, Oredo, Egbaoma, and Rumuji. However, in comparison to market demand, their manufacturing capacity are limited.

Simply said, LPG is a huge import replacement business in Nigeria. Those who create will find a market if they are prepared to sell domestically rather than chasing foreign exchange on the global export market.

In the meanwhile, infrastructure is being built. Ardova's 20,000MT plant and Gas Terminalling's 5,000MT project in Lagos, as well as Chimons Gas' 5,500MT facility in Warri, are now under construction (Delta State). All of them anticipate commissioning by the end of 2022.

Ardova's 20,000 MT storage facility in Lagos would primarily serve as an import and blending terminal, combining propane and butane once fully operational, according to a company executive. It would also be able to receive LPG cargoes, whether they are imported or coming from Nigeria LNG.

In the meantime, Banner Energy is nearing financial closure on its own \$65 million, 13,000 MT LPG facility in Akwa Ibom. It would be the largest facility in Southeast Nigeria, and Banner Energy has hired a financial advisor to help them get to financial closure.

For years to come, LPG will be a popular product in Nigeria. Price increases are being driven by supply interruptions, which is boosting market activity as various new private sector actors look for trade possibilities in the short and medium term. The true issue for the industry's growth, however, would be determining the best business models for Nigeria's 40 million households in need of healthy and clean cooking fuels.

PRODUCTION AND SUPPLY IN NIGERIA

- **LPG supply in Nigeria is largely from crude oil and natural gas processing facilities in the country. The LPG qualities mix specified for the Nigerian domestic market is one that is butane rich, which is either 70:30 or 80:20 butane/propane mix. At present, LPG received from NLNG contains about 94% butane while the propane derived from the fractionating plant is exported.**
- **Propane finds higher application in polypropylene plants and heating and as such produced propane in the country is intended for export or exported.**
- **Producers of LPG in the country include NLNG, IOCS (Exxon Mobil and Chevron), the refineries (Port Harcourt and Warri) and independent gas plants.**
- **The biggest local supplier is the NLNG Limited which supplied 275,000MT of LPG to the domestic market in 2019. This represents about 32% of supply.**
- **Data from the National Bureau of Statistics (NBS) indicates that 526,059MT was imported into the country last year accounting for 62% of total supply. This means that the NLNG and the NNPC Refineries and some local producers all accounted for 38% of supply.**

- The Oredo Integrated Gas Handling Facility being developed in Edo state by NPDC (This facility is expected to have a capacity of 100 million cubic feet and deliver 260,000MT of LPG per day) and the on-going construction of Dangote Refinery (This facility would have a capacity of 650,000 barrels of oil per day) is expected to boost LPG production and supply in the country.

Constraints of Production and Supply in Nigeria

Logistics

- Insufficient coastal storage capacity which renders deliveries of LPG cargo impossible.
- Reluctance of investor purchasing large LPG vessels (12,000MT and above) due to insufficient coastal storage
- Absence of transportation of LPG by rail resulting in overdependence on land transportation

Regulatory

- Unavailability of Nigerian flagged LPG vessels and the Cabotage Act which limits operations of foreign vessels
- The LPG sector is deregulated and increasingly fragmented as such pricing is determined by each individual street vendor

Others

- Unwillingness of operators and major stakeholders to invest in LPG vessels suitable for coastal transportation due to anticipated unprofitability as a result of low utilisation
- Significant transportation cost incurred as a result of long distance associated with moving LPG from the coastal storage facilities located in Lagos to other part of the country

LPG STORAGE IN NIGERIA

- **LPG bulk storage facility which could either be coastal or inland is a vital part of the supply chain and a major driver of in-country market supply. Coastal storage represents about 74% of available LPG storage capacity while inland storage accounts for the remaining 26%.**
- **There are currently about 10 functional coastal storage facilities (Forte Oil, PPMC, Sahara Energy, Total, Navgas, NIPCO, Stockgap, Matrix, Rainoil, Prudent Energy, Technoil) with total operational capacity of 68,900MT. Eight of the ten functional coastal storage facilities are located in Apapa resulting in a major supply constraint due to congestion.**
- **Additionally, there are seven inland storage facilities all owned by the PPMC with a total capacity of 7,000MT. These facilities are largely dependent on the Refineries for supply.**
- **In addition to extant LPG storage facilities, there are upcoming storage capacities aimed at boosting the overall LPG storage capacity in the country. A notable trend is the location of a number of the upcoming LPG storage facilities in the South-South region of the country due to its coastal nature and proximity to sources of LPG production.**
- **Some implications of additional storage capacities are (i) potential increase in the number of jetties and vessels in operation (ii) increased product availability (iii) storage operator will most likely act as offtakers for upcoming domestic producers to ensure regular throughput.**

Constraints in LPG storage in Nigeria

Logistics

- Non-operational facilities in South South.
- The bottlenecks of accessing transportation and exiting Apapa.
- Inadequate supply resulting in products period of stock-out.

Regulatory

- Proliferation of non-compliant skid plants and weak enforcement of existing regulations.

Others

- Inconsistent safety checks on cylinders in circulation, insufficient number of facilities for cylinder revalidation and recertification.

LPG PRICING IN THE NIGERIA MARKET

According to a market study conducted by Energy Vanguard, the price of the 12 kilogramme, kg, which was N7, 500 in January, has risen to N10, 500 in Lagos, Abuja, and other cities. Many homes have been forced to transition to other fuels, namely charcoal and kerosene, as a result of the development.

The average price of refilling a 5kg cylinder of Liquefied Petroleum Gas (Cooking Gas) climbed by 8.23 percent month over month and by 21.42 percent year over year in September 2021, rising from N2,215.33 in August 2021 to N2,397.60 in September 2021.

Zamfara (N3,000.00), Kano (N2,900.00), and Sokoto had the highest average price for refilling a 5kg cylinder of Liquefied Petroleum Gas (Cooking Gas) (N2,860.00).

Osun (N1,902.05), Edo (N1,901.55), and Lagos had the lowest average price for refilling a 5kg cylinder of Liquefied Petroleum Gas (Cooking Gas) (N1,858.31).

Similarly, the average price for refilling a 12.5kg cylinder of Liquefied Petroleum Gas (Cooking Gas) climbed 36.55 percent month over month and 49.97 percent year over year in September 2021, from N4,514.82 in August 2021.

Cross River (N6,944.44), Anambra (N6,897.92), and Ogun had the highest average price for refilling a 12.5kg cylinder of Liquefied Petroleum Gas (Cooking Gas) (N6,779.17).

Niger (N5,175.00), Borno (N5,100.00), and Osun had the lowest average price for refilling a 12.5kg cylinder of Liquefied Petroleum Gas (Cooking Gas) (N5,006.25).

