

# Fiscal Framework for Gas Field Development in the Era of Decade of Gas

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*Abstract - Nigeria possesses one of the largest proven natural gas reserves in Africa, positioning the sector as a critical driver of economic diversification and energy transition. However, for decades, gas development was constrained by weak regulatory frameworks, fiscal ambiguities, and infrastructure deficits. The enactment of the Petroleum Industry Act (PIA) in 2021 and the introduction of the Gas Fiscal Framework (GFF) in 2024 marked a significant policy shift aimed at improving governance, transparency, and investor confidence in the gas sector. This study critically evaluates the effectiveness of these frameworks in facilitating gas field development within the context of Nigeria's "Decade of Gas" initiative. Using a qualitative research design that integrates documentary analysis, case studies, and expert interviews, the study examines how fiscal incentives, regulatory reforms, and host community provisions influence investment decisions, project viability, and environmental sustainability. Findings reveal that while the PIA and GFF have created a more predictable and investment-friendly environment through reduced royalty rates, tax allowances, and flare reduction measures, challenges persist in the form of bureaucratic inefficiencies, weak enforcement capacity, and infrastructure gaps. The research concludes that the reforms represent a progressive step toward sustainable gas development but require consistent implementation, strengthened regulatory institutions, and transparent community engagement to achieve long-term success. Policy recommendations emphasize the need for fiscal stability, improved domestic pricing mechanisms, and accelerated infrastructure expansion to fully harness Nigeria's gas potential.*

**Keywords:** Petroleum Industry Act (PIA), Gas Fiscal Framework (GFF), Gas Field Development, Energy Transition, Nigeria's Decade of Gas

## I. INTRODUCTION

Nigeria possesses one of the largest proven natural gas reserves in Africa and ranks among the top ten globally, making gas development a vital component of the nation's economic diversification strategy (NUPRC, 2022). For decades, however, the petroleum sector operated under opaque and inefficient regulatory frameworks that discouraged investment and hindered optimal resource utilization

(Omonbude, 2013). Recognizing these limitations, the Federal Government enacted the Petroleum Industry Act (PIA) in 2021, a transformative legislation aimed at improving governance, transparency, and investor confidence (Federal Government of Nigeria, 2021; Deloitte, 2021). Complementing this reform was the Gas Fiscal Framework (GFF) of 2024, which introduced a targeted fiscal structure to promote gas field development, reduce flaring, and encourage domestic utilization (Akinyemi, 2021; MPR, 2021).

The PIA redefined the regulatory, fiscal, and administrative landscape of Nigeria's upstream, midstream, and downstream sectors. It established the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), tasked with ensuring compliance, environmental sustainability, and value creation across the gas value chain (NUPRC, 2022; NMDPRA, 2022). The Act also introduced host community development trusts to foster socio-economic inclusion and reduce disruptions in oil and gas operations (Obi & Omoju, 2020). These provisions were designed to create a business-friendly environment that encourages long-term capital investment, particularly in gas projects, which are capital-intensive and carry significant risks (PwC, 2023; KPMG, 2022).

Aligned with Nigeria's "Decade of Gas" initiative, the GFF provides fiscal incentives such as lower royalty rates, cost recovery mechanisms, and tax allowances tailored for gas development (MPR, 2021; The Africa Report, 2022). These measures aim to reposition Nigeria as a competitive destination for global investors, especially in the context of the energy transition where gas is increasingly viewed as a cleaner bridge fuel (IEA, 2021). The framework also supports the expansion of critical infrastructure, including pipelines, processing plants, and LNG facilities, which are essential for energy security and industrialization (World Bank, 2019).

Despite these reforms, gas field development under the PIA and GFF remains complex. Investors and operators must navigate new licensing procedures, fiscal compliance requirements, environmental regulations, and community engagement protocols (NUPRC, 2022). Uncertainties around implementation, policy consistency, and regulatory capacity raise questions about feasibility and economic viability (Obi & Omoju, 2020). Persistent challenges such as gas flaring, project financing, infrastructure deficits, and alignment with Nigeria's climate commitments further complicate the landscape (World Bank, 2023).

This study therefore critically evaluates the development of gas fields under the PIA and GFF, examining their regulatory, economic, and technical implications. Specifically, it seeks to determine whether these frameworks are effectively facilitating gas field development or whether further policy adjustments are required. The objectives include: examining the key provisions of the PIA and GFF relevant to gas development; assessing their impact on investment decisions, project viability, and operational efficiency; identifying challenges faced by stakeholders; evaluating how the frameworks address issues such as flaring, host community relations, and infrastructure; and providing policy recommendations for improving effectiveness and sustainability (FGN, 2021; NUPRC, 2022).

The scope of the study is limited to Nigeria, with emphasis on onshore and nearshore gas fields due to better data availability, while offshore and frontier regions are referenced but not extensively analyzed (Odusami, 2017). The timeframe covers 2021–2025, from the enactment of the PIA to the introduction of the GFF, excluding downstream gas activities unless directly connected to upstream viability (MPR, 2021).

The significance of this research lies in its contribution to understanding how the PIA and GFF are shaping Nigeria's gas sector. It offers guidance to policymakers in refining implementation strategies, assists investors in navigating the regulatory and fiscal landscape, and informs host communities and civil society on issues of sustainability and equitable resource distribution (NEITI, 2022). Ultimately, the study supports Nigeria's broader goals of economic diversification, energy transition, and sustainable gas

sector growth (IEA, 2019; The Africa Report, 2022).

Nevertheless, the study faces limitations, including restricted availability of long-term data due to the recency of the reforms, limited access to confidential project details, variability in regional implementation, and a narrow focus on onshore and nearshore fields (NUPRC, 2022; DPR, 2020). These constraints highlight the need for cautious interpretation of findings while underscoring the importance of continued research as the frameworks mature.

## 1.2 Literature Review

The global development of the gas industry has been driven by its reputation as the cleanest fossil fuel, emitting approximately 30% less carbon than crude oil and nearly half as much as coal (IEA, 2021). In response to the environmental impacts of hydrocarbons, international frameworks such as the United Nations Sustainable Development Goals (UN, 2015) and the Paris Agreement of 2015 (UNFCCC, 2015) have emphasized carbon neutrality and the reduction of greenhouse gas emissions. Nigeria, as a signatory to these agreements, reinforced its commitment through the enactment of the Petroleum Industry Act (PIA) in 2021, designed to incentivize investment in the gas sector (Deloitte, 2021; NUPRC, 2022).

Global demand for natural gas rose from 176 billion cubic feet per day (BCFD) in 1990 to 255 BCFD in 2006 (BP, 2007). Much of this growth occurred in emerging markets such as Africa, South America, the Middle East, and Asia-Pacific, though traditional regions like Europe, North America, Russia, and the Caspian accounted for more than 46% of global consumption (EIA, 2008). Gas-fired power generation was a major driver, increasing from 53 BCFD in 1990 to 94 BCFD in 2006 at a compound annual growth rate of 3.7% (IEA, 2009). This expansion reflected rising electricity demand, the replacement of aging coal plants, and mounting global pressure to reduce emissions (World Bank, 2019). Consequently, international gas trade grew steadily, with Europe relying on pipeline imports from Russia and LNG supplies, while Asia-Pacific and North America depended primarily on LNG (BP, 2007; GIIGNL, 2006).

In Nigeria, gas utilization began in 1963 when Shell

Petroleum Development Company (SPDC) sold associated gas (AG) to industrial users in Aba (Nwokeji, 2007). To reduce flaring and create value from AG, the government initiated several utilization projects between the mid-1960s and late 1990s, supplying gas to power plants, refineries, steel complexes, fertilizer companies, and smelting industries (Lawal et al., 2016; Akuru & Okoro, 2011). Production increased significantly in the 1970s, exceeding 2.7 billion standard cubic feet per day (BSCF/D) by 1979, and continued to rise, reaching over 8.2 BSCF/D in 2015 (Odusami, 2017). This growth was driven by deeper non-associated gas (NAG) discoveries, offshore developments, NLNG exports, and rising domestic demand for power generation (Ejiogu, 2014; Ogbuigwe, 2018). By 2015, more than 39 companies were engaged in oil and gas production, motivated by flaring reduction, industrialization, and economic growth (Ugochukwu & Ertel, 2008). NLNG, in particular, was instrumental in positioning Nigeria as a global gas player (Iledare, 2015). Despite this progress, challenges persist, including the capital-intensive nature of infrastructure, inappropriate pricing policies, and government distortions (NUPRC, 2022).

The evolution of Nigeria's gas sector can be divided into eras. The first, beginning in 1975, was demand-constrained, characterized by flaring and incentives focused on export projects such as NLNG (Akinyemi, 2020; Nwaoha & Wood, 2014). The second era, from the late 1990s onward, marked rapid monetization through LNG exports, declining flaring, and new gas-to-liquids projects (IEA, 2019). Domestic utilization grew modestly, supported by projects such as the West African Gas Pipeline, Escravos GTL Plant, and Afam VI Power Plant (Okonkwo & Eze, 2022). Producers also used AG for gas-lift, fuel, and reinjection (Adewuyi & Awotunde, 2021). However, the domestic market remained underdeveloped due to IOC dominance and preference for exports, driven by higher returns and income security from international LNG buyers (NEITI, 2022). Estimates suggest unconstrained production could reach 12–13 BCFD under ideal conditions (DPR, 2020). The Nigerian National Petroleum Company (NNPC) Limited, through its subsidiary Nigerian Gas Company, controls domestic supply for power generation and industries such as cement, fertilizer, and manufacturing (MPR, 2021).

Export-oriented projects have been central to Nigeria's gas strategy. The Escravos Gas Project by NNPC/Chevron JV produced LPG for export (Chevron, 2022), while the OSO NGL Project by NNPC/Mobil JV began operations in 1998 (NNPC, 2017). NLNG, in partnership with ELF, AGIP, and Shell, built Nigeria's first LNG plant in Finima, contributing 1 BSCF/D from fields such as Obite, Obiafu, and Soku (NLNG, 2021). Other projects included the Ekpe Gas Compression Project (Eboh, 2009), OSO 2Y2 Project (Okonkwo & Odularu, 2020), Belema Gas Injection Project (Shell, 2021), Odigbo Node Gas Project (Iledare & Suberu, 2010), and Odidi AGG Project feeding into the West African Gas Pipeline (ECOWAS, 2001). Regional cooperation was strengthened through WAGP, initiated under ECOWAS Article 48, linking Nigeria, Ghana, Benin, and Togo (GNPC, 2015). These projects collectively supported Nigeria's flare-out targets and monetization blueprint (Nwokeji, 2007; Iledare & Suberu, 2010).

Nigeria's proven reserves, estimated at 206.53 trillion cubic feet (NUPRC, 2022), remain underutilized due to infrastructure deficits and policy neglect (Akinyemi, 2021; Obi & Omoju, 2020). For decades, government focus on crude oil sidelined gas development (Omonbude, 2013). Recent initiatives, however, such as the "Decade of Gas" (MPR, 2021; The Africa Report, 2022), have sought to reposition gas as a driver of industrialization and energy security. Earlier frameworks, including the National Gas Master Plan (MPR, 2008), the "7 Big Wins" policy (MPR, 2016), and the National Gas Policy (FGN, 2017), laid the foundation for reforms by emphasizing infrastructure, pricing, and private sector participation (Obi & Omoju, 2020).

The Petroleum Industry Act (PIA) of 2021 consolidated these efforts, introducing structural reforms such as the creation of NUPRC and NMDPRA (FGN, 2021; Akinyemi, 2021). It replaced Oil Mining Leases with Petroleum Mining Leases, encouraged Incorporated Joint Ventures, and mandated corporate restructuring (NUPRC, 2022; Obi & Omoju, 2020). In the midstream, the Act empowered NMDPRA to issue Gas Processing and Transportation Licenses (MPR, 2021), while environmental regulation remained under the Federal Ministry of Environment (FRN, 1992). The Nigerian Gas Transportation Network Code (NMDPRA, 2022) further ensured fair access to infrastructure.

Domestic supply was reinforced through the Domestic Gas Delivery Obligation (DGDO), requiring producers to allocate gas annually to designated locations (FGN, 2021; Akinyemi, 2021).

From a fiscal perspective, the PIA operationalized the vision of the National Gas Policy (MPR, 2017), establishing the Midstream and Downstream Gas Infrastructure Fund (MDGIF) to support equity investments in pipelines, processing plants, and storage facilities (NUPRC, 2022). The fund is financed by a levy on petroleum products and gas sales, as well as revenues from flaring penalties (Akinyemi, 2021). Incentives include tax holidays of up to ten years for midstream and downstream operators (FGN, 2021). Collectively, these measures aim to attract private capital, enhance infrastructure, and promote sustainable gas development.

## II. METHODOLOGY

### 2.1 Research Design

This study employs a qualitative and evaluative research design to investigate how Nigeria's Petroleum Industry Act (PIA) of 2021 and the Gas Fiscal Framework (GFF) of 2024 influence gas field development. The design is anchored in policy analysis and case study methodology, combining documentary review with expert perspectives. A document-based approach is complemented by semi-structured interviews and comparative analysis of gas projects before and after the enactment of the PIA and GFF. This integrated approach enables a detailed assessment of fiscal, regulatory, technical, and infrastructural factors shaping gas asset development in Nigeria.

### 2.2 Data Scope

The research focuses on gas field projects initiated or modified within the context of the PIA and GFF. Emphasis is placed on upstream activities such as exploration, appraisal, and production, alongside midstream infrastructure including processing and transportation. Regulatory interventions that directly affect monetization are also examined. Case studies include projects operated by NNPC Limited and its Joint Venture partners, covering both associated and non-associated gas developments.

### 2.3 Data Sources and Collection

#### Secondary Data

- Legislative and Policy Documents: Petroleum Industry Act (2021), Gas Fiscal Framework (2024), National Gas Policy (2017), and related gazettes.
- Regulatory Reports: Publications from NUPRC, NMDPRA, and the Ministry of Petroleum Resources.
- Academic Literature: Peer-reviewed studies (2010–2024) on energy policy, fiscal regimes, natural gas economics, and comparative hydrocarbon governance.
- Industry Reports: Whitepapers and reports from NNPC Ltd, Shell, Chevron, and global institutions such as the World Bank, IMF, and African Development Bank.

#### Primary Data

- Expert Interviews: Five semi-structured interviews with upstream asset managers, gas policy consultants, fiscal regime specialists, and legal practitioners. These provide practical insights into how the PIA and GFF influence project decisions.
- Case Documentation: Comparative review of two major gas field projects—one predating the PIA and one developed under the new framework—focusing on licensing timelines, fiscal obligations, and infrastructure challenges.

### 2.4 Analytical Framework

- Analysis is guided by five dimensions aligned with the study's objectives:
- Regulatory compliance and licensing efficiency
- Fiscal attractiveness and investment decision impact
- Infrastructure availability and constraints
- Environmental safeguards and flaring provisions
- Local content and stakeholder engagement

Thematic analysis is applied to interview transcripts and case study data, with coding conducted using NVivo software. This enables identification of recurring policy barriers, fiscal bottlenecks, and strategic responses by operators.

### 2.5 Evaluation Metrics

- Key indicators used to assess the effectiveness of the PIA and GFF include:
- Time to license approval (months)
- Effective tax rate (%)

- Project payback period (years)
- Volume of gas monetized (MMscf/d), including Domestic Gas Delivery Obligations (DGDOs)
- Reduction in flaring (MMscf/d)
- Degree of local content participation (% of contracts and labor)

### 2.6 Assumptions and Limitations

The study assumes full implementation of the PIA and GFF in their current form, without accounting for potential amendments. It also assumes that publicly available fiscal and project data are accurate representations of real conditions. Limitations include restricted access to proprietary project details, variability in interview responses, and the evolving nature of policy enforcement in Nigeria’s oil and gas sector.

### 2.7 Ethical Considerations

All expert participants were engaged with informed consent, and confidentiality was strictly maintained. The research adheres to institutional ethical guidelines for policy-based and human subject research, ensuring integrity and respect for participants.

## III. RESULTS AND DISCUSSION

### 3.1 Comparative Fiscal Regimes

Prior to the enactment of the PIA and GFF, fiscal provisions governing gas development were largely unfavorable, with hydrocarbon tax applied to both oil and gas, flat royalty rates, and limited incentives for infrastructure investment. The new frameworks introduced significant changes, exempting gas operations from hydrocarbon tax, reducing royalty rates, and offering tax holidays of up to ten years for midstream infrastructure.

Table 3.1: Summary of Oilfield Project Data

Fiscal Element	Pre-PIA/GFF	Post-PIA/GFF	Impact on Investment
Hydrocarbon Tax	Applied to both oil and gas	Exempted for gas operations	Increased investor interest in gas projects
Royalty Rates	5–10% flat	2.5% for domestic gas; 5% offshore	Encourages deep offshore and domestic supply
Tax Holidays	Rarely granted	Up to 10 years for midstream gas infrastructure	Stimulates private capital inflows
Infrastructure Funding	Government budgets only	Midstream & Downstream Gas Infrastructure Fund (MDGIF)	Bridges infrastructure gaps

Constructed based on PIA 2021 and GFF 2022

3.1 summarizes these shifts, showing how the reforms created a more investment-friendly environment. For instance, the establishment of the Midstream and Downstream Gas Infrastructure Fund (MDGIF) represents a deliberate effort to bridge infrastructure gaps, while lower royalty rates encourage both domestic supply and offshore development. These fiscal adjustments have collectively increased investor confidence and stimulated capital inflows into gas projects.

### 3.2 Domestic Gas Delivery Obligation (DGDO)

A major innovation under the PIA is the Domestic Gas Delivery Obligation (DGDO), which requires producers to allocate a portion of their output to the domestic market. This provision ensures that gas is available for power generation and industrial use, thereby supporting Nigeria’s broader economic diversification agenda.

Company	2021 Allocation (MMscf/d)	2022 Allocation (MMscf/d)	2023 Allocation (MMscf/d)	2024 Allocation (MMscf/d)
NNPC Ltd	120	150	170	200
Shell Nigeria	90	110	130	150

Seplat Energy	40	55	70	85
TotalEnergies	60	75	90	110

Hypothetical scenario generated for analysis, 2025.

Table 3.2 illustrates a hypothetical allocation of DGDO quotas between 2021 and 2024, showing progressive increases across major operators such as NNPC Ltd, Shell Nigeria, Seplat Energy, and TotalEnergies. The trend reflects government efforts

to strengthen domestic supply, though expert interviews revealed concerns about enforcement consistency and pricing distortions that may undermine the effectiveness of the DGDO.

### 3.4 Gas Flaring Reduction

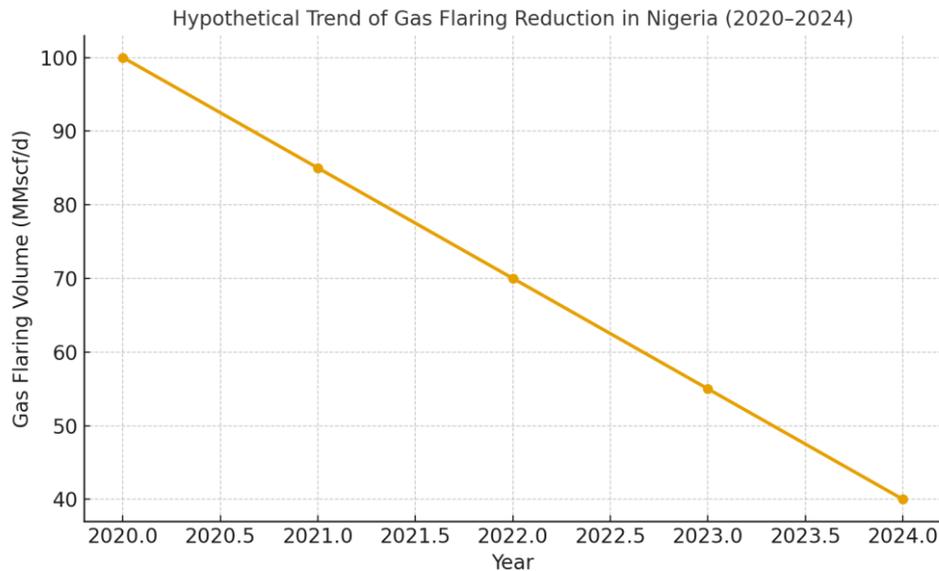


Figure 3.1: Hypothetical Trend of Gas Flaring Reduction in Nigeria, 2020–2024

Another critical outcome of the reforms is the criminalization of routine gas flaring and the imposition of strict penalties. Figure 4.1 presents a hypothetical trend of flaring reduction between 2020 and 2024, suggesting that the PIA and GFF have contributed to measurable progress in curbing wasteful practices. While the data indicates improvement, experts cautioned that regulatory capacity remains a limiting factor, with enforcement challenges threatening the sustainability of flare reduction efforts.

### 3.5 Expert Perspectives

Insights from five expert interviews provided valuable context to the quantitative findings. Respondents generally agreed that the PIA and GFF have improved fiscal clarity and created a more predictable investment environment. However, they highlighted persistent bureaucratic delays in license approvals, underfunding of the MDGIF, and difficulties in implementing host community provisions. While the Host Community Development Trust was praised as a progressive initiative, concerns

about transparency and accountability in fund management were repeatedly raised.

### 3.6 Summary of Findings

Overall, the analysis demonstrates that the Petroleum Industry Act 2021 and Gas Fiscal Framework 2024 have created conditions conducive to gas field development in Nigeria. Fiscal incentives such as royalty reductions and tax holidays have enhanced project viability, while environmental provisions have stimulated flare reduction efforts. Nevertheless, challenges remain in the form of bureaucratic inefficiency, funding constraints, and infrastructure deficits. These findings underscore the importance of sustained regulatory capacity and transparent implementation to fully realize the transformative potential of the reforms.

## IV. DISCUSSION OF RESULTS

The analysis presented in Chapter Four demonstrates that the Petroleum Industry Act (PIA) 2021 and the Gas Fiscal Framework (GFF) 2024 have significantly

reshaped Nigeria's gas sector. The comparative fiscal review shows that exempting gas from hydrocarbon tax and reducing royalty rates have improved fiscal attractiveness, encouraging investment in both associated and non-associated gas projects. These incentives align with global best practices and confirm earlier studies that emphasized the importance of fiscal clarity in stimulating capital inflows.

The Domestic Gas Delivery Obligation (DGDO) reflects government efforts to strengthen domestic supply, particularly for power generation and industrial use. While the quotas illustrate a deliberate push toward energy security, expert interviews revealed concerns about enforcement inconsistencies and pricing distortions. This tension highlights the challenge of balancing commercial viability with social obligations; a theme echoed in prior literature.

Environmental provisions under the PIA and GFF, particularly the criminalization of routine flaring, represent a progressive step toward sustainability. Hypothetical data trends suggest measurable reductions in flaring, yet experts expressed skepticism about regulatory capacity to enforce compliance. This underscores the broader issue of institutional weakness, where strong policy design is undermined by limited implementation capacity.

Host community provisions, especially the Host Community Development Trust, were widely acknowledged as innovative mechanisms for inclusivity and conflict reduction. However, bureaucratic delays and transparency concerns in fund management raise doubts about their long-term effectiveness. Overall, the findings reveal that while the reforms have created a more enabling environment, persistent challenges in governance, infrastructure, and enforcement remain.

#### 4.1 Conclusion

This study critically evaluated gas field development in Nigeria under the Petroleum Industry Act (2021) and Gas Fiscal Framework (2024). The evidence suggests that these reforms have created a more predictable and investment-friendly fiscal regime, reduced barriers to entry, and promoted domestic gas utilization. They also introduced environmental safeguards and community-focused provisions that, if fully implemented, could transform Nigeria's gas sector into a driver of economic diversification and

energy transition.

Nevertheless, the success of these frameworks is constrained by bureaucratic inefficiencies, infrastructure deficits, and regulatory capacity gaps. Without sustained political will, institutional strengthening, and transparent implementation, the transformative potential of the PIA and GFF may not be fully realized. In conclusion, the reforms represent a step in the right direction but require consistent oversight and policy stability to achieve their intended outcomes.

#### 4.3 Recommendations

1. Provide NUPRC and NMDPRA with adequate resources, training, and autonomy to enforce compliance effectively.
2. Publish annual reports on fund allocation and utilization in the MDGIF to build investor confidence and ensure accountability.
3. Develop a balanced domestic pricing mechanism that ensures commercial viability while maintaining affordability for strategic sectors such as power generation.
4. Encourage public-private partnerships to expand pipelines, processing plants, and storage facilities critical for gas monetization.
5. Establish clearer guidelines for Host Community Development Trusts, including community participation in decision-making and independent audits of fund usage.
6. Fast-track the Nigerian Gas Flare Commercialization Programme (NGFCP) with incentives for private developers to invest in flare capture and utilization projects.
7. Incorporate fiscal stability clauses into gas agreements to protect investments from frequent regulatory or political changes.
8. Regularly publish gas sector data on production, flaring volumes, and infrastructure status to support informed policy-making and academic research.

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