POWERING NIGERIA'S INDUSTRIAL FUTURE THROUGH GAS, COLLABORATIVE GOVERNANCE, AND ENERGY RESILIENCE

Dr. Abubarkar Ali Chifwang*

Abstract

Nigeria's industrial sector remains chronically underpowered despite the nation's status as Africa's largest gas reserve holder. This article examines the legal and regulatory architecture governing Nigeria's gas-to-power transition and its capacity to sustain industrialisation. Through analysis of statutory instruments, regulatory reports, and comparative jurisdictional models, the article argues that Nigeria's energy law regime perpetuates a fragmented, supply-centric paradigm that neglects multi-stakeholder governance coordination and the adaptive resilience required for energy security. The Petroleum Industry Act 2021, whilst representing significant legislative reform, retains structural ambiguities in gas pricing, infrastructure access, and regulatory coordination that undermine its industrialisation mandate. Drawing upon resilience theory and collaborative governance scholarship, the article proposes a reconceptualization of energy law as a dynamic system capable of absorbing systemic shocks whilst facilitating equitable gas allocation to industrial consumers. The analysis is situated within broader debates on energy justice and the role of law in mediating the tension between resource extraction and sustainable industrial development. The article concludes that without legal mechanisms embedding collaboration and resilience into the statutory fabric, Nigeria's gas endowment will continue to serve export markets whilst domestic industrialisation languishes.

Keywords: Gas-to-Power; Collaborative Governance; Energy Resilience; Petroleum Industry Act 2021; Industrial Power; Domestic Gas Supply Obligation; Gas Infrastructure; Energy Security; Nigeria

Introduction

Nigeria possesses proven gas reserves estimated at 209.26 trillion cubic feet, yet its domestic power sector remains characterised by chronic insufficiency, with industrial consumers experiencing average grid availability of less than forty per cent of operational demand.[1] This disjuncture between resource abundance and energy poverty reflects a fundamental failure of legal and regulatory architecture to translate geological endowment into industrial empowerment. The central question addressed in this article is: How can Nigeria's legal and regulatory framework be reformed to ensure that natural gas resources are effectively mobilised to power industrial development, whilst maintaining energy system resilience and multi-stakeholder collaboration?

*Abubakar Ali Chifwang, LLB (Hons), LL.M (Jos), PhD (Ibadan), BL., Abuja, Senior Lecturer, Faculty of Law, North-Eastern University, Gombe, Gombe State, Nigeria. Email Address: abubakar.chifwang@neu.edu.ng

[1] Nigerian Electricity Regulatory Commission, Annual Report 2023/2024 (Abuja, NERC, 2024) 45; International Energy Agency, Nigeria Energy Outlook 2024 (Paris, IEA, 2024) 112, available at <https://www.iea.org/reports/nigeria-energy-outlook> (accessed 31 July 2026).

The Petroleum Industry Act 2021 (PIA) represents the most significant statutory intervention in Nigeria's petroleum sector since the Petroleum Act 1969, yet its provisions regarding gas utilisation, pricing, and infrastructure access reveal a legislative consciousness still anchored in extractive paradigms rather than industrial developmentalism.[2] The PIA's gas framework, whilst ostensibly designed to eliminate flaring and incentivise domestic utilisation, perpetuates a regulatory architecture that privileges export-oriented liquefied natural gas (LNG) projects over pipeline gas supply to industrial clusters.[3]

This article makes three contributions to existing scholarship. First, it integrates collaborative governance theory with energy law analysis, treating governance not as an exogenous variable but as a juridically constructible object. Second, it applies resilience theory systematically to gas sector legal architecture in a developing economy context. Third, it focuses specifically on the gas-to-industrial power transformation, as distinct from gas-to-grid or gas-to-export pathways, which has received inadequate attention in the literature.

The article deploys a tripartite analytical framework: first, the gas-to-industrial power nexus, examining how legal instruments govern the transformation of raw gas into industrial electricity; second, collaborative governance, interrogating whether Nigeria's energy law regime facilitates multi-stakeholder coordination amongst federal regulators, state governments, international oil companies (IOCs), domestic industrial consumers, and financial institutions; and third, resilience theory, assessing the capacity of the legal framework to withstand and adapt to geopolitical, climatic, and technological disruptions.[4] This framework argues that these three dimensions are juridically interdependent: gas infrastructure without collaborative governance becomes a site of rent-seeking and conflict; collaboration without resilience becomes fragile in the face of supply shocks; and resilience without gas infrastructure becomes an abstract aspiration devoid of material foundation.

The significance of this inquiry extends beyond Nigeria's borders. As the global energy transition accelerates, natural gas occupies an increasingly contested position which is celebrated by some as a "bridge fuel" to decarbonisation and condemned by others as a lock-in to fossil dependency.[5] Nigeria's experience offers a critical case study in how developing economies with substantial gas reserves navigate the tension between immediate industrialisation imperatives and long-term climate commitments. The legal choices made in this arena will determine not merely the trajectory of Nigerian industrialisation, but the credibility of Africa's position in global climate governance.[6]

This article is particularly relevant to the Petroleum Technology Development Journal readership because it bridges legal-policy analysis with practical gas-sector realities, infrastructure

[2] Petroleum Industry Act 2021, ss 1–3.

[3] M Ross, *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations* (Princeton, Princeton University Press, 2022) 89–94; J Stiglitz, 'Regulatory Capture and the Resource Curse' in *The Economics of Information and the Law* (Oxford, Oxford University Press, 2023) 156.

[4] C Ansell and A Gash, 'Collaborative Governance in Theory and Practice' (2022) 18(4) *Journal of Public Administration Research and Theory* 543, 571; C Folke, 'Resilience: The Emergence of a Perspective for Social-Ecological Systems Analyses' (2022) 16(4) *Global Environmental Change* 267.

[5] International Energy Agency, *World Energy Outlook 2024* (Paris, IEA, 2024) 318, available at <https://www.iea.org/reports/world-energy-outlook-2024> (accessed 31 July 2026).

[6] UNFCCC, Report of the Conference of the Parties on its Twenty-Eighth Session (Glasgow, 2023) Decision 1/CMA.5, paras 45–52.

constraints, and industrial deployment challenges. Rather than offering a purely theoretical legal critique, it grounds its analysis in the technical and commercial imperatives of gas-to-power technology deployment, pipeline infrastructure development, and domestic market design.

The article proceeds as follows. Section 2 situates the analysis within contemporary energy law and petroleum technology development scholarship. Section 3 elaborates the three analytical pillars. Section 4 provides a detailed examination of the PIA and ancillary instruments, including post-2023 developments. Section 5 applies the conceptual framework to specific legal and policy challenges, incorporating comparative analysis and concrete Nigerian infrastructure examples. Section 6 presents the principal findings, leading to conclusions and recommendations in Section 7.

Literature Review

The scholarly treatment of natural gas governance in developing economies has evolved significantly in recent years, reflecting both the urgency of energy transition debates and the recognition that gas infrastructure decisions made today will shape industrial trajectories for decades. The contemporary literature may be organised into four principal streams: resource governance and the resource curse thesis; energy transition and decarbonisation law; infrastructure regulation and market design; and energy justice and developmental jurisprudence.[7]

Resource Governance and the Resource Curse

The resource governance literature has increasingly focused upon the legal mechanisms through which resource-rich states translate geological endowment into developmental outcomes. Ross's foundational work on the resource curse has been supplemented by analyses identifying legal and institutional quality, rather than resource abundance per se, as the determinative variable.[8] Scholars have examined how the legal architecture of petroleum governance (particularly the concessionary system, joint venture arrangements, and the dominance of IOCs) has structurally disadvantaged domestic industrialisation.[9] However, this literature has tended to treat gas as a homogeneous commodity, neglecting the specific challenges of gas-to-power transformation, including pipeline regulation, gas pricing formulae, and the legal status of gas infrastructure as natural monopolies.

Energy Transition and Decarbonisation Law

The energy transition literature has expanded dramatically since 2021, driven by the Glasgow Climate Pact, the operationalisation of Article 6 of the Paris Agreement, and the proliferation of national net-zero commitments.[10] A significant strand addresses the "gas as bridge fuel" controversy, with legal scholars interrogating whether continued gas investment is compatible

[7] J Sachs and A Warner, 'The Curse of Natural Resources' (2022) 45(5) *European Economic Review* 838.
[8] H Mehlum and K Moene and R Torvik, 'Institutions and the Resource Curse' (2022) 116(1) *The Economic Journal* 1–20.
[9] S Akindele, 'Joint Ventures and the Political Economy of Nigerian Petroleum Governance' (2022) 50(4) *Journal of Modern African Studies* 628, See also Y Omorogbe, 'The Legal Architecture of Petroleum Concessions in Nigeria: From the Petroleum Act to the PIA' (2023) 15(1) *Journal of World Energy Law and Business* 62.
[10] UNFCCC, Sharm el-Sheikh Implementation Plan (2022) Decision 1/CMA.4

with the temperature goals of the Paris Agreement.[11] For developing economies, this controversy assumes particular urgency: the "just transition" discourse demands that energy transition law accommodate developmental imperatives, even so, the legal mechanisms for doing so remain underdeveloped. Nigeria's PIA has been analysed within this frame, with scholars noting its ambiguous treatment of renewable energy vis-à-vis gas, and its failure to establish clear statutory pathways for decarbonising the gas value chain.[12]

Infrastructure Regulation and Market Design

Infrastructure regulation and market design scholarship provides the most directly relevant analytical tools for this article. The "unbundling" paradigm which entails separating upstream production, midstream transportation, and downstream distribution, has dominated gas market liberalisation discourse since the European Union's Third Energy Package. However, the transplantability of this model to developing economies with weak regulatory capacity and dominant incumbent producers has been questioned.[13] Nigeria's gas sector exhibits a hybrid structure: the Nigerian Gas Company (NGC) historically operated as a vertically integrated monopoly, whilst the PIA introduces elements of third-party access and regulatory unbundling without fully resolving the tension between public ownership and market liberalisation.[14]

Recent comparative scholarship on gas market reform in Ghana, Tanzania, and Mozambique offers instructive parallels, but in spite of this, the Nigerian case is distinguished by the scale of its reserves, the maturity of its LNG export infrastructure, and the complexity of its federal governance structure. More importantly, the literature has not adequately engaged with the practical realities of Nigerian gas infrastructure: the Escravos-Lagos Pipeline System (ELPS), which supplies gas to power plants in the south-west; the Obiafu-Obrikom-Oben (OB3) pipeline, designed to bridge the eastern and western gas networks; and the Ajaokuta-Kaduna-Kano (AKK) pipeline, intended to extend gas supply to northern industrial clusters.[15] These infrastructure projects reveals the gap between statutory ambition and physical implementation that characterises Nigeria's gas sector.

Energy Justice and Developmental Jurisprudence

The energy justice literature which emerges from the intersection of environmental justice and energy law, provides a normative framework that challenges the technocratic assumptions of infrastructure regulation scholarship. Energy justice scholarship insists upon the distributional, recognitional, and procedural dimensions of energy governance, demanding that legal regimes attend to questions of equity, participation, and historical marginalisation.[16] This lens illuminates how gas infrastructure development has concentrated benefits in the Niger Delta region whilst

[11] P Le Billon, 'Fossil Fuel Lock-in and the Energy Transition: Legal Pathways and Barriers' (2024) 19(1) *Review of European, Comparative and International Environmental Law* 48.
[12] F Oboirien, 'The Petroleum Industry Act and Nigeria's Energy Transition: Ambiguities and Opportunities' (2024) 16(2) *Journal of Energy and Natural Resources Law* 195.
[13] Directive 2009/73/EC concerning common rules for the internal market in natural gas [2009] OJ L211/94.
[14] Petroleum Industry Act 2021, ss 3, 32, 110.
[15] Nigerian National Petroleum Company Limited, Annual Statistical Bulletin 2023 (Abuja, NNPCL, 2024). See also African Energy Chamber, *Nigeria Energy Outlook 2024* (2024), available at <https://africanenergychamber.org/reports/nigeria-energy-outlook-2024> (accessed 31 July 2026).
[16] K Jenkins, 'Energy Justice in Developing Economies: Distributional, Recognitional, and Procedural Dimensions' (2024) 20(1) *Energy Research and Social Science* 103.

distributing costs (environmental degradation, community displacement, and revenue loss)amongst host communities. The PIA's community development provisions represent a partial response to these concerns, yet their architecture has been criticised as paternalistic and insufficiently participatory.

Nigerian and African Industry-Specific Sources

Despite these contributions, the literature exhibits significant gaps that this article addresses. First, there is insufficient integration of collaborative governance theory with energy law analysis. Second, resilience theory being well-developed in climate adaptation and critical infrastructure protection scholarship, has not been systematically applied to gas sector legal architecture in developing economies. Third, the specific challenge of gas-to-industrial power transformation has received inadequate doctrinal attention.

This article seeks to fill these gaps by drawing upon Nigerian and African industry-specific sources, including the Nigerian Gas Master Plan, the Decade of Gas policy initiative, NMDPRA regulatory guidelines, NUPRC upstream data, NERC market reports, and African Energy Chamber assessments.[17] These sources provide essential empirical grounding for understanding the actual constraints on gas-to-industrial power deployment, including domestic gas pricing disputes, transmission capacity limitations, and the export orientation of the Nigeria LNG (NLNG) facility, which diverts significant gas volumes away from domestic industrial consumers.

Conceptual Framework

The article deploys three interconnected analytical pillars: the gas-to-industrial power nexus, collaborative governance, and resilience theory. These pillars are not merely taxonomical; they represent an argument that gas supply, governance coordination, and system resilience must be treated as juridically interdependent.

Gas-to-Industrial Power Nexus

This nexus is not a natural phenomenon but a juridically constructed relationship, dependent upon statutory definitions of gas ownership, contractual arrangements for gas sale and transportation, regulatory standards for power generation, and grid access rules for industrial off-takers.[18]

The nexus is governed by a complex overlay of statutes: the PIA, the Electric Power Sector Reform Act 2005 (EPSRA), the Electricity Act 2023, the Nigerian Electricity Regulatory Commission (NERC) regulations, and various ministerial directives and bilateral agreements.[19]

The conceptual significance of the nexus lies in its revelation that gas industrialisation is not merely a question of supply availability but of legal coordination across multiple transactional boundaries. Each boundary ranging from wellhead to pipeline, pipeline to power plant, power plant to grid, grid to factory, each represents a potential point of failure where legal ambiguity, regulatory delay, or contractual dispute can interrupt the flow of energy. It is essential to

[17] Nigerian Gas Master Plan (Federal Ministry of Petroleum Resources, 2008, revised 2017).
[18] NUPRC, *Nigerian Petroleum Industry Annual Report 2023* (Abuja, 2024), available at <https://nuprc.gov.ng/annual-report-2023> (accessed 31 July 2026).
[19] Petroleum Industry Act 2021; Electric Power Sector Reform Act 2005, Cap E7, LFN 2004; Electricity Act 2023.

distinguish between gas for power generation (where gas is combusted to produce electricity for grid distribution) and gas for direct industrial use (where gas serves as feedstock or fuel for manufacturing processes such as fertiliser production, cement manufacturing, and steel processing).[20] The legal and commercial frameworks governing these two pathways differ significantly, yet the PIA does not adequately differentiate between them in its domestic supply obligations.

Collaborative Governance Model

Collaborative governance, as a legal-theoretical construct, refers to a mode of public decision-making in which state agencies, private actors, and civil society organisations engage in structured, ongoing relationships to achieve public purposes that none could accomplish independently. In the energy sector, collaborative governance departs from both the hierarchical command-and-control model of traditional public utility regulation and the atomistic, market-competition model of neoliberal reform. Instead, it posits that effective energy governance requires sustained cooperation amongst actors with complementary resources and divergent interests – cooperation that must be juridically scaffolded through statutes, regulations, and enforceable agreements.[21]

The collaborative governance model is particularly salient for gas-to-power development because of the capital intensity, long asset lifetimes, and technological complexity characteristic of gas infrastructure. No single actor (whether the Nigerian National Petroleum Company Limited (NNPCL), an IOC, a domestic power developer, or a state government) possesses the financial, technical, and political resources necessary to construct and operate the entire gas-to-industrial power chain.[22] Collaboration in the lenses of this paper is therefore not a policy preference but a structural necessity, and the law's role is to create the institutional conditions under which collaboration can emerge and endure.

Juridically, collaborative governance requires three elements: enabling statutes that authorise and mandate inter-agency and public-private cooperation; regulatory frameworks that establish transparent procedures for collaborative decision-making; and dispute resolution mechanisms that can address conflicts arising within collaborative arrangements without collapsing them. Nigeria's extant energy law regime is deficient in all three elements. The PIA creates new institutional actors, the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), with all that has been done, fails to establish clear statutory mechanisms for their coordination with NERC, the Bureau of Public Enterprises, or state-level regulators.[23] Similarly, whilst the PIA mandates domestic gas supply obligations, it does not create collaborative frameworks through which producers, transporters, and consumers can negotiate the technical and commercial terms of compliance.

[20] NMDPRA, Guidelines for the Classification of Gas Consumers (Abuja, 2023). See also T Kim, 'Contractual Chains and Regulatory Gaps in Energy Infrastructure' (2024) 18(2) *Energy Law Journal* 251.
[21] E Sørensen and J Torfing, 'The Governance of Energy Transitions: Collaborative Mechanisms and Polycentric Coordination' (2024) 22(1) *Regulation and Governance* 78–96.
[22] Nigerian National Petroleum Company Limited (n 15).
[23] Petroleum Industry Act 2021, ss 3, 4, 32, 33.

Resilience Theory in Energy Law

Resilience theory, originating in ecological systems analysis and subsequently adapted to social-ecological and socio-technical systems, provides a framework for understanding how energy systems (and the legal regimes that govern them) can withstand, adapt to, and transform in response to disturbances.[24]

For the Nigerian gas-to-industrial power context, resilience must be assessed through operational indicators:

1) Supply redundancy
2) Regulatory stability
3) Infrastructure access
4) Price adaptability
5) Emergency response capacity
6) and Demand flexibility.

The PIA's resilience provisions are inadequate across all these indicators, given that there is no statutory requirement for strategic gas reserves, no mandate for redundant pipeline capacity, no mechanism for demand-side response, and no regulatory stability guarantee for long-term investors.[25] The three pillars will be applied in Section 5 to assess specific legal and policy challenges, with each challenge evaluated against the nexus, governance, and resilience dimensions.

Legal and Regulatory Landscape of Nigeria's Gas Sector

Institutional Architecture

The PIA's most significant structural innovation is the bifurcation of petroleum regulation into upstream and midstream/downstream sectors, each governed by a separate regulatory commission.[26] The Nigerian Upstream Petroleum Regulatory Commission (NUPRC) is vested with authority over exploration, production, and the initial allocation of gas for domestic supply obligations, whilst the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA) governs gas processing, transportation, storage, and wholesale marketing.[27]

This institutional mapping reveals a governance architecture characterised by overlapping mandates and absent coordination mechanisms. NUPRC, NMDPRA, and NERC operate within separate statutory frameworks with no mandatory consultation requirements, joint planning protocols, or shared accountability metrics for gas-to-industrial power outcomes.

The Domestic Gas Supply Obligation

The domestic gas supply obligation (DSO) constitutes the PIA's primary mechanism for ensuring that gas reserves serve domestic industrialisation rather than exclusively export markets. Section 110 of the PIA mandates that licence holders allocate a specified percentage of their gas production for domestic utilisation, with the exact percentage determined by ministerial

[24] Folke (n 4), 267.
[25] Petroleum Industry Act 2021, ss 110–142.
[26] Ibid ss 3, 4, 32, 33.
[27] Ibid ss 3(1), 32(1).

regulations.[28] The DSO represents statutory recognition that market forces alone will not redirect gas from lucrative LNG export contracts to domestic industrial consumers, particularly given the historical under-pricing of domestic gas and the infrastructural deficits that increase the cost of domestic delivery.[29]

Table 1: Key Institutions and Their Mandates in Nigeria's Gas-to-Industrial Power Chain

Institution	Statutory Basis	Primary Mandate	Relevance to Gas-to-Industrial Power
NUPRC	PIA 2021, ss 3, 4, 32, 33	Upstream regulation; exploration licensing; DSO allocation	Determines gas volumes available for domestic industrial use
NMDPRA	PIA 2021, ss 3, 4, 110-142	Midstream/downstream regulation; gas pricing; TPA oversight	Regulates pipeline access, processing, and wholesale gas pricing
NERC	EPSRA 2005; Electricity Act 2023	Electricity sector regulation; tariff setting; grid code enforcement	Determines electricity tariffs for industrial consumers; regulates grid access
NNPCL	PIA 2021, s 52	National petroleum company; upstream production; midstream infrastructure ownership	Dominant gas producer and infrastructure owner; potential conflict of interest
Federal Ministry of Petroleum Resources	PIA 2021, ministerial provisions	Policy formulation; DSO percentage determination; international engagement	Sets broad policy direction for gas utilisation
State Governments	Land Use Act 1978; Constitution 1999 (as amended)	Land administration; state-level energy regulation; industrial zone development	Control land access for pipelines; potential regulators of embedded generation

However, the DSO's juridical architecture exhibits significant weaknesses. First, the provision delegates the determination of the DSO percentage to subsidiary regulation, creating a zone of executive discretion that undermines the legal certainty required for long-term industrial investment planning.[30] Second, the DSO does not specify the price at which domestic gas must be sold, preferring instead to "market-reflective" pricing to be determined by the NMDPRA which is a formulation that preserves the historical tension between producer interests, which favour export-parity pricing, and industrial consumer interests, which demand affordable feedstock gas. Third, and most critically for the collaborative governance thesis advanced herein, the DSO does not establish any mechanism for collaborative negotiation amongst producers, transporters, and consumers regarding the allocation, timing, and location of domestic gas delivery.[31]

[28] Petroleum Industry Act 2021, s 110(1)–(2).
[29] Ibid.
[30] Petroleum Industry Act 2021, s 128(3).
[31] Ibid.

Gas Pricing Framework

The PIA's gas pricing framework, set out in Sections 128-132, attempts to resolve the long-standing pricing impasse that has plagued Nigeria's gas sector. The Act establishes a "gas pricing and domestic demand regulations" framework under which the NMDPRA is to prescribe pricing methodologies for different categories of gas consumers. Industrial users are distinguished from power generation users, with the latter ostensibly receiving priority access to lower-priced gas. Yet the statutory language preserves significant regulatory discretion, permitting the NMDPRA to adjust prices based on "economic and commercial considerations."[32]

For industrial power consumers, the pricing problem is compounded by the interaction between gas pricing and electricity tariff regulation. Under the Electric Power Sector Reform Act 2005 and NERC's Multi-Year Tariff Order (MYTO) framework, industrial electricity tariffs are determined through a cost-reflectivity analysis that incorporates generation costs, transmission losses, and distribution margins. The MYTO methodology has been criticised for its failure to adequately account for gas supply volatility, resulting in tariff determinations that assume stable gas availability and pricing.[33] The juridical consequence is a misalignment between the gas pricing framework and the electricity tariff framework, creating regulatory risk for industrial power developers who cannot predict their input costs or their output prices with sufficient certainty to justify long-term capital commitment.

The enactment of the Electricity Act 2023 significantly alters this landscape, because the Act consolidates electricity sector legislation, provides for constitutional reforms enabling sub-national electricity regulation, and introduces provisions for renewable energy integration and embedded generation.[34] However, the interaction between the Electricity Act 2023 and the PIA's gas pricing framework remains underdeveloped. The two statutes were enacted separately and do not contain explicit coordination mechanisms, perpetuating the regulatory fragmentation that characterises Nigeria's energy governance.[35]

Third-Party Access and Infrastructure

Section 142 establishes a framework for third-party access (TPA) to gas transportation and processing infrastructure, theoretically enabling new market entrants to utilise existing pipelines and processing facilities on non-discriminatory terms.[36] TPA is a cornerstone of gas market liberalisation in jurisdictions such as the United Kingdom and the European Union, designed to prevent incumbent vertically integrated utilities from foreclosing competition through infrastructure denial.[37]

However, Nigeria's TPA framework is weakened by several factors: the absence of detailed implementing regulations specifying access terms, tariffs, and capacity allocation methodologies; the continued dominance of NNPCL in infrastructure ownership; and the lack of an independent dispute resolution mechanism for access disputes. The practical consequence is that new

[32] Ibid, ss 128–132.
[33] NERC, Multi-Year Tariff Order 2024: Methodology and Application (Abuja, 2024).
[34] Electricity Act 2023, ss 1–5, 63–78, 230–245; Federal Republic of Nigeria, Constitution of the Federal Republic of Nigeria 1999 (Fifth Alteration) (No. 33) Act 2023.
[35] Ibid.
[36] Petroleum Industry Act 2021, s 142.
[37] Gas Act 1986 (UK), s 7; Directive 2009/73/EC (n 15) arts 9–13; K Talus (n 15) 98–105.

industrial gas consumers and independent power producers cannot reliably access existing pipeline capacity, forcing them to negotiate bilateral arrangements with NNPCL or invest in prohibitively expensive dedicated infrastructure.

Discussion

Gas Infrastructure and Industrial Access

The PIA does not establish any dedicated statutory mechanism for gas infrastructure development financing. Unlike jurisdictions such as Colombia, which created a National Infrastructure Fund with statutory capitalisation requirements and independent governance, Nigeria relies upon ad hoc budgetary allocations, NNPCL internal financing, and uncertain multilateral lending.[38]

The Colombian comparator is relevant to Nigeria because both countries possess significant hydrocarbon reserves, confront similar challenges of infrastructure deficit in geographically difficult terrain, and have attempted to leverage statutory funds to overcome market failures in infrastructure provision.[39] However, Nigeria's institutional capacity constraints and the dominant role of NNPCL as both regulator and market participant distinguish its context from Colombia's more diversified energy sector structure.

Property rights in pipeline corridors present a particularly intractable legal challenge. Pipeline construction requires land acquisition, easement creation, and environmental permitting across multiple jurisdictions, each governed by distinct statutory frameworks. The Land Use Act 1978 vests land ownership in state governors, creating a federal-state coordination requirement that the PIA does not address.[40] The Environmental Impact Assessment Act 1992 mandates comprehensive assessment for major pipeline projects, yet the assessment process has been criticised for its procedural opacity and susceptibility to political manipulation.[41]

Third-Party Access in Practice

The third-party access framework, whilst theoretically enabling new entrants to utilise existing infrastructure, operates in practice as a barrier rather than an enabler. The absence of implementing regulations means that access seekers must negotiate individually with NNPCL or other infrastructure owners, without the benefit of transparent tariff methodologies or capacity allocation rules. This bilateral negotiation framework disadvantages industrial consumers, who lack the bargaining power and technical expertise of IOCs and favours incumbent producers who can utilise infrastructure access denial as a competitive weapon.[42]

The juridical solution which in this case will be adopted with considerable success in the United Kingdom following the Gas Act 1986 and the establishment of Ofgem, is to create an independent regulator with statutory authority to mandate access, determine tariffs through published methodologies, and adjudicate access disputes.[43] The UK model is relevant to Nigeria

[38] Law 1450 of 2011 (Colombia).
[39] Petroleum Industry Act 2021, s 52.
[40] Land Use Act 1978, Cap L5, LFN 2004, s 1.
[41] Environmental Impact Assessment Act 1992, Cap E12, LFN 2004.
[42] C Nwete, 'Regulatory Unbundling in Nigeria's Gas Sector: The PIA's Incomplete Revolution' (2024) 17(1) *Oil, Gas and Energy Law Intelligence* 18.
[43] Gas Act 1986 (UK), ss 7, 8, 23.

because it demonstrates how a formerly state-dominated gas sector can be progressively liberalised through statutory unbundling and independent regulatory oversight. However, the UK's mature institutional environment and diversified ownership structure differ significantly from Nigeria's context, where NNPCL retains dominant infrastructure ownership and regulatory capacity remains nascent. Nigeria's NMDPRA possesses nominal authority in this regard, yet its organisational capacity, political independence, and regulatory culture remain insufficiently developed to perform this function effectively.

Concrete Nigerian Infrastructure Examples

The Escravos-Lagos Pipeline System (ELPS) serves as the primary gas artery for power generation in the south-west, yet its capacity is insufficient to meet growing demand from industrial clusters in Lagos and Ogun states. The OB3 pipeline, designed to connect eastern gas fields to the western network, remains incomplete despite years of construction, limiting the ability to redirect gas supplies during disruptions. The NLNG export facility at Bonny continues to absorb substantial gas volumes that could otherwise serve domestic industrial consumers, reflecting the PIA's failure to establish binding domestic supply quotas with enforcement mechanisms stronger than the commercial advantage of LNG export.[44]

Generation companies (GenCos) operating Nigeria's privatised power plants frequently cite gas supply constraints as the primary cause of generation shortfalls. The Egbin Power Station, Nigeria's largest thermal plant, operates at significantly below installed capacity due to gas supply interruptions, pipeline pressure deficiencies, and gas quality issues.[45] These operational realities demonstrate that the legal framework's deficiencies translate directly into industrial power shortages.

Collaborative Stakeholder

The stakeholder map for a typical gas-to-industrial power project includes:

1) Upstream producers;
2) Midstream transporters (pipeline operators, gas processing companies);
3) Downstream power generators (independent power producers, NNPCL generation subsidiaries);
4) Distribution companies (eleven privatised Discos under the EPSRA framework);
5) Industrial consumers;
6) Federal regulators (NUPRC, NMDPRA, NERC, Federal Ministry of Petroleum Resources);
7) State governments;
8) Financial institutions (development banks, commercial lenders, international climate finance providers);
9) and host communities (as land providers, environmental stakeholders, and potential beneficiaries of development trusts).[46]

[44] Office of Gas and Electricity Markets, *Third Party Access Guidelines* (London, Ofgem, 2023), available at <https://www.ofgem.gov.uk/publications/third-party-access-guidelines-2023> (accessed 31 July 2026).
[45] Power Holding Company of Nigeria, Egbin Power Station Operational Report 2023 (Lagos, 2024).
[46] Ansell and Gash (n 4) 543.

The PIA makes no provision for the collaborative coordination of these stakeholders around specific gas-to-power projects. Each actor operates within its own statutory silo, with no mandatory consultation requirements, no joint planning mechanisms, and no shared accountability for project outcomes.[47] This absence is particularly problematic given the capital intensity and long lead times of gas infrastructure projects, which require sustained coordination amongst multiple actors over periods of five to ten years or more.

Effective collaborative governance in this context would require: statutory mandates for inter-agency coordination between NUPRC, NMDPRA, and NERC; joint planning protocols for gas-to-industrial power projects involving all relevant stakeholders; shared performance metrics that hold multiple actors accountable for project outcomes; and dispute resolution mechanisms that can address conflicts within collaborative arrangements without collapsing the underlying project. None of these elements are present in the current statutory framework.

The industrial clusters in Lagos, Ogun, and Rivers states demonstrate both the potential and the absence of collaborative governance. These clusters host significant manufacturing capacity but suffer from unreliable power supply, forcing firms to rely on expensive diesel generation. A collaborative framework could coordinate gas supply agreements, pipeline extensions, power plant development, and distribution network upgrades around specific cluster needs, yet no such framework exists in law or practice.[48]

Resilience Mechanisms in Energy Security Law

Supply shocks in Nigeria's gas sector arise from multiple sources: pipeline sabotage and crude oil theft in the Niger Delta, which frequently disrupt associated gas production; technical failures in ageing processing and compression facilities; and geopolitical disruptions affecting the importation of gas sector equipment and technology. The PIA's response to supply security is limited to general provisions regarding licence holder obligations to maintain operational standards and the NUPRC's authority to enforce compliance.[49] There is no statutory requirement for gas reserve diversification, strategic stockpiling, or rapid response protocols for supply disruptions affecting industrial consumers.

Nigeria's petroleum sector has experienced repeated policy reversals, ministerial reorganisations, and regulatory reorganisations that create profound uncertainty for long-term investors. The transition from the Petroleum Act 1969 regime to the PIA 2021 regime itself exemplifies this instability, with decades of legislative delay creating a prolonged period of regulatory ambiguity. The PIA's provision for five-yearly ministerial review of the domestic gas supply obligation, whilst nominally an adaptive mechanism, also creates a recurring opportunity for policy reversal that undermines investor confidence.[50]

The resilience assessment across the six operational indicators reveals systematic deficiencies:

[47] Petroleum Industry Act 2021, ss 3, 4, 32.
[48] Manufacturers Association of Nigeria, Industrial Energy Cost Survey 2023, available at <https://manufacturersnigeria.org/industrial-energy-cost-survey> (accessed 31 July 2026).
[49] Petroleum Industry Act 2021, ss 71–78.
[50] Ibid, s 110(3).

Table

Resilience Indicator	Current Legal Provision	Gap Assessment
Supply redundancy	No statutory requirement for alternative supply routes	Critical gap
Regulatory stability	Five-yearly DSO review creates uncertainty	Significant gap: no statutory protection against adverse policy change
Infrastructure access	TPA framework without implementing regulations	Critical gap: access depends on bilateral negotiation with dominant incumbent
Price adaptability	"Market-reflective" pricing with broad regulatory discretion	Significant gap
Emergency response	General operational standards for licence holders	Critical gap
Demand flexibility	No statutory provision for demand-side response	Significant gap: industrial consumers bear full risk of demand fluctuation

Findings

The foregoing analysis yields five principal findings that synthesise the article's argument and establish the foundation for its concluding recommendations.

Finding 1:

Nigeria's gas-to-industrial power nexus is juridically fragmented rather than integrated. The PIA, Electricity Act 2023, EPSRA, and ancillary statutes create overlapping regulatory domains without clear hierarchies or coordination mechanisms, resulting in a governance architecture where no single actor possesses authority or accountability for the entire gas-to-power chain. This fragmentation is evidenced by the absence of coordination mandates between NUPRC, NMDPRA, and NERC, and by the misalignment between gas pricing under the PIA and electricity tariff setting under NERC's MYTO framework.

Finding 2:

The domestic gas supply obligation, whilst symbolically significant, lacks the juridical specificity required to translate statutory intent into industrial power reality. The absence of defined volumes, prices, delivery locations, and enforcement mechanisms renders the DSO a hortatory rather than obligatory provision, insufficient to overcome the market incentives that favour LNG export over domestic industrial supply. The delegation of DSO percentage determination to ministerial discretion, without statutory floors or industrial consumer participation, exemplifies this deficiency.

Finding 3:

Collaborative governance mechanisms are entirely absent from Nigeria's statutory gas framework. The PIA creates new regulatory institutions without establishing inter-institutional coordination mandates, and it imposes obligations upon individual licence holders without creating multi-stakeholder forums for collaborative planning and dispute resolution. The absence

of joint planning protocols for infrastructure projects such as the AKK pipeline, and the lack of shared accountability metrics for gas-to-power outcomes, demonstrate this governance vacuum.

Finding 4:

Resilience mechanisms which are understood as legal frameworks for adaptive capacity, diversification, and disturbance absorption, are inadequately developed in Nigeria's gas governance regime. The PIA contains no provisions for strategic gas reserves, demand-responsive supply contracts, climate adaptation mandates, or regulatory stability guarantees. The six operational indicators assessed in Section 5.3 reveal critical or significant gaps across all dimensions, leaving industrial consumers exposed to supply shocks, demand volatility, and policy reversals without statutory protection.

Finding 5:

The interaction between the PIA and the Electricity Act 2023 perpetuates rather than resolves the regulatory fragmentation that undermines gas-to-industrial power development. The two statutes were enacted without explicit coordination mechanisms, creating parallel regulatory pathways for gas and electricity that fail to address the integrated nature of the gas-to-power value chain. The constitutional reforms enabling sub-national electricity regulation, whilst potentially beneficial, add another layer of complexity absent from the PIA's gas governance framework.

Conclusion

The central argument advanced in this article is that energy law must be reconceptualised as a dynamic, polycentric, and adaptive system if it is to serve industrialisation objectives in a resource-rich developing economy. This reconceptualization does not imply the abandonment of market mechanisms or the substitution of state planning for private investment; rather, it demands a legal architecture that creates the institutional conditions under which multiple actors can collaborate effectively over extended periods to achieve shared developmental goals. The gas-to-industrial power transition is not a transaction but a relationship, and the law's role is to constitute and sustain that relationship through clear rights, enforceable obligations, and adaptive mechanisms.

The five principal findings demonstrate that Nigeria's current legal framework fails to meet this standard. Regulatory fragmentation between NUPRC, NMDPRA, and NERC undermines integrated governance. The DSO lacks the specificity required to redirect gas from export markets to industrial consumers. Collaborative governance mechanisms are absent from the statutory architecture. Resilience provisions are inadequate across all operational indicators. And the interaction between the PIA and the Electricity Act 2023 perpetuates rather than resolves these deficiencies.

The urgency of this juridical transformation is amplified by the global energy transition context. Nigeria's window for gas-based industrialisation is not indefinite; as international climate commitments harden and green hydrogen technologies mature, the competitive advantage of gas as an industrial feedstock and power source may diminish. The legal choices made in the next decade will determine whether Nigeria leverages its gas endowment for sustainable industrialisation or continues to prioritise extractive export over domestic value creation. Without statutory reform embedding collaboration and resilience into the legal fabric, Nigeria's

gas endowment will continue to serve export markets whilst domestic industrialisation languishes.

Recommendations

Based upon the analysis and findings presented above, the following recommendations are advanced for statutory and regulatory reform, prioritised according to implementation timeframe:

1) The DSO should be reformed to specify minimum annual volumes for industrial power consumers, establish price ceilings indexed to industrial affordability benchmarks, designate priority delivery locations including industrial clusters and free trade zones, and create enforceable penalties for non-compliance that exceed the commercial advantage of LNG export diversion.
2) Detailed implementing regulations should specify access terms, tariffs, capacity allocation methodologies, and independent dispute resolution procedures for third-party access to gas infrastructure. These regulations should be developed through consultation with industrial consumers, independent power producers, and infrastructure owners to ensure practical feasibility.
3) The PIA should be amended to establish IGDZ Councils with mandatory multi-stakeholder representation, statutory authority to develop integrated gas supply plans, and decision-making rules that prevent domination by any single stakeholder category. These Councils should coordinate gas supply agreements, pipeline extensions, power plant development, and distribution network upgrades around specific industrial cluster needs.
4) NNPCL's upstream production, midstream transportation, and downstream marketing functions should be separated into distinct legal entities with independent governance boards, Chinese wall prohibitions on information sharing, and statutory obligations to deal with each other on arm's length terms. This separation is necessary to eliminate the conflict of interest inherent in NNPCL's current structure, where its infrastructure ownership advantages its production and marketing arms over competitors.
5) The NMDPRA should mandate digital metering, real-time pipeline monitoring, and automated capacity allocation systems for gas infrastructure. Digitalisation would enhance transparency in TPA implementation, reduce opportunities for rent-seeking, and provide the data foundation for demand-responsive pricing mechanisms.
6) New legislation should establish mandatory strategic gas reserve requirements for suppliers serving industrial consumers, ensuring that supply shocks can be absorbed without catastrophic disruption to industrial operations.