

Appraisal of Legal Frameworks for Gas Utilization Under Petroleum Industry Act 2021

¹ThankGod Okeokwo,

²Nuhu John Egya &

³Samson Atari Namu

^{1&3}Faculty of Law,

Federal University Wukari,
Taraba State

²Department of Humanities and
Social Sciences,

School of General Studies,

Federal Polytechnic Nasarawa

Article DOI:

10.48028/iiprds/ssljprds.v9.i1.01

Keywords:

Gas Utilization,
Department of Gas
Resources,
Sustainable Gas
Utilization.

Corresponding Author:

ThankGod Okeokwo

Abstract

Nigeria has proven gas reserve estimated to be about 188 trillion cubic feet (tcf), the 9th largest gas reserve in the world proposed to last for the next 150 years. With all the potentials of gas in the modern-day society like the use of gas for the generation of electricity, powering of industries and factories, utilization by way of domestic house warming and as source of other forms of energy; Nigeria is yet to realize and deploy these potentials to its citizen's benefit. Therefore, this paper appraises the legal framework for gas utilization in Nigeria with a view to suggesting the way forward. The advent of the Petroleum Industry Act 2021 repealed some laws in the petroleum industry but made some extant subject to conversion of subsisting contracts/licenses/lease. Critical analysis is done on the laws and policies/regulations governing gas utilization in Nigeria with a view to exposing the areas of strength and point out lapses and suggest the way forward. It is found that gas utilization in Nigeria is deficient owing to unpatriotic leadership, inexperienced personnel, dearth of technological know-how, monopoly of government as to the ownership of the resource and lack of political will to do what would be beneficial to the nation has led to the under-utilization of gas in the country. It is recommended that modern technology, best industry practices, trained personnel, political will and new creation of Department of Gas Resources should be adopted for sustainable gas utilization in the Country. In conclusion, the paper foresees better utilization of Nigerian gas resources for the betterment of the present and future generations.

Background to the Study

Gas utilization in Nigeria has its origin with the discovery of oil in commercial quantity in 1956 at Oloibiri town, in the now Bayelsa State Niger Delta area. Gas can be associated with the oil in the strata or can be found in large deposit in the sedimentary rocks. Where it is found with the oil in the process of production, it is said to be associated while, if it is found alone it is non-associated Ojide (2012), "Non-Associated Gas is free natural gas not in contact with, or dissolved in Crude oil in the reservoir. There may or may not be condensate production together with the gas"¹. Gas could be found alongside the oil because it also contains hydrocarbon just like the oil. In the cause of exploration for crude oil, gas deposits were discovered and it is estimated that Nigeria is the 9th largest reservoir of gas with proven reserves of 188 trillion cubic feet.² Hydrocarbons are harmful to human health, animals, fishes and flowers and other non-living creatures of the environment where it is spilled in the case of oil or flared in the case of gas. The production of gas may involve, even with the best of international practices, the flare of gas for safety of humans who do the work at the rig or production location. If it is flared for the purposes of safety, it is not usually in large quantity and with safety measures and technology; gas flare for the purposes of releasing the production process in a safe manner would not be continuous. Continuous flare of gas is not economical for a developing nation like Nigeria since it causes harm to the economic, social, environmental, health and atmospheric wellbeing of the people. Gas flare affects both the immediate environment where it is stacked and the being an atmospheric object, can transcend boundaries to cause desertification, drought and extension of some fauna and flora. It may even alter the genetics of human, animal, flora and fauna since these creatures depend on the air which had been polluted by gas flaring for their living. The advent of the Petroleum Industry Act 2021 repealed some laws in the petroleum industry but made some extant subject to conversion of subsisting contracts/licenses/lease; therefore, making it necessary to include such laws as part of the legal framework pending conversion to the new legal order by those subject to such contracts/licenses/leases. In this paper, I shall discuss some international best practices in gas utilization as a solution to gas flaring and how economics of waste can be turned into social benefits through gas utilization in Nigeria. Critical examination will be done on the existing gas projects for utilization in Nigeria and West Africa and suggestion made for the way forward on gas utilization.

Clarification of Terms

Compressed Natural Gas it can mean an alternative to transport fuel, environment friendly and modest means of transporting large quantity of natural gas. Domestic Gas is gas utilized locally within the shores of Nigeria either for home, industrial and or electricity power use, specifically for industrial use, gas used in value adding industries such as methanol, fertilizer is considered domestic gas, regardless of whether the end product that is fertilizer, methanol is consumed locally or exported. Flare Gas: any natural gas produced in association with crude oil and/or condensate by a Producer and finally diverted toward a flare site by the Producer with the intent of flaring the natural gas so diverted, including any such natural gas from a green-field project. Gas Utilization is the marketing and distribution of natural gas for commercial purpose and includes power plant, liquefied natural gas, gas to liquid plant, fertilizer plant, gas transmission and distribution pipelines. Liquefied Natural Gas (LNG)

consists mainly of methane. Liquefied Petroleum Gas (LPG) is a mixture of propane and butane which are gasses that become liquid under pressure and can then be stored in pressurized containers Ojide (2012). Natural Gas is a fossil fuel that contains a mix of hydrocarbon gases, mainly methane (CH_4), along with varying amounts of ethane (C_2H_6), propane (C_3H_8) and butane (C_4H_{10}).³ Natural Gas Liquids (NGL) are natural gas in liquid form as a result of processing or fractionating or cycling. Nigeria LNG Limited is a joint venture incorporated in 1989 to produce LNG and NGL. The company is owned by Nigerian National Petroleum Corporation (NNPC) (49%), Shell Gas B.V. (25.6%), Total Gas Electricity Holdings France (15%) and Eni International N.A.N.V.S. (10.4%).

Theoretical Framework

The social cost theory is deployed in the analysis of the legal framework for gas utilization in Nigeria. This theory sums the private and external costs in ascertaining profit. It is the cost of natural resources for which the firms are not required to pay, for example, rivers, lakes, atmosphere etc. social cost theory had been defined thus “Social costs are private costs borne by individuals directly involved in a transaction together with the external costs borne by third parties not directly involved in the transaction”. The Federal Government pursuant to their ownership of oil and gas in Nigeria contracts or licenses a corporation to explore or mine gas resources. The agreement exists between government and such company, yet the environmental and other social impact of such contract is borne by the third parties: host communities and their residents. For example, this theory explains that the social cost of the gas production and utilization should be considered in enacting laws and making policies/regulations. Social cost referred to the cost of pollution remediation and restoration, the worth of life expectancy of individuals in a community where gas is not utilized but flared, health cost resulting from inadequate or improper gas utilization, the cost of keeping group or community safe or relocating them while producing gas, environmental restoration cost and all other externalities that are not usually put into consideration by the government and the international multinational corporations in their economics of production and profit Ehirim (2018), This theory postulates that health cost, environmental cost and atmospheric cost of the effects of inadequate or improper utilization of gas should be put to consideration in framing laws and making policies/regulations governing production and utilization of gas to achieve sustainable and socially viable gas utilization in Nigeria. The advocacy of this paper is a gas utilization regime in Nigeria that does not make only economic sense: maximizing profits and satisfying some few individuals' wants over the life and health of millions of her citizens in the Niger Delta region rather a legal framework that considers the good of the people and elevates it over and above cheap but socially costly market efficiency.

Literature Review and Analysis

The views of scholars on the extant legal frame work for gas utilization shall be reviewed to ascertaining the positions of these legal publicists. A few of the laws and policies/regulations shall be top notch in this paper in explaining the way(s) forward for gas utilization in Nigeria. Ehirim (2018) in their work “Towards Effective Domestic Natural Gas Utilization in Nigeria” proposed six strategies for gas utilization to included, Gas to Power, Gas To Liquid, Enhanced Oil Recovery, Feedbacks For Petrochemical Industries, Gas As Residential Fuel and

Underground Storage. Putting gas for the use of electric power generation is one of the strategies these scholars proposed in the face of the epileptic/non-existent electric power challenges the Country is laden with Oyedepo (2012). They hold the view that electric power being a source of energy for many modern economic drivers, gas could be used for gas turbines to generate such quantum of electric power as the people in a particular locality may be able to consume. The billions of Dollars spent on foreign exchange importing generator would be reserved for better economic utility plus the noise pollution the environment would be savaged. A nation can grow into industrialized economy to the extent it could general, supply and sustain electric power. This is because the wheels of industries run on electric power which can be neatly generated from clean energy like gas. Gas to liquid is another use to which gas can be utilized. Gas to Liquid is the conversion of natural gas through a chemical process into a liquid form for ease of transportation. When natural gas undergoes a certain chemical process for conversion into liquid, it becomes easier for producers to transport it through the air, land or sea to their places of demand for marketing purposes. This method or strategy works and is deployed for areas where pipeline seemed unaffordable or technically complicated to construct. The company simply converts the natural gas to liquid and moves it with whatever means of transportation is convenient at the time. Enhanced Oil Recovery strategy is used for gas when production is at the second stage to enhance oil production with special flare capture technologies. According to the authors “enhanced oil recovery can begin after a secondary recovery process or at any time during the productive life of an oil reservoir. Its purpose is not only to restore formation pressure, but also to improve oil displacement or fluid flow in the reservoir.” Reservoir pressure is required for production operation to take full course in every stage of production. Where the required pressure is not available, desired results from the well or reservoir may not be attained hence resulting in waste. Thus, this strategy is deployed using gas to cause displacements or increase pressure in the reservoir. For Feedstock for Petrochemical Industries, the authors deployed a diagram to show the feedstock linked to gas utilization after natural gas had been treated/processed:

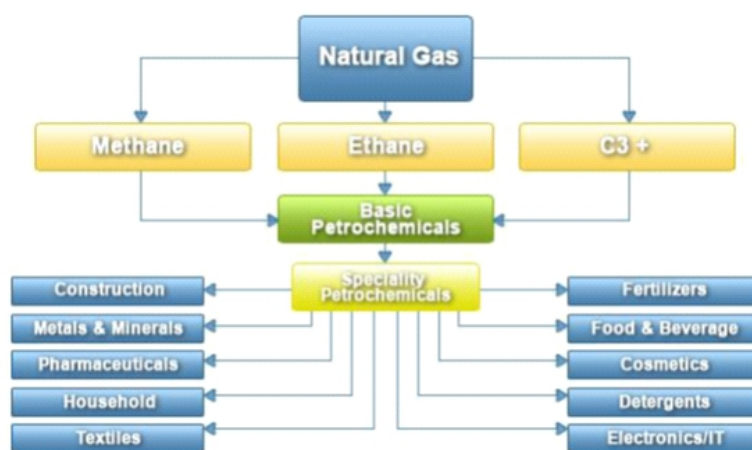


Figure 1: Petrochemical Products from Natural Gas

It is clear from the figure 1 above that the uses to which Gas can be put into are numerous and far reaching for economic grow, infrastructure build, technology advancement, health tourism and other gargets that can be produced when gas is fully utilized within the available modern technology. Gas for Residential Fuel is the utilization of gas for heating or cooking, refrigerator and air conditioner and for such other domestic appliances. Therefore, gas utilization affects industrial, social, economic and infrastructural development and advancement to industrialization of a given State Oyedepo (2012). Another use to which gas have been scientifically proven to be put into is for storage underground either for lack of adequate demand or for future use. Where the demand for gas does not meet the cost of production, it can be stored for a time when the market would be favourable. The operation for the storage of gas underground is called reinjection. It required special flare capture and reinjection technology for this strategy to be deployed. But whenever it is deployed, the results are usually mutually beneficial to the Operators and the Government as well as to the environment. Reinjection is in fact a sustainable and environmentally health practice of international standard in the gas industries. These scholars argued that underground storage strategy offsets change in natural gas demands, reduces price vitality, enables operators meet regulatory obligations, levels production over fluctuating demands periods and balances the flow of pipeline systems.

Onolemhemen (2017) these authors argued from the economic perspective of gas utilization when they posited that " natural gas remains one of the most efficient forms of energy source, and it is found in abundance in Nigeria with a proven reserve of over 180 trillion cubic feet of natural gas ..." They pointed out the fact that economists and analyst agreed that the source of energy as gas is instrumental to efficient economic growth. Given the proven reserve of natural gas that Nigeria has, it would be unwise not to explore this abundant resource for economic growth of the 2020 poverty capital of the world. They relied on other scholarly works to argue that there are challenges facing gas utilization in Nigeria which have made the country not to maximize the full potential of market efficiency in the local and international markets. Those challenges as pointed out by these scholars are not limited to the following: inadequacies in infrastructural development funding, inefficient regulatory framework and gas policy for the domestic use, unsustainable exploitation practices, lack of gas utilization infrastructure, Nigeria flare gas policy among others. They furthered their argument based on information available at the United States Energy Information Administration to assert that "natural gas consumption rose from 37.8 billion cubic feet in 1980 to 385.64 billion cubic feet in 2006 ..." This consumption is arguably estimated to be higher in 2021 given Nigeria current demography compared to that of 2006; pointing to the fact that there exists empirical certainty that Nigeria gas market is huge and growing as the population grows. They argued that literature agreed that gas utilization/consumption has direct positive impact on the economy of the nation in relation to capital, labour, exports and domestic production. As gas utilization and consumption impact these factors of economic growth, the growth in population and industries further strengthens and opens up more domestic markets for gas products thereby improving employment index, poverty lines margin closes and health as well as life expectancy elongated.

Dimitroff (2019) “In the case of natural gas (currently comprising 25% of total global primary energy and growing at 2.5% per annum), the value chains that link vast networks of infrastructure spanning upstream production to downstream utilization, often conclude with the generation and offtake of power.” He observed that global gas utilization is on the increase with about 2.5% per annum. He explained that upstream production and downstream utilization is dependent of networks of pipelines that involves hug amount of financial and technological investments and innovations. He furthered that pipelines are key components in all mid-stream gas transportation systems and, until relatively recently, they comprised the entire network of transportation infrastructure from upstream to downstream. The author believed that LNG now plays an important role in delinking the delivery of gas to specific markets through fixed infrastructure enabling convergence of regional gas market pricing *en route* to global commodity pricing. Investments in pipeline infrastructure to regional and global markets determined the pricing of gas in the market which in turn informs the decision of investor. This is the current status of the gas utilization in Africa and Nigeria in particular where investors are not sure that market demands could assure recouping of their investment and thus grantee supply of natural gas. According to Thomas “Unsurprisingly, gas pipeline infrastructure is vastly uneven in its geographic distribution. For example, out of a total of 3.5 million kilometers of gas pipeline globally, 2.225 million kilometers (~64% of the global total) are located in the United States. Sub-Saharan Africa, on the other hand, holds approximately 4,100 kms of gas pipeline (1.5% of the global total). This disparity is also broadly consistent with the disparity in annual *per capita* GDP between the two regions--\$64,700 versus \$1,700 respectively.” From the simple analysis, it is shown how transportation of natural gas and gas products to its utilization points can affect both the economy of a nation and the welfare of its citizens. The supply chains determine the availability, affordability and sustainability of gas usable in driving both homes and industries for consumption and production. This further explains the position in this paper that gas utilization has increasing impact in the growth of Nigeria economy and welfare of its citizenry. Hence, government must initiate laws and policy/regulations for gas production at the drafting point of production sharing contracts or its renewal, in all joint ventures or licenses as well as enable independent liability company to take full responsibility for the day to day running of gas infrastructure and facilities in the country. There are correlations between gas network coverage and affordability/sustainability of supply of gas to homes and industries. Countries where there exist sufficient networks for gas utilization tend to have gas utility more affordable and available than countries which invest little on gas infrastructure.

Buford (2019) observed “The natural gas pipeline systems in the United States of America [USA] generally consist of the following: Gathering lines-move the produced natural gas from the wellhead to systems in the field that store and initially process the produced natural gas; Feeder lines- move natural gas from storage tanks and processing facilities to transmission pipelines; Transmission pipelines- move the processed natural gas over long distances from supply areas to market areas; and Distribution lines – move then natural gas to the residential, commercial, industrial, and power generation end-users. The author categorized pipelines to four uses to which they are put in the USA. This can be replicated in Nigeria for gas utilization efficiency and supply of gas products to the local, regional and international markets. The

movement of natural gas from well head to facilities where they are stored and then to facilities for treatment and onward to markets and finally the type designated for distribution to homes and industries can be replicated in Nigeria. It is argued that this categorization helps in determining the quantum produced, assures verifiable processing and provides data for feasibility studies and attracts investment in the sector. Once gas is produced, then there arise the needs for storage, transportation and distribution to the end users. The Nigerian Gas Company under the NNPC can adapt this categorization for sustainable gas utilization in the country. Pipelines lifecycle calls for planning phase, construction phase, operation and maintenance phase, decommissioning and abandonment phase, and reclamation phase. History had it that humans have been aware of the natural flammable gases from the earth for at least several thousand years. Accordingly, Gas was not used extensively as a fuel source until the nineteenth century even if natural gas was used early in 1821 to illuminate the town of Fredonia, New York in the United States of America but was not widespread until the rise of petroleum industry. Barnes (2019).

For the purposes of understanding gas utilization, the Nigeria National Gas Policy defined gas value chain to include the upstream, midstream and downstream as follows: “Upstream: Gas is related to exploration for, development and production of gas; drilling and operation of gas producing wells; construction and operation of gas gathering pipelines; gas separation and treatment facilities and operations; transportation of personnel and equipment to and from upstream gas locations and facilities. Midstream: Gas is related to construction and operation of gas transportation pipelines, in general after the flow station; gas processing facilities; natural gas liquefaction plants; gas bulk storage facilities; shipping of gas and related products; other bulk transport methods, such as rail, barge and trucks for transporting gas and related products on a wholesale basis. Downstream: Gas relates to construction and operation of facilities for distributing gas to customers; retail stations for CNG; city gate reception terminals for gas; distribution of gas; wholesale marketing of gas and gas products; marketing, retailing and sales of gas.

The upstream strands of gas begin technically with the exploration of natural gas and development of same with analysis to ascertain its commercial viability for production. This is where the National Oil Companies and the Transnational Corporation apportion risks and profits vide a production sharing contract on the leased or field. When commercial viability is ascertained, operations and drilling is intensified on the well or wells to cover production cost and establish profit for the national corporation and their multinational risks bearers. Construction and gathering pipelines are deployed for evacuation of raw natural gas for separation and treatment in the facilities and then transported for midstream or downstream operation.

Construction of gas pressing facilities and transportation operation through gas pipelines, ships, rails, barges and trucks for wholesale constitutes the main stay of the midstream gas production operations. While at the downstream, distribution and retailing to customers and supplies to target markets are carried out. It is at the midstream and downstream sectors of natural gas operation that gas utilization features prominently as to the uses it is put to like

powering electricity supply facilities, fertilizer plants, treated compressed and cooled for domestic utility and serve as fuel for glass, food and beverages manufacturing industries. The Nigerian National Petroleum Corporation (NNPC) with its Department of Petroleum Resources (DPR) as well as the Nigerian Liquefied Natural Gas (NLNG) are the main institutions manning the gas sector. NLNG was created as a limited liability company in May 1989 for the purposes of gas production and utilization in Nigeria and export particularly the Liquefied Natural Gas (LNG) and the Natural Gas Liquids (NGLs). It has seen to the development and distribution of gas for homes and houses uses in Nigeria and they are expanding distribution wholesales and retailing networks especially within Nigeria and West Africa, Dike (2015).

Dike was of the view that “securing an adequate supply of natural gas requires long-term planning, complex infrastructure, adequate investment...”⁴ The learned author opined that the obligations placed on the stakeholders were inadequately met resulting in deficient production, inadequate availability of LNG, pipes for conveying LPG and other petroleum products. Gas infrastructure should be proved by the Government as a public service necessity if it wants to see a viable supply of gas products to the use of citizens. A defined percentage of gas product must be designated for domestic use and consistently supplied by the IOCs and stored/transported by the national gas companies to a reserved depot or plants. Again, government must take proactive steps to allay the fears of loss of investment in the gas utilization projects because of low pricing by the IOCs; this can be done vide a market efficient pricing tariff/ regime.

Ojide (2012), said that energy is at the core of human existence. It is also the pillar of wealth creation. As such, modern society cannot seriously address issues of development if such consideration is not based on the foundation of effective energy planning and management that enhances optimal utilization, regular supply and availability of energy resources.⁵ The authors argued that inadequate energy planning and management had led to flaring of associated gas in Nigeria thereby depleting the supply of usable gas. Furthermore, optimum utilization of gas has been a mirage because of insecurity of pipelines and other critical infrastructure required for sustainable gas utilization in the country. Therefore, understanding the sustainability and economic impact of gas utilization have become areas of critical studies. According to Ojide et al what drives gas utilization projects in Nigeria had been the creation of wealth and diversification of the economy. Nigeria gas utilization had been for the purposes of power generation, industrial heating, fertilizer and petrochemical manufacturing and as feedstock for direct steel reduction.

Aliyu opined that the uses to which natural gas can be put include that it drives innovation and touches nearly every field and aspect of life that we care about; from mobile phones to makeup, to medical devices, bank cards and football. Natural gas is used as raw materials for making fertilizer, antifreeze, plastics, pharmaceuticals and fabrics. Paper and steel industry use natural gas as process steam.

Africa Oil and Gas Report: Gas utilization had been grouped into three categories: strategic domestic sector, strategic industrial sector and commercial sector. The strategic domestic sector refers to gas utilization in the power sector for residential and commercial light users. The strategic industrial sector is the utilization as feedstock in the production of value-added products that are primarily destined for export or in some cases, consumed locally. This strategy is built for value addition on natural gas before it is shipped out of the country which will engender industrialization and create employment. Projects like Methanol, GTL and fertilizer are in this category. To attract investment in this category government, have to ensure price is affordable and predictable to bring in competitiveness in the international market. The third category is the commercial sector gas utilization which squares in the cement and manufacturing as well as power industries. Theirs is to deploy gas as alternative to fuel in powering their manufacturing and thus retain the ability to bear high cost of gas (Africa Oil and Gas Report 2008).

Occhiali (2015), were of the view that “internal gas prices are held below international levels and payment risk and institutional obstacles have determined little incentive to increase production to meet domestic requirements to supply power.” To these authors, the gas utilization would suffer setbacks if prices that seems affordable by the domestic market is below production by the IOCs or any investor in the gas sector. Again, the fluctuating responses of the government of Nigeria during cash calls on their part of investment in the sector had discouraged prospects for gas utilization in the country. Institutional weakness in regulation, expertise and technology required for the management of resources available in the sector had been a challenge owing to institutional corruption which constitutes a great obstacle in the wheels of gas utilization in Nigeria. Nigeria Gas Company if properly managed can supply gas for the use by power generating firm, cement and fertilizer industries, steel and ceramic industries as well as manufacturing and other end users of gas in the country. The abundance of natural gas has not been felt by the Nigerian communities in their domestic needs and supply of electricity. This weak utilization of gas resources is owing to limited technological know-how, inadequate infrastructure, and inadequate energy efficiency practices, weak infrastructure maintenance and attacks on energy infrastructure and unwillingness to enforce regulation by institutions of government in the country.

Oyedepo (2012), opined that gas utilization as a means to energy has the potential and connectivity with productivity, income growth, education and health. He furthered that energy supports basic needs like cooked food preservation, comfortable living temperature, lighting, piped water and sewerage, educational aids, communications by way of radio television electronic mail and transport. The social value of modern gas utilization is evidenced in agriculture, commerce, manufacturing, industries and mining with energy generated by gas and other sources of energy. Therefore, there not parts of human endeavor that gas utilization cannot impact positively if it is given the priority attention it deserved by government, national companies, IOCs and other participants in the sector.

Legal Framework for Gas Utilization Petroleum Industry Act 2021

Gas utilization is directly vested in the Midstream and Downstream Petroleum Regulatory Authority also known as the Authority under the Petroleum Industry Act (PIA) 2021. This is so because gas can only be utilized in this sense after production. For example, section 33 PIA provides *inter alia* that the Authority may make regulations concerning “the processing, refining, transmission, distribution, supply, sale and storage of petroleum and petroleum products as well as other midstream and downstream petroleum operations”. It follows therefore, that the operations of the Authority is wholly concerned with processing, refining, transmission, distribution, supply, sale and storage of petroleum and petroleum products. And production is vested in the Upstream Petroleum Regulatory Commission also known as the Commission under the PIA.⁶ The upstream Commission can utilize gas for underground reserve and reinjection to enable production of oil where the gas is not conventional or in commercial quantity or are associated.⁷ Section 7(c)(ii) PIA particularly provides the guide to the primary functions of the Commission when it enacted: “management of petroleum reserves and installations, and exploration, development and production activities within the onshore, frontier, shallow water and deep offshore acre ages of Nigeria;” it lines out the areas of primary operations for the Commission. Nevertheless, it is the Authority that deals with refining, reservation, transportation, distribution and wholesale as well as retail-sales.

The opposite of gas utilization is gas flaring. Therefore, it is in processing, refining, transmission, distribution, supply, sale and storage of petroleum and petroleum products that gas utilization can take place. In the event that processing of natural gas (whether associated or non-associated) is done with economics of flaring instead of utilization, the whole processing activities would turn out to be anti-environmentally friendly/acceptable or sustainable manner or practices envisaged under section 31 (C) of the PIA. Processing requires a lot of testing which is already provided as an exemption for flaring under section 107 (b) or section 104(1) (b) PIA 2021. Once the intention of the Authority is to save cost instead of to save the environment and human lives, then, recourse would always be had to sections 107 (b) & 104 (1)(b) against the original aim of processing in an environmentally friendly/acceptable and sustainable manner contemplated under section 31 of the PIA. Gas utilization is not just in the law but whether the operators of the law would give it a chance?

Pursuant to section 125(1) (a) PIA 2021, it vested in the Authority the powers to issue processing license to prospective natural gas processing company or body or individual. The corollary, it is illegal to operate a natural gas processing facility without the authorization or permit or license issued by the Authority. The innovation with the PIA is the provision for third party access to the facilities for the purposes of dealing directly with the Authority in any sphere of its powers. One may not need to own all the technical know-how, if he has the financial capabilities required for the particular midstream or downstream operations.

Natural gas refining is the process or an activity that involves purifying raw natural gas by removing impurities, contaminants and higher molecular mass hydrocarbons to produce

what is known as pipeline quality dry natural gas.⁸ It involves heating, mixing with chemicals and changing the natural gas from natural to other forms that could be utilized for purposes pre-designed by the refiner.⁹ This could be done in large scale or in modular forms. There are third party access rights under the PIA for individuals who may not have all the capital for the infrastructure needed to refine. An application to the Authority, if the applicant satisfied the Authority of its financial and technical capabilities could be permitted or granted some form of license to access pipelines or train conveying natural gas for the purposes of refining.

Section 125 (1) (d-h) PIA covered the field for transmission, distribution, supply, sale and storage of natural gas without license authorization or permit by the Authority. It is not lawful, unless by licence of the Authority, to retail or distribute or supply natural gas; it is also not lawful to establish, construct or operate gas distribution network without an express authorization by the midstream and downstream regulatory Authority.¹⁰ Where a person carries on activities in the natural gas sector of the midstream or downstream without authorization, the Authority may seal the premises, seize the facilities deployed for the activities, confiscate and dispose of equipment or materials or impose penalties prescribed by its regulations for the purpose.¹¹

There is the stabilization clause in section 125 (6) PIA for holder of a subsisting lease, licence or permit who is engaged in activities in midstream or downstream gas operations prior to the effective date of the PIA shall within 18 months from the effective date apply to the Authority for or to be issued appropriate licence or permit where applicable. This is to show that the legality of the activities in the midstream or downstream sector does not apply to those who had been on the business before the advent of the PIA provided, they apply to the Authority to obtain a licence or permit within 18 months. Section 127 PIA recognizes the right of way for every licensee or permit holder to the place earmarked in the licence or permit to lay pipelines and other facilities necessary to the carrying into effect of the permit or licence. Natural gas can be processed on gas conditioning plants; gas processing plants; gas to liquids plants; liquefied natural gas (LNG) plants; ethane extraction plants; and any other plants requiring processing licence by the Authority.¹² There are again, two regime of licence issuable by the Authority under the PIA; to wit: a licence operating on its own account and one operating on open access basis; which includes the third-party access.¹³

Beside any other conditions that may be imposed by the Authority on natural gas processing under the PIA; what are statutory conditions included that: open access licensee should not operate or carry on activities as though it is own account licence; licensees of gas conditioning plant or gas processing plant are not exempt from affiliating with other companies provided they respect any third party agreement; whatever licence or permit a person or body holds, they are expected to respect third party access to wholesale or distribution or processing of natural gas; holder of licence or permit should carry on with his activities in line with law, regulations on health, safety, environmental protection, management and restoration under the PIA or any other law in force in Nigeria; and, a holder should mark, maintain and secure boundaries of its facilities.¹⁴

A group or individual can be licenced for build storage of natural gas under section 132 PIA. The requirements to be complied with by an applicant for bulk storage licence included: procedure and terms for obtaining third party access or open access; method of response to the request for its services; provide that its facilities would be operated in a safe, reliable, economic and environmentally sustainable manner; will shut down for emergency or maintenance purposes; allow competition even when operating own account licence; consult with the Authority for modifications or change on technical and operational rule of practices; operate on non-discriminatory basis; manage facilities reasonably and prudently; and, ensure, competition.¹⁵

Section 135 PIA provided for gas transportation licence issuable by the Authority to the licensee to exclusively own, construct, operate and maintain a gas transportation pipeline within a defined route for its own account with third party access provisions or a common carrier.¹⁶ The intention here is for a third-party access to be guaranteed whether the transportation licence is for its own account or for common carrier. The use to which the end user would put the natural gas transported would determine whether or not the Authority would grant the licence. The general duties or obligations of a transportation pipeline owner include: procedure for obtaining and terminating transmission and interconnection services for natural gas on a third party access or open access basis;¹⁷ in recognition of the strategic plans formulated by the Authority, a natural gas transportation licensee should construct, operate and maintain its gas transportation pipeline in a safe, economical and reliable manner, endeavour to meet contractual transportation volumes; shut down for emergency or maintenance; provide non-discriminatory access where licence is on common carrier basis; for any form of modification of technical or operational rule, permission had to be sort and obtained from the Authority; and, among others, be prudent and reasonable in gas transportation management. The duties and obligations of the transportation network operator is as stated in sections 138 & 139 PIA, similar to the those of the gas transportation licensee or holder.

The Powers of the Transportation Network Operator may be granted by the Authority to facilitate the conduct of the licenced activities to wit: request and obtain from shippers, information required to operate the nominations and balancing mechanism, to operate the network or to facilitate competition;¹⁸ the holder of the licence has the right to recover reasonable expenses, invoices incurred under the licenced activities;¹⁹ and, a gas transportation licensee cannot (by the Petroleum Industry Act, 2021) supply natural gas to customers, the holder can only purchase natural gas for testing or commissioning of facilities, compression or line fill.²⁰ There are statutory conditions applicable on the licence for gas transportation network operator. In that licence, there should be market rules akin to the one issued by the electricity regulatory body, it is supposed to be annexed to the licence and known to the licensee from the beginning.²¹ A gas transportation network operator may own a gas transportation pipelines in a gas transportation network. Where a third party is an owner of gas transportation network, he or it shall be paid a tariff determined by the Authority for a gas transportation network operator.²²

A wholesale gas supply licence is issuable to a qualified person under section 142 (1) PIA 2021. The essence for the inclusion of the condition for 'qualified person' is not unconnected with the decision of the Court in the case of *Banjo v Abeokuta Urban District Council*²³ where unqualified rights was granted citizens who fulfilled certain conditions of payment of fee and completes designated forms. Here, under section 142, the applicant has to be qualified in the view of the Authority and just that he/it had fulfilled some financial obligation or completed designated forms.²⁴ The section provides for who a qualified person is. For example, it provided that a lessee producing natural gas is a qualified person for the purposes of wholesale gas supply licence.²⁵

The content of a wholesale gas supply licence authorizes the supplier to purchase natural gas directly from any lessee or third party; and, sell and deliver wholesale gas to wholesale customers and gas distributors at any location in Nigeria. The jurisdiction of the wholesale gas supply licence does not extend beyond the shores of Nigeria.²⁶ The obligations of a wholesale gas supply licensee include: enter into a wholesale purchaser and seller agreement with a customer; and, ensure competition.²⁷ Following the duties of a wholesale gas supplier, there are rights which accrued to him/it under the PIA which include the right to: terminate wholesale gas supply agreement or contract with a wholesale customer in event of non-payment after due notice; recover invoices, charges, cost reasonably incurred; and, enter a premises for reading of meters, testing and maintaining metering equipment, disconnect customer or remove the meters.²⁸ The Authority can authorize the retail licence for supply of compressed natural gas; such grant can authorize to sell or retail compressed or liquefied marketable natural gas; establish, construct and operate facilities to deliver compressed natural gas and small scale facilities for LNG not requiring gas processing licence.²⁹ Producers of natural gas are automatically qualified to be issued with or granted gas retail licence.³⁰ Duties of a gas retailer includes: develop and maintain a safe, efficient, reliable and economical service for the retailing of marketable natural gas; carry on its business to promote completion and avoid monopoly; construct gas compression and liquefied facilities in a safe, economical, and reliable manner; shut down for emergency or maintenance; conduct its activities in an environmentally, health and safety related manner prescribed by the Authority; publish prices; and, comply with customer protection measures.³¹

There is the gas distribution licence;³² they have the duties to develop and maintain an economical gas distribution network, ensure efficient and reliable distribution of natural gas to customers, distribute and sell natural gas to a customer who is willing to buy, take in cognizance safety and health issues in their operations;³³ they have the rights to enter premises for reading meters, testing and maintenance; plus, right to recover invoice and costs reasonably incurred.³⁴ The primary condition for gas distribution licence are conducting activities in line with safety and reliable standard; having regards to the effect of the activities on the environment; marking, maintaining and securing boundaries of facilities.³⁵ Arrangements for gas distribution and domestic gas aggregation licence are covered under sections 152 and 153 of the PIA 2021. Functions of the domestic gas aggregator includes: domestic gas delivery obligation; implementation of natural gas management model; operate a nomination and balancing mechanism for natural gas delivery; ensure transparency of

dealing between suppliers and wholesale customers; conduct operations in business-like and transparent manner open to competition.³⁶

A gas aggregator Guarantee Company ought to be established under the CAME for the purposes of coordinating gas purchase order as between producer client and customer client based on their purchase and sale agreement.³⁷ The pricing conditions of gas purchase order shall be as determined by the Authority following consultation with interested stakeholders after the Authority had established categories of customers and eligible wholesale customer and made provisions for the qualifying criteria; it can amend these from time to time.³⁸ The Authority makes arrangement for the trading and settlement of wholesale gas in line with section 159 PIA. The gas network code provided by the Authority guides gas transportation network under section 160; there is access granted under section 161 of the PIA; and the conditions for open access includes: non-discriminatory available capacity, terms and conditions of network code as approved by the Authority; undertaking by participants to abide by the network code and pricing principles.³⁹

Where any disputes arise from third party access, the Authority acts as a mediator under section 163, PIA. Customer's interest is protected under section 164 PIA to the extent of

- i. publication of terms of supply;
- ii. forum for customers to express their views and raise concerns;
- iii. adhere to standards of performance in supply and distribution of services to customers and set penalties for failure to comply;
- iv. prepare and submit reports to the Authority;⁴⁰
- v. develop and adhere to customer service codes, practice and procedures in respect to:
 - a) Installations, testing, maintenance and reading of meters,
 - b) Fault repairs and response to customer emergencies,
 - c) Connection and disconnections of customers,
 - d) Responding to customer complaints and complaint resolution,
 - e) Billing and invoicing,
 - f) Extension of payment and credit facilities
 - g) Provision of information to customer and protection of customer information,
 - h) Services for economically or specially disadvantaged customers⁴¹

The Authority under section 165 PIA can designate distributor of last resort or supplier of last resort to the customer; it can as well transfer a customer pursuant to section 166 PIA. Authority's powers to regulate prices in the gas sector under section 168 and reliance had to the 4th Schedule to the PIA. It does have powers to regulate and review prices pursuant to section 169 PIA; and makes policies in relation to security of supply; environmental protection and health safety under section 171 PIA; it makes for the recovery of cost incurred in complying with the public service obligations through public service levy as set out in a regulation for the purpose; and, fixes domestic gas demand requirement.⁴²

In promulgating a new regime in the petroleum industry, the PIA had made for what is technically called “stabilization”: it allowed existing or subsisting contracts/licenses/leases which were made under former or repealed laws to co-exist with the new regime of Petroleum Prospecting License, Petroleum Exploration License and Petroleum Production Lease. These provisions would allow companies to enjoy their contract as though the repealed laws were still in operation and if there arose any question of law or fact; such would be answered on the basis on the supposed repealed laws and not under the PIA. This is the reason, among others, this paper discussed some of those laws as part of the legal regime for gas utilisation even though there is the PIA 2021.

Associated Gas Re-Injection Act (AGRA) 1979

The AGRA is an eight sections legislation to compel every company producing oil and gas in Nigeria to submit preliminary programmes for gas re-injection and detailed plans for implementation of gas re-injection.⁴³ The designation of each section is brought up here for clearer appraisal and understanding of the Act with respect to gas utilization and consumption in Nigeria. Section - 1 – this section is titled “Duty to submit preliminary programme for gas re-injection.” Section 1 has paragraphs a&b. Paragraph (a) talks about “schemes for the viable utilization of all associated gas”. The emphasis is mine to draw attention that the Act, to the extent of section 1[a] is aimed at gas utilization in the Country. Whether the viable gas is produced in a field or groups of fields? Wherever the oil is produced, if it is discovered, as it is often the case, that gas is associated with such production field, a scheme for the viable utilization of all associated gas produced was to be sent to the Minister not later than 1 April 1980. The simple implication is that the section of the Act applied first to existing companies who have fields or groups of fields. These companies were mandated to submit schemes for viable utilization. Section 1 (b) AGRA is to the effect that where viable utilization of all associated gas produced was not feasible, then and only then can a company, not later than 1 April 1980 submit to the Minister project or projects to re-inject all gas produced in association with oil but not utilized in an industrial project. If one adopts the literal meaning to interpret this provision of the law, one would say that all associated gas shall be re-injected.

I checked quickly to see what re-inject used in section 1(b) meant but was disappointed to note that the Act did not define what it meant by 're-inject'. Section - 2 – this section is titled 'Duty to submit detailed plans for implementation of gas re-injection' emphasis is mine. The section has two sub-sections. Section 2(1) provided for every oil and gas company to submit to the Minister, not later than 1 October, 1980 detailed programmes and plans for implementation of programmes relating to the re-injection of all produced associated gas or schemes for viable utilization of all produced associated gas. The operative word here is detailed programmes and plans relating to the re-injection of all produced associated gas or schemes for viable utilization of all produced associated gas. The section is for gas re-injection or utilization.

A combined analysis of sections 1 and 2 of AGRA will show that by April 1980 all oil and gas companies in Nigeria should have submitted their preliminary plans for viable utilization or

re-inject all produced associated gas in all fields or groups of fields; and by October 1980, detailed programmes and plans for implementing re-injection and utilization of all produced associated gas shall have been submitted to the Minister.

Gas utilization and re-injection is covered in these sections aforementioned. Gas utilization will mean the uses to which gas is utilized as a raw material or means of production; it extends to the marketing and distribution of gas to the end users. Re-injection will mean putting back into the underground gas for storage for future use or as a means to increase pressure for production activities. Gas utilization includes as a raw material for thermals electric power plants, fertilizer plants, feedstock for petrochemical industries, gas to liquid etc. It is economical to re-inject into the underground all associated gas produced during a period when prices are not favourable to the gas market and inject them when the gas market becomes favourable again. Re-injection can also serve as a means to attaining the required pressure for a particular production activity. This paper had pointed out earlier the economic benefits for utilization of gas produced in association with oil. The realities of these economic reasons for gas utilization are with us now than ever in the time and period the Act was enacted.

Section – 3 – this section has two sub-sections and a proviso. Section 3 [1] provided that companies engaged in oil and gas shall not flare gas from January 1984 without the permission of the Minister given in writing. It follows that it is only the Minister that can permit or authorize gas flaring. The flaring of associated gas was permissible under the authority of the Minister. The sections so far examined deals with associated gas. Does it mean that non-associated gas could not be flared by the simple principle that 'the express mention of a thing is the exclusion of the other?' If the Minister is empowered to authorize the flare of associated gas; his powers seems restricted by the Act to the authorization for associated gas flare and nothing more. Section 3(1) is made subject to sub-section 2 of section 3. It means that the powers of the Minister to permit flare of associated gas are made subject to section 3(2) AGRA.

Section 3(2) provides that 'where the Minister is satisfied' that utilization or re-injection is not appropriate or feasible, he may issue a certificate to the oil and gas company: specifying terms and conditions for continued flaring of gas; or permit continued gas flare if the company pays such sum as the Minister may from time to time prescribe for every 28.317 Standard cubic metre of gas flared. Payments for flare gas are made in the same manner as payments for Royalties.

What the Minister must be satisfied by is not mentioned in the Act. The yardstick for measuring what standards by which the Minister shall be satisfied to authorize this killer activity of gas flaring needs to be determined. Sections 1 & 2 should be considered in determining what the Minister should be satisfied by. He should be satisfied with both the preliminary and detailed programmes and plans plus the schemes of gas utilization and or re-injection submitted by the company. What is appropriate or feasible should be objective relying on modern technologies for gas utilization and re-injection and practices of these

companies at their parent countries as well as consideration of international acceptable best practices in the gas sector. What satisfies the Minister should not be based on money to his pockets or political considerations. The exercise of this kind of discretion that will eventually reduce life expectancy of citizenry and deplete the environment should be done judicially and judiciously. It should not be a discretion exercised to victimize a region of the Country by depleting their sources of livelihood and sustainability. It should be an exercise for the best good of the majority of the peoples of the country.

Section 4 is titled Penalty. It is the penalty section for violation of provisions of section 3. It prescribes forfeiture of concessions granted and or withholding of all or part of any entitlements of the offending person/company. Multinational companies engaged in oil and gas production in the Country are rich and have the maneuvering tendencies to influence anyone it thinks could act in a detrimental manner to its interest in the oil and gas sector in the Country. It would therefore, require a strong institution equipped with modern technologies and specialized personnel who are knowledgeable in oil and gas operations to enforce these penalties. Integrity and honour in service to the nation must supersede greed for wealth and unexplained affluence in those who man the regulatory institution for concessions granted to be forfeited or entitlements of such companies withheld in whole or part. Section – 5 – this section empowered the Minister to make regulation for things required in the cause of executing the Act. Section – 6 – makes the Act applicable to Exclusive Zone as defined in the Petroleum Act. Section – 7 – is the interpretation section. Section – 8 – is the short title.

Nigerian Gas Flare Commercialization Programme 2019

The programme warehoused all gas flare programmes in Nigeria and provides for gas utilization as much as practicable. It defined gas utilization as “*the marketing and distribution of natural gas for commercial purpose and includes power plant, liquefied natural gas, gas to liquid, fertilizer plant, gas transmission and distribution pipelines.*” It discussed the fiscal terms affecting gas commercialization in Nigeria and the provisions for tax reliefs and other incentives geared at efficient gas utilization in the country. It provided for one of the best international standards and methods for gas commercialization but administrative steadfastness in implementation for the aims to abound to all Nigerians.

Flare Gas (Prevention of Waste and Pollution) Regulations 2018

The purposes for the regulation were to reduce negative environmental and social impact of gas flaring and thereby protect the environment, prevent waste of exhaustible natural resources and create socio-economic benefits from gas utilization. It also placed ownership of flare gas in the federal government and not on the producers. The Federal Government in that regulation had devised bidding patterns for the flare gas as a way for commercializing flare gas and reduced penalty for producers who have contracted for flare gas in their fields.

Areas of Gas Utilization

Some of the areas where gas utilization Emmanuel (2015) is prominent in Nigeria include: liquefied natural gas; independent power plant; gas to liquid conversion; natural gas liquid; and, feedstock for petrochemicals. Achieving gas utilization in Nigeria is capital intensive⁴⁴

and involves a lot of expertise and deployment of technology and predetermined technical know-how. Abreast with the cost of gas production the Government of Nigeria introduced fiscal incentives for the gas industry to drive utilization and sustainability of gas for efficient economic, social, infrastructural development and environment protection. For these reasons, all Capital Cost of upstream gas investments like exploration, analysis, development and production to the custody transfer point, are treated as gas investments by the production sharing contracts and the resulting capital allowances are deducted from Petroleum Profit Tax (PPT) at a marginal rate of 85%. The production at the upstream on gas transferred to the downstream project is exempted from payment of royalty and PPT. Liquefied Natural Gas (LNG) project receives 10 years tax holiday to encourage more investment on the sector to enhance gas utilization in the Country. It is reported that the LNG project is exempted from withholding tax on interest and dividends paid to non-residents and from income tax on work or services provided by non-residents. The services provided by the non-residents must be such as are not available or indigenously sourced. Otherwise, such waiver on tax though intended to provide technical know-how and make for technological expertise transfer, would be contrary to the nations local content laws. There are also additional investment allowances of 20% and 35% for upstream project and natural gas liquid (NGL) extraction, gas to liquid facilities respectively and 15% for downstream projects. The disparity in incentive should reflect the intension of the local content laws and policies/regulations tailored towards advancing area where Nigerians participate more the entire gas utilization process. The downstream receives capital allowances of 90% of cost of plant and machinery expenditure in the first year with 10% retention. It is suggested that 5 years capital allowances be given to the midstream and downstream sectors of the gas industry to see to a speedy improvements and sustainable investment in the industry be Nigerians who participate mainly at the midstream and downstream sectors.

New Flare Capture Technologies

Technologies that reduce gas flaring will assist energy development in the sector and become much gain for the environment. Capture and utilization technologies for associated gas are encouraged in the national gas policy but not institutional frame work was provided therein to ensure this. Some of the new capture technologies include: power generation projects designed to utilize flared gas; replacing diesel fuel with gas for power generation with small gas engines; combining new processing systems with efficient fuel flexible gas turbines; small-scale GTL or mini-LNG plants; gas infrastructure (processing and transportation) solutions; and, identifying and designing the full value chain for gas supply, including gas gathering pipelines, to connect different small-and large-size flaring fields.⁴⁵

Gas flare penalty may be an incentive for flaring or can become a de-incentive to de-incentivise the practice of flaring where the penalty is calculated to reflect the worth or value of utilization of such associated gas or its reinjection.⁴⁶ Where penalty for flaring is commercially viable for operators in the sector, the desire for cleaner energy and utilization will be a mirage and unrealizable. Therefore, measures by way of laws and regulations, policies and institutions as well as the masses participation had to be ensured and encouraged. The government and her institution (including a department of gas utilization) must endeavour on areas of technology

acquisition on vital areas like determining the quantum of flares in a quarter, measuring the quantity and quality of associated gas at the field(s) and local treatment plants and facilities for complete utilization of the natural gas and natural gas products.

The Department for gas utilization should coordinate the incorporated companies in the sector; company for gas processing and transportation as well as the marketing company should be manned by the Department for gas utilization under the Nigerian National Petroleum Corporation. The creation or establishment of this Department would enable specialized expertise and technology transfer, gas development that is commercially viable, enhance tax revenues for the government and employment of both skilled and unskilled labour. The Department must be cleared from ambiguity and externalities of politics and bureaucracy. Focus must be on international best practices, recent scientific discoveries and model technology in gas utilization, international and national partnerships, private sector profit driven investment and, environmentally friendly laws and policy/regulations by the government and their corporations. There are types of gas utilization agreements, some of which are mentioned as follows:

- a) Gas Supply Agreement – This is an agreement between Flare Gas Buyer and Seller; this is done after permit is granted for access flare gas and commercial agreement had been entered.
- b) Milestone Development Agreement – this is a form of financial guarantee by a bidder to the federal government that it commits to implement a milestone project.
- c) Connection Agreement – this is an agreement between Producer and Buyer on flare gas connection assets so that liability, responsibility and profit is predetermined and ascertained in the contract at the custody transfer point or delivery point.
- d) Deliver-or-Pay Agreement – this is an agreement between Producer and Buyer where the Producer guarantees flare gas delivery on predetermined quantity and composition range.⁴⁷

Nigeria Gas Flare Commercialization Programme 2019

The Nigeria Gas Flare Commercialization Programme 2019 was born out of the Federal Government commitment to the World Bank's Zero Routine Flaring Reduction by 2030. The whole intension is to reduce as much as practicable the flaring of gas at production fields where reinjection or utilization on site or distributed to available markets is not practicable. It recognizes that gas utilization depends on structured infrastructure to target markets and willingness to invest on pipelines and other flare capture technologies deployed by civilized nations is keen in the utilization move in the gas sector. The commitment on the National Gas Policy therefore, is to end gas flaring in year 2030, create investors friendly environment, enable value addition to gas and focus attention on prudent management of the sector for the government.

Flare Gas (Prevention of Waste and Pollution) Regulations 2018

The President of Nigeria acting as the minister of petroleum in July 2018 signed this regulation

in law and its objectives/principles included to: create benefits from gas utilization, protect the environment, prevent waste of natural gas resources and reduce negative environmental and social impact of flaring associated natural gas; charge producers flare fees for each thousand standard cubic feet flared whether flaring is routine or not; apply the sovereign right over natural resources by owing the flare gas; and, Petroleum Minister permits the taking of flare gas by companies other than the producer company on the behalf of the federal government

The fear of loss of funds from ending gas flaring is the reason the government do allow continued flaring of gas instead of putting an end to it and allowing full gas utilization by producers or nothing else. Principle 1 on the Regulation outlined the dangers and harms associated to gas flaring both environment and social, human health and genetic alteration of flora. Flare gas is a waste of exhaustible natural resources and deprived government of revenues and social services potentials embedded in the productive utilization of gas resources. principles 2 & 3 is a show of weakness in government leadership and lack of political will to end this statutory economic sabotage that has led to crisis in the Niger Delta and contributed to global warming and ozone depletion. It is robbing the citizens their health and reducing life expectancy, causing desertification and deforestation, contaminating fresh water sources and depleting natural aesthetic sites. The disadvantage of gas flaring is not only challenging the right to life enshrined in the 1999 constitution; it is a show of childishness for a nation with potential billions of Dollars from gas utilization to borrow her future generation to foreign loans while permitting gas flare.

Gas Utilization Projects in Nigeria

Gas Utilization Projects in Nigeria drawn from Nigeria National Gas Policy and other literature reviewed included: The Nigeria LNG (NLNG) worth 3.8 billion dollars (expected to produce in 2011 22mmt); Escravos Gas-Gathering Project (to come on stream 2009); Calabar-Ajaokuta Pipeline (CAP) Project; Oso NLG Project (to come on stream 2015); Oso 2Y2 Project; Oso platform to QIT Pipeline Project; Ok LNG Project (projected to come on stream 2016); West African Gas Pipeline Project; Trans-Saharan Gas Pipeline; Nnwa-doro Floating LNG Project; Bonny LNG Project; Ekpe Gas Compression Projects; Belema Gas Injection Project; Odigbo Node Gas Project; Cawthorne Channel Gas Injection Project; Train 7 project; Erha/BosiPipeline Project, Ajaokuta-Kaduna-Kano (AKK) Pipeline Project, Obiafu-Obrikom-Oben (OB3) Pipeline Project; and, Aba-Owerri-Nnewi-Onitsha Pipeline Project.

The intension was to build gas utilization facilities within and outside Nigeria. Many of the projects have reached advanced stage and some are being sabotaged by vandalism and communal conflicts. The West African Gas Pipeline was intended to convey gas product across West Africa but the pipeline had been riddled with vastly over-costed infrastructure, shortage of supplies from the Nigerian side, payment defaults by some WAGP customers and vandalism in Nigeria.⁴⁸ Under the Trans-Saharan Gas Pipeline, it was routed from Nigeria to Niger and Algeria with the intendment to capture more market for gas. MOUs were signed among Nigeria, Niger and Algeria. Nigeria, by this project, is supposed to generate internal

distribution networks for gas utilization from the corridor of the eastern to the northern part of the Country where there are population of people for utilization purposes. National gas utilization includes for Petrochemical plants, fertilizer plants, village power plants, embedded power plants. There are possibilities for Natural Gas Vehicles in Nigeria where compressed natural gas are used for special vehicular operation; Gas for Rail Electrification to supply energy requirements for rail transportation and Liquefied Natural Gas Trucks. Compressed Natural Gas can be a means or alternative to deploying pipelines in the transportation of gas products. This alternative is important to safeguard the environment and prevent vandalism and other economic sabotage associated with pipeline transportation of gas products. Compressed Natural Gas can be transported by road, air or waters. Liquefied Petroleum Gas is sometimes a 50% by 50% combination of propane and butane produced from refining crude oil or processing natural gas. LPG is a source of clean energy and better substitute for wood fuel and charcoal. It is one means of natural gas usage known world over, the more production of LPG, the more the ripple effect for good on the economy in terms of production of cylinders, retails agents and other service providers in the distribution lines. LPG is useful for domestic, power generation, auto-gas and industrial purposes.

Conclusion

The extant laws on gas utilization are not making economic sense. They are neither socially viable nor environmentally sustainable especially in the face of depletion of the ozone and global warming. Institutions should be established specifically for gas utilization and manned by professional, especially lawyers who understand the needs of the society and the environmental implications of gas utilization. With the above on ground, it is hoped that Nigeria will run a gas utilization driven economy for the betterment of the present and future generations.

Reference

Africa Oil and Gas Report (2008). Nigeria's national domestic gas supply and pricing policy, <<https://africaoilgasreport.com/2008/04/gas-monetization/nigerias-national-domestic-gas-supply-and-pricing-policy/#:~:text=The%20gas%20pricing%20framework%20stipulates,mcf%20for%20the%20commercial%20sectors.>> accessed 23 July 2021.

Aliyu, D. A. (2021). Developing Nigeria's gas industry for the domestic market, *Daily Trust Newspaper of Friday*.

Barnes, J. (2006). Et al "Introduction to the study in natural gas and geopolitics from 1970 to 2040" in D.G Victor and A.M. Jaffe and M.D. Hayes (Eds) Cambridge University Press

Buford B. P. (2019). The Impact of the Interference of Regulatory Jurisdictional issues on the Life Cycle of Natural Gas Pipelines in the United States of America. *Oil, Gas & Energy Law Intelligence*.

- Department of Petroleum Resources, Guidelines for Flare Payments (2018).
- Department of Petroleum Resources, Nigeria National Gas Policy (2017). p. 17, 18.
- Dike S.C, ((2015). Analysing the roles and operations of key participants in the Nigerian petroleum industry and their impact in promoting energy security. *International Energy Law Review*
- Dimitroff, T. J. ((2019). Introduction – OGEL Special Issue on Natural Gas Pipeline Construction and Regulation. *Oil, Gas & Energy Law Intelligence*
- Ehirim, O. E. (2021). Towards Effective Domestic Natural Gas Utilization in Nigeria” *International Journal of Engineering and Modern Technology* (2018) [4][3].
- Emmanuel, E. O. (2019). Towards Effective Domestic Natural Gas Utilization in Nigeria. *International Journal of Engineering and Modern Technology*, 4 (3) 99-103.
- INEC v Musa (2003). 3 NWLR (Pt.806) 72 SC.
- Nigeria Gas Flare Commercialization Programme (2017). p. 25-27.
- Nigeria Gas Flare Commercialization Programme (2019). p. 15.
- Nigeria National Gas Policy (2017). p. 70.
- Nigeria National Gas Policy (2017). p. 62.
- Nigeria National Gas Policy (2017). p. 63.
- Occhiali G. & Falchetta G. (2018). *The Changing Role of Natural Gas in Nigeria: A Policy outlook for energy security and sustainable development*. Working Paper, No. 010, Fondazione Eni Enrico Mattei (FEEM) Milano 10.
- Ojide M. G. ((2012). Impact of Gas Industry on Sustainable Economy in Nigeria: Further Estimations Through Eview. *Journal of Applied Sciences*, 2244-2251.
- Onolemhemen, R.U. *et al* (2017). An Evaluation of Domestic Gas Utilization on the Nigerian Economy. *British Journal of Economics Management and Trade*, 1 (1), 2.
- Oyedepo, S. O. (2012). Energy and sustainable development in Nigeria: the way forward. *Energy, Sustainability and Society: A Sprinter Open Journal*, 1.

Preamble to AGRA 1979.

Section 125 (4) PIA 2021.

Section 125(2)PIA 2021.

Section 129 (1)(a-f) PIA 2021.

Section 129(2) PIA 2021.

Section 131 (a,b) PIA 2021.

Section 131 PIA 2021.

Section 133 PIA 2021.

Section 135(1)PIA 2021.

Section 136(a)(i)PIA 2021.

Section 140 (a)PIA 2021.

Section 140 (b)PIA 2021.

Section 140 (c) PIA 2021.

Section 141 (1-3)PIA 2021.

Section 141 PIA 2021.

Section 142(1)PIA 2021.

Section 142(2)PIA 2021.

Section 142(3)(a-b)PIA 2021.

Section 143 PIA 2021.

Section 144 (a-c)PIA 2021.

Section 146 (1)(a,b)PIA 2021.

Section 146 (2) PIA 2021.

Section 147 (a-d) PIA 2021.

Section 148 PIA 2021.

Section 149 (a-g) PIA 2021.

Section 150 (a&b) PIA 2021.

Section 151 (a-c) PIA 2021.

Section 154 (1)(a - e) PIA 2021.

Section 162 PIA 2021.

Section 164 (1)(a-d) PIA 2021.

Section 164 (1)(e, i-viii) PIA 2021.

Section 39, Companies Income Tax Act.

Section 6 and section 7 (c)(i&ii) PIA 2021.

Section 7 (c) PIA 2021.

Sections 155 & 156 PIA 2021.

Sections 157 & 158 PIA 2021.

Sections 172 & 173 PIA 2021.

Sections 31&32 PIA 2021.

Social and Economic Rights Action Centre (SERAC) and Centre for Economic and Social Rights (CESR) v. The Federal Republic of Nigeria (Communication 155/96, October 27, 2001).

The meaning of Gas Utilization given in Clarification of Terms is according to Nigeria Gas Flare Commercialization Programme (2019).

World Proved Gas Reserves Ranking (2015).