

## Short Paper

# The Nigerian Petroleum Industry Act, Frontier Basins

## Exploration and the Global Energy Transition

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### **Abstract**

*The Nigerian Petroleum Industry Act (PIA) passed into Law in 2021 has the major goal to reform the Nigerian petroleum sector operations into policy, regulations and business (commercial). In the line of this, the Nigerian National Petroleum Corporation (NNPC) was transformed to NNPC Ltd to operate entirely commercially with a supervising Board and registration with the Corporate Affairs Commission. Such a commercial mandate will entail the need to explore and produce more oil and gas for export and domestic utilization. Oil is becoming less attractive as an energy source but gas is gaining momentum as a clean energy source in the global energy transition road-map. The global energy transition road-map is drawn around clean, alternative and renewable energies. The Nigerian frontier basins have recently come on board as new business opportunities with huge petroleum gas resources. These frontier basins comprise the Anambra, Benue, Bida, Chad (Nigerian sector), Dahomey, and Sokoto Basins as well as the Deep and Ultra-deep offshore. Maturing these basins through data generation and production of the gas resources therein will promote the nation's gas utilization and gas expansion programmes meant to promote industrialization and huge employment generation, grow the economy and engender positive social transformation. The clause in the PIA that promotes frontier exploration is well-thought out. Available and required geological data needed to mature the frontier basins to producing basins are presented in this paper. The success made in Kolmani River-2 well discovery is a case study.*

**Keywords**

*Nigeria PIA, Energy Transition, Frontier Basins, Alternative Energy*

**1. Introduction**

The recent passing into Law of the Nigerian Petroleum Industry Act has a bearing on the ongoing exploration by the Nigerian National Petroleum Corporation (NNPC) which in turn allows juxtaposition by the present global energy transition that demands deployment of renewable and alternative clean energies. Economic growth in any society is anchored on the productive activities of the real sector whose performance is driven by energy availability. The level of economic development equally determines the human development indices such that in the African region, poor industrial performance resulting from gross energy deficit have resulted in stunted economic growth, high unemployment figures, and the resultant high poverty level, recurring political crises and youth restiveness. It is a recognized fact that availability and access to energy is a sine qua non for achieving industrialization in any country. Asides from the huge impact of the energy sector on employment generation, it also acts as catalyst for sustainable development and enhances resource efficiency. Indeed, energy is the “oxygen” of the global economy and the life-blood of growth in any nation. This paper has reviewed the relationship between the Petroleum Act, Nigeria’s frontier basins and the global energy transition and the meaning to the country’s economic development in a sustainable physical environment.

**2. Methods of Study**

This paper is generally a review of existing information and data, taken mainly from the Nigerian Petroleum Industry Act (2021) and the works of Obaje et al. (2004) and Obaje (2009).

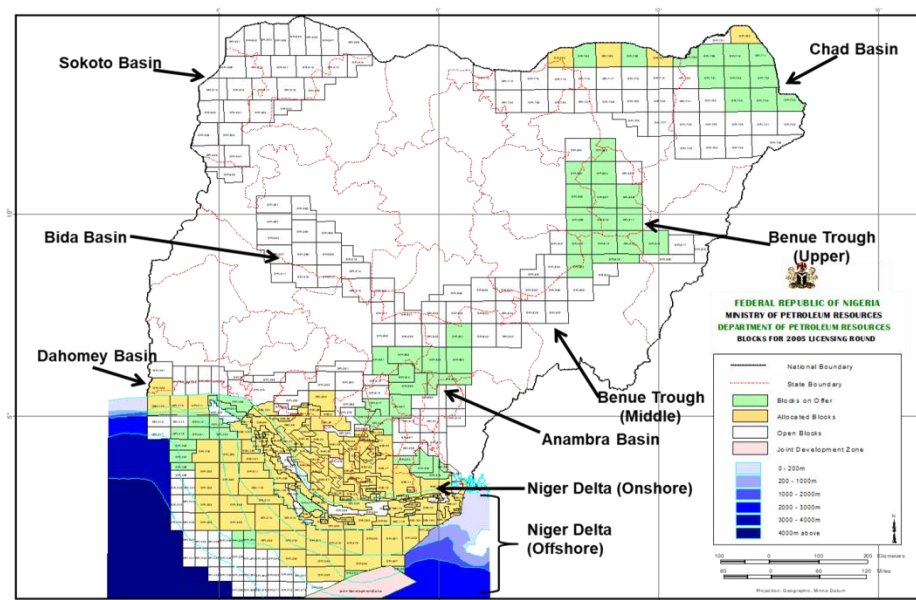
**3. Results and Discussion****3.1 The Nigerian Petroleum Industry Act**

The key attributes of the Nigerian Petroleum Industry Act passed into Law in July 2021 embrace the creation of governance structures to ensure good governance and accountability, thereby ensuring a commercially oriented national petroleum company that fosters conducive business environments for petroleum operations. In the line of this, the Nigerian Upstream Regulatory Commission responsible for the technical and commercial regulation of the upstream petroleum operations; and the Nigerian Midstream and Downstream Petroleum Regulatory Authority responsible for the technical and commercial regulation of the midstream and downstream operations have been created. The Commission and Authority are exempted from the provisions of any enactment relating to the taxation of companies or Trust Funds. The Nigerian National Petroleum Corporation (NNPC) has been incorporated as a commercial and profit focused NNPC Limited with ownership vested in the Ministry of Finance Incorporated (and Ministry of Petroleum Incorporated) on behalf of the Federation to take over assets, interests and liabilities of NNPC. This structure is expected to pave the way for eventually sale of shares

to Nigerians. NNPC Limited will earn 10% of proceeds of the sale of profit oil and profit gas as management fee while 30% will be remitted to Frontier Exploration Fund for the development of frontier acreages in addition to 10% of rents on petroleum prospecting licences and mining leases.

### 3.2 Frontier Basins

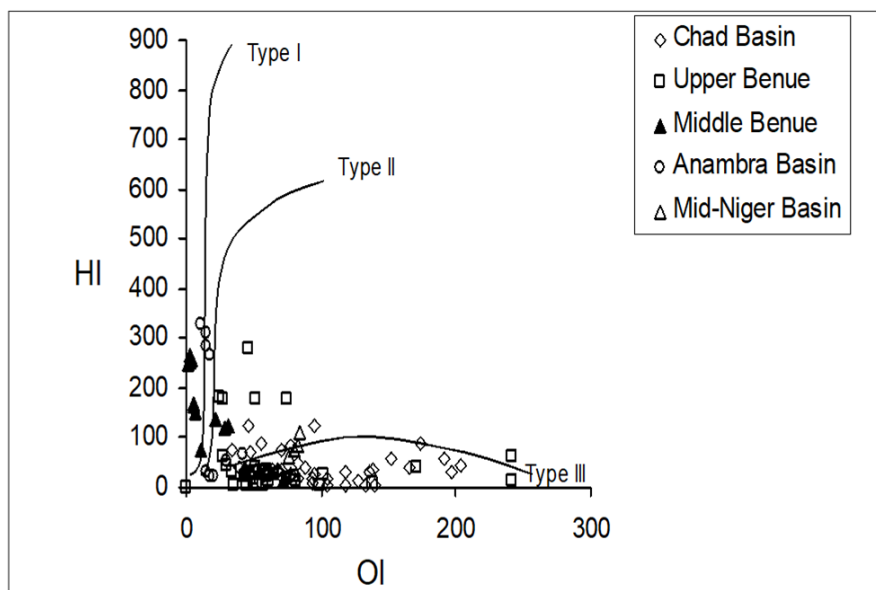
The clause enabling the NNPC Limited to remit 30% profit to the Frontier Exploration Fund attests to the desire of the Nigerian government to harness the resource opportunities in the frontier basins. Frontier basins are those sedimentary basins that are generally considered high-risk and under-explored and on which only scanty data are available. In Nigeria, these basins comprise deep and ultra-deep offshore Niger Delta, and the intracratonic inland sedimentary basins embracing the Anambra Basin, Benue Trough, Bida Basin, Chad Basin, Dahomey Basin and Sokoto Basin. Outside some portions in the Anambra and Dahomey Basins where some acreages have been concessionaired to Orient Petroleum (Anambra Basin) and Yinka Folawiyo Petroleum (Dahomey Basin), all of the remaining frontier basins are open acreages (Figure 1). Evaluation of potential petroleum systems and hydrocarbon proneness by previous workers indicate that Nigerian frontier basins constitute a huge storage of natural gas and indeed with estimated 75% natural gas to 25% crude oil in volumetric ratio (Obaje et al., 2004). The exploration success through the commercial discovery with Kolmani River-2 well drilled by the NNPC is a classical attestation.



**Figure 1. Delineated Blocks in Nigeria's Sedimentary Basins Showing Allocated Acreages, Acreages on Offer and Open Acreages (Courtesy of defunct DPR)**

### 3.3 Global Energy Transition

The energy transition is a pathway toward transformation of the global energy sector from fossil-based to zero-carbon by the second half of the present century. At its heart is the need to reduce energy-related CO<sub>2</sub> emissions to limit climate change. Decarbonisation of the energy sector requires urgent action on a global scale, and while a global energy transition is underway, further action is needed to reduce carbon emissions and mitigate the effects of climate change. Renewable (solar, wind, biomass) and alternative clean energy (natural gas) sources therefore constitute the fulcra for the global energy transition. Data generated over the years show that Nigerian frontier basins constitute huge storage of unproven natural gas and some oil. Exploring and exploiting these natural gas resources align with the current global energy transition to cleaner energies of which natural gas is a big player therein. Exploiting the natural gas resources will propel the drive towards a greener economy with the concomitant industrialization and employment generation. Dismissed as a useless by-product of crude oil production until the second half of the 20th century, natural gas now accounts for 24 percent of the world's energy consumption (IEA 2016). And the demand is growing. An environmentally-friendly and efficient energy source, natural gas is the cleanest-burning conventional fuel, producing lower levels of greenhouse gas emissions than heavier hydrocarbon fuels such as coal and oil. Historically, natural gas also has been one of the most economical energy sources. Natural gas fuels electric power generators, heats buildings and is used as a raw material in many consumer products, such as those made of traditional plastics. The International Energy Agency predicts that the demand for natural gas will grow by approximately 43 percent through 2035.



**Figure 2. Van Krevelen Diagram Plot of Hydrogen Index Against Oxygen Index Values of Frontier Basins Samples Studies by Obaje et al. (2004) and Obaje (2009) Showing That Hydrocarbon Resources in Nigeria's Frontier Basins Are Overwhelmingly Gas**

#### 4. Conclusions

The Nigerian Petroleum Industry Act (PIA) (2021) is the law guiding and driving operations of the oil and gas industry in Nigeria currently. It has the major goal to reform the Nigerian petroleum sector operations into policy, regulations and business/commercial. To this extent, state-owned company, the Nigerian National Petroleum Corporation (NNPC) has been transmuted into a limited liability company registered with the Corporate Affairs Commission. It has to now operate strictly on commercial basis and to declare dividends to shareholders. Such a commercial mandate will entail the need to explore and produce more oil and gas for export and domestic utilization. With global energy transition, oil is becoming less attractive as an energy source but gas is gaining momentum as a clean energy. The global energy transition is campaign for decarbonization and net-zero carbon focusing on clean, alternative and renewable energies. The Nigerian frontier basins present business opportunities with huge petroleum gas resources. These frontier basins comprise the Anambra, Benue, Bida, Chad (Nigerian sector), Dahomey, and Sokoto Basins as well as the Deep and Ultra-deep offshore. Maturing these basins through data generation and production of the gas resources therein will promote the nation's gas utilization and gas expansion programmes meant to promote industrialization and huge employment generation, grow the economy and engender positive social transformation. It is noteworthy that is already a clause in the PIA that promotes frontier exploration. This paper has attempted to present available and required geological data needed to mature the frontier basins to producing basins. The Nigerian National Petroleum Corporation has demonstrated this in the Gongola Basin exploration campaigns and the Kolmani River-2 well commercial discovery.

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