

## **Analysis of Policy and Regulation of Indonesia's Natural Gas Market**

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### **ABSTRACT**

Natural gas has re-emerged as a strategic transition fuel, yet comparative evidence remains limited on how resource-rich developing economies use domestic gas resources to strengthen energy security and market efficiency while advancing climate goals. Indonesia presents a paradox: Despite substantial reserves and a long export history, it has faced recurring domestic supply tightness driven more by regulatory and structural constraints than by resource depletion. This study examines how institutional arrangements and market design shape the efficiency of Indonesia's natural gas market. Using qualitative thematic analysis of policy and regulatory documents, stakeholder interviews, and mass-media narratives, it analyzes the interaction between regulatory governance, market structure, and stakeholder perceptions. The findings reveal a rigid market architecture characterized by vertically integrated state-owned enterprise dominance, overlapping mandates, fragmented midstream coordination, and weak third-party access implementation. Affordability-oriented pricing policies, introduced without systematic evaluation, distort price signals and investment incentives across the value chain. Limited transparency in infrastructure capacity and allocation further increases contractual risk and reliance on discretionary intervention. The study concludes that improving market performance requires governance modernization rather than rapid liberalization, especially through clearer mandates, routine policy evaluation, non-discriminatory access, targeted affordability instruments, and greater market transparency.

**Keywords:** Natural Gas Market, Energy Market Regulation, Market Structure, Energy Security, Regulatory Governance, Indonesia

**JEL Classifications:** Q48, Q41, L51

### **NOMENCLATURE**

The nomenclature section consolidates acronyms and measurement units used in this article to increase clarity and consistency,

particularly for readers unfamiliar with Indonesia's natural gas context. It is organized into acronyms and units to distinguish institutional terminology from quantitative measures used in the analysis.

Acronyms	
AGIT	Account guarantee and internal transfer mechanism for price compensation
APEC–OECD	Asia Pacific Economic Cooperation – Organization for Economic Co-operation and Development
BBG	Natural gas fuel
BPH Migas	Downstream Oil and Gas Regulatory Agency of Indonesia
FGD	Focus Group Discussion
FSRU	Floating Storage and Regasification Unit
HGBT	Regulated Gas Price Policy
HHI	Herfindahl–Hirschman Index
IDD	Indonesia Deepwater Development
Jargas	City gas network
KESDM	Ministry of Energy and Mineral Resources of Indonesia (MEMR)
KPIP	Committee for Acceleration of Priority Infrastructure Delivery
KPPU	Indonesia Competition Commission
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
OSS	Online Single Submission (national licensing platform)
PLN	Indonesia's State-Owned Electricity Company
PSC	Production Sharing Contract
PSN	National Strategic Project
RIA	Regulatory Impact Assessment
RPJMN	National Medium-Term Development Plan
SKK Migas	Special Task Force for Upstream Oil and Gas Business Activities
SOE	State-Owned Enterprise
TPA	Third Party Access
Units	
BBTUD	Billion British Thermal Units per Day
KM	Kilometer
MMBTU	Million British Thermal Units
MMSCFD	Million Standard Cubic Feet per Day
TCF	Trillion Cubic Feet

## 1. INTRODUCTION

Natural gas has achieved renewed global importance in the energy transition as a transitional fuel bridging high-carbon and lower-carbon energy systems. Compared to other fossil fuels, it offers a cleaner combustion profile, emitting significantly less carbon dioxide per unit of energy produced (Bistline and Young, 2022; Daneshzand et al., 2018; Safari et al., 2019). This characteristic makes natural gas attractive for countries seeking to reduce emissions while retaining energy system reliability and industrial productivity. Its flexibility across power generation, industrial processes, and household applications ensures ongoing importance in diversified energy systems. Consequently, natural gas plays a strategic role in reinforcing energy security and supporting economic growth, as well as facilitating progress toward low-carbon targets (Cabalu, 2010; Kong and Hobbs, 2014; Ye et al., 2021).

Apart from environmental and security considerations, natural gas retains significant economic value. The expansion of gas infrastructure and markets supports industrial competitiveness, job creation, and investment, notably in emerging economies where growth remains energy-intensive (Hutagalung et al., 2020; US Energy Information Administration, 2017; Wang and Lin, 2014).

Natural gas also operates as a critical feedstock for industries such as fertilizers and petrochemicals, where substitution with alternative energy sources remains limited, reinforcing its central role in national energy and industrial policy (Kirat, 2021).

However, these benefits depend on how domestic gas markets are structured and governed. Allocation efficiency, pricing, and investment flows are controlled not only by resource endowment but by regulatory quality and institutional design. The International Energy Agency (IEA, 1998) identifies four stages of gas market development, ranging from monopoly to full retail competition. While countries such as the United States and the United Kingdom have reached advanced stages characterized by transparent pricing and open access (Swennen and Leuven, 2017; Weijermars, 2012), many developing economies—including Indonesia—remain dominated by state-owned enterprises controlling infrastructure, trading, and pricing (Hartono and Prasetyawati, 2023; Hutagalung et al., 2020; Muttaqin et al., 2018; Purwanto et al., 2016). Such concentration often constrains competition, weakens investment incentives, and leads toward inefficient resource allocation.

Extensive research on gas market reform shows that outcomes hinge on regulatory strength and sequencing. Advanced economies typically build competition via transparency and independent oversight, while emerging economies often adopt gradual, hybrid approaches that balance state control with selective market mechanisms (Boute and Fang, 2022; Kumar, 2020; Swennen and Leuven, 2017; Timitimi, 2022). Cross-country experience—from China's midstream restructuring and TPA agenda, Malaysia's subsidy rationalization and TPA framework, Brazil's New Gas Law to foster competition, to Nigeria's persistent "paradox of plenty" despite large reserves—also illustrate a recurring lesson: adopting "textbook" reforms on paper does not automatically deliver contestability when institutional barriers, monopoly legacies, and incomplete operational rules persist (Boute and Fang, 2022; IEA, 2021; Timitimi, 2022; Zainudin et al., 2020). Even mature markets such as the EU and Australia illustrate that governments may still intervene to manage domestic security and price exposure, highlighting the practical tension between market design and affordability/security objectives (Barnes, 2023; Bella et al., 2022; Roarty, 2008; Shi, 2018).

Indonesia's recurring natural gas shortages, curtailments, and allocation disputes are frequently framed as a supply problem (Reuters, 2025; Wood Mackenzie, 2025). Yet comparative reform experience indicates that "shortage outcomes" in regulation-heavy gas systems can also arise from how the market is governed: when allocation is discretionary, access conditions are opaque, and trading rules are weak, available gas may not flow to the highest-value uses or to contracted buyers in a predictable way. Existing international literature offers important insights onto reform pathways, tracking legal amendments, institutional restructuring, SOE roles, and headline price interventions, but it often assesses reform progress primarily by what is changed on paper rather than what becomes credible and workable in practice. In practice, contestability and investment depend on an operational market-design layer: transparent and auditable capacity and tariff information; enforceable and non-discriminatory third-party

access; rule-based balancing and congestion management; predictable curtailment protocols; and credible dispute resolution. A second limitation is that prior studies commonly treat stakeholder and public narratives as background context, even though these narratives shape enforcement choices, contracting behaviour, and the political feasibility of moving from administrative allocation to rule-based governance, especially when affordability objectives are pursued through administered pricing and priority allocation. These two gaps motivate an assessment that links formal regulation to operational governance and to the accounts that sustain (or constrain) enforcement credibility, thereby clarifying why partial reforms may persist and why efficiency outcomes could diverge from reform intent.

This paper fills that gap by pursuing three objectives: (i) to diagnose how administered pricing and allocation operate within a fragmented, corridor-based system under upstream maturity constraints; (ii) to explain persistence by integrating regulatory design, market-structure mechanisms, and narrative/legitimacy dynamics; and (iii) to derive transferable lessons on how affordability interventions can remain durable when coupled with a minimum operational market-design layer that reduces discretion, lowers transaction costs, and restores investable signals.

## 2. THE DYNAMICS OF INDONESIA'S NATURAL GAS INDUSTRY

Indonesia's natural gas sector has evolved through a sequence of development phases in which resource endowment interacted with geography, industrial policy, infrastructure connectivity, and governance design. The current market configuration—domestic prioritization amid recurring delivery tightness, does not reflect a single driver, but path dependence created by (i) an export-led LNG development strategy, (ii) corridor-based midstream integration rather than a fully integrated national grid, and (iii) an administrative governance approach in which allocation and regulated pricing have remained central instruments. This section narrates these dynamics by period, while tracking five market components in each phase: upstream supply, midstream infrastructure, demand orientation (exports versus domestic use), institutional arrangements, and pricing.

### 2.1. Export-Led Foundations and Early Domestic Anchoring (1880s-1999)

Indonesia's modern natural gas development began with early discoveries (North Sumatra in 1883; Kalimantan in 1893) and expanded with the discovery of the Raja field in South Sumatra (1958), which supported the Sriwijaya Fertilizer (PUSRI) plant from 1964—one of the earliest domestic anchor uses. Major discoveries in the early 1970s—Arun (North Sumatra, 1971) and Badak (East Kalimantan, 1972)—then positioned Indonesia among the earliest global LNG exporters and accelerated upstream growth (Fred von der and Lewis, 2006; Sanusi, 1985; Wijarso, 1983).

In this formative phase, the binding constraint was not reserved but deliverability. Large fields were located far from major demand centers, and the archipelagic geography made a unified pipeline

system capital-intensive. LNG export projects, therefore, became the pragmatic monetization pathway for stranded gas, delivering scale and revenue while embedding an export-oriented structure (Wijarso, 1983; Sanusi, 1985). Pricing during this period remained largely benchmark-referenced and sector-differentiated: domestic prices were initially pegged to US gas prices and rose as fertilizer demand expanded, with wide variation across consumer classes by the mid-1980s (Wijarso, 1983; Directorate General of Oil and Gas Department of Mines and Energy, 1990).

### 2.2. Reform-Era Institutional and Corridor-Based Domestic Market Formation (2000-2009)

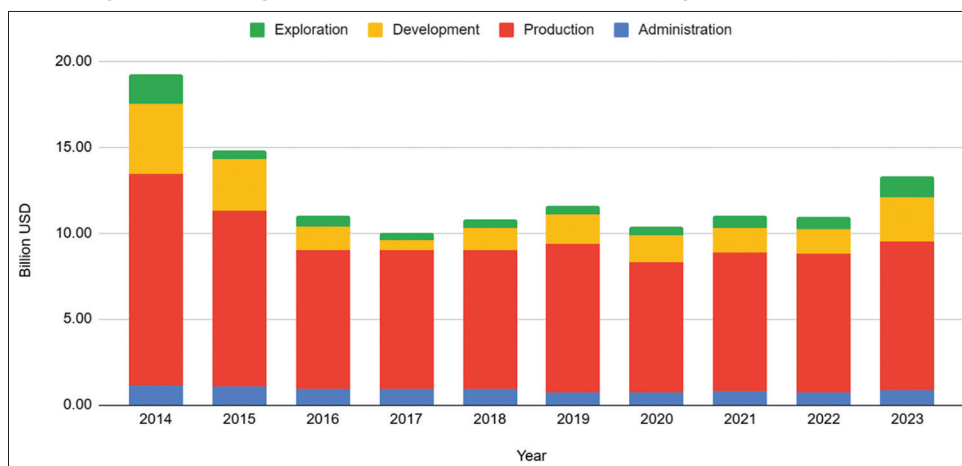
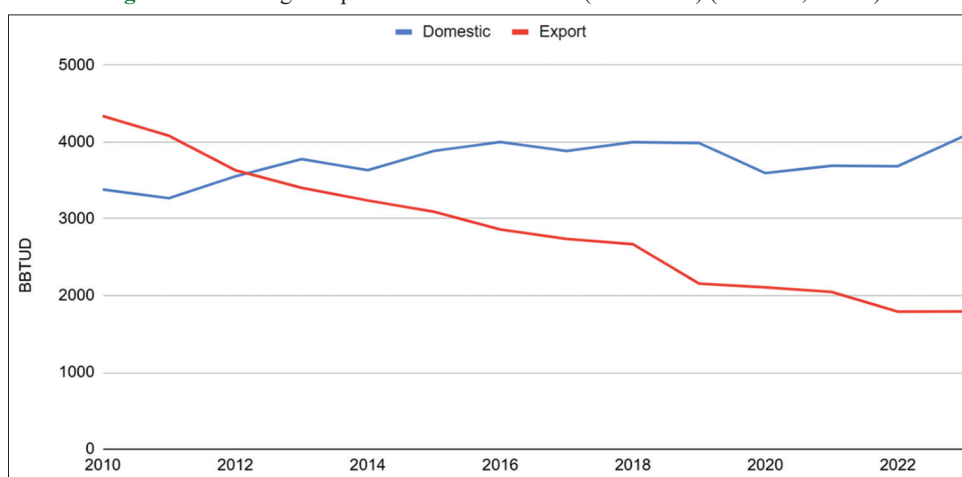
The early 2000s introduced a governance architecture intended to separate roles and improve oversight. Law No. 22/2001 formalized a split between upstream and downstream functions; downstream transportation regulation was subsequently strengthened through the establishment of BPH Migas (often cited as a key milestone for pipeline governance), while upstream operational oversight remained centralized through the implementing agency arrangement (later institutionalized as SKK Migas). While the formal separation signaled modernization, domestic market functionality continued to depend on coordinated volumes rather than competitive procurement (Butt and Edward Siregar, 2013; Dutu, 2016; Hutagalung et al., 2019).

On the infrastructure side, domestic development expanded as a corridor system anchored in western demand centers. Early pipeline investments—such as the 370 km pipeline connecting Cirebon and Cilegon—supported industrial clusters (steel, cement, fertilizer) and residential distribution in West Java (Directorate General of Oil and Gas Department, Department of Mines and Energy, 1990). This corridor logic persisted and strengthened with the South Sumatra–West Java transmission corridor (SSWJ), which became a backbone for delivering South Sumatra gas to West Java's industrial and power users. Technical studies of the SSWJ network show that the corridor's capacity limitation during peak demand have historically been managed through LNG injection/regasification as a supplementary supply source, highlighting early dependence on LNG as a balancing

**Table 1: Natural gas reserves and production (KESDM, 2018; SKK Migas, 2020; KESDM, 2023b; SKK Migas, 2024; KESDM, 2014)**

Year	Proven+Potential Reserves (TSCF)	Production (MMSCFD)
2010	157.1	8,857
2011	152.9	8,415
2012	150.7	8,149
2013	150.4	8,130
2014	149.3	8,218
2015	151.3	8,078
2016	144	7,937
2017	142.7	7,620
2018	135.5	7,764
2019	77.3*	7,235
2020	62.4*	6,665
2021	60.6*	6,668
2022	54.8*	6,492
2023	54.7*	6,630

\*: calculation adjustment

**Figure 1:** Oil and gas investment trend (2014-2023) (SKK Migas, 2018; 2019; 2024)**Figure 2:** Natural gas export versus domestic use (2010-2023) (KESDM, 2023b)

substitute for limited pipeline flexibility (Utama et al., 2024; Kimura, 2021).

This period also marks the rise of a “third LNG center” in eastern Indonesia. Technical appraisal work for Tangguh (Papua) illustrates how frontier LNG projects required multi-year discovery–appraisal–authorization processes to meet long-term marketing and investment thresholds; the Tangguh resource was certified in the late 1990s and acts as a cornerstone of Indonesia’s eastern LNG expansion (Marcou et al., 2004). The wider implication is that LNG remained central not only as an export channel but as the development solution for remote gas resources—reinforcing geographic mismatch between producing regions and Java–Sumatra demand centers.

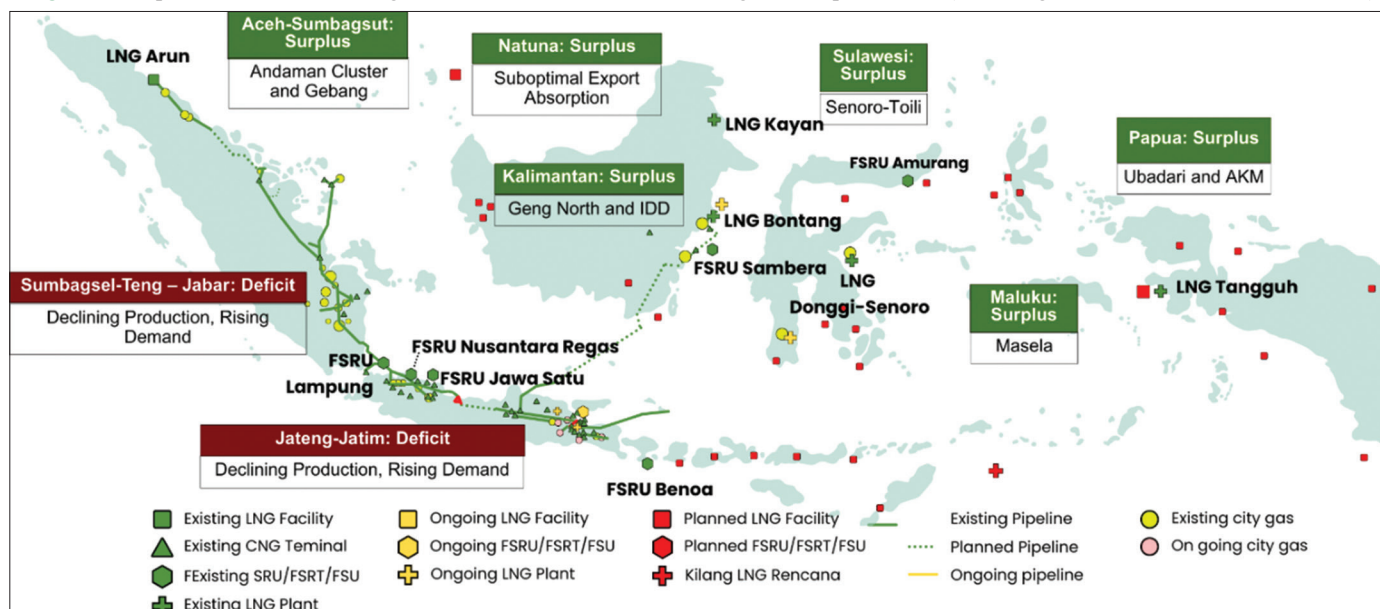
### 2.3. Production Maturity and the Export-to-Domestic Pivot (2010-2019)

By the 2010s, Indonesia entered a maturity phase in which supply growth became harder to sustain, while domestic policy increasingly prioritized energy security for strategic sectors. Production peaked at 8,857 MMSCFD in 2010 (SKK Migas, 2019) and then plateaued. Table 1 shows a sustained decline from 8,218 MMSCFD (2014) to 6,665 MMSCFD (2020), stabilizing around 6,492-6,630 MMSCFD during 2021-2023, alongside a declining

total reserves profile (Proven + Potential) (KESDM, 2014; 2018; 2023b; SKK Migas, 2020; 2024). These trends indicate constrained replenishment and growing dependence on mature fields.

As output maturity increased, upstream spending became increasingly skewed toward sustaining production rather than expanding the discovery pipeline. Figure 1 shows that production expenditure dominates investment through 2014-2023, while exploration remains comparatively small relative to development and production (SKK Migas, 2018; 2019; 2024). This composition is consistent with a structural reality highlighted in the literature on developing-country gas markets: remaining resources are increasingly located in technically challenging or higher-cost settings, requiring price credibility, stable regulation, and access to reliable markets to justify development (Rawat and Garg, 2021).

Demand orientation shifted decisively in the same decade. Figure 2 shows exports falling from 4,336 BBTUD (2010) to 1,794 BBTUD (2023), while domestic utilization remains relatively resilient (~3,300-4,100 BBTUD), with domestic demand overtaking exports around 2012-2013 (KESDM, 2023b). This reorientation is consistent with the allocation regime introduced under KESDM Regulation No. 3/2010, later reinforced by No. 6/2016, which prioritizes domestic users (notably the power sector, fertilizer, and

**Figure 3:** Map of Indonesia's natural gas infrastructure distribution and regional surplus-deficit (SKK Migas, 2025; KESDM, 2023a; 2023b)**Table 2: Natural gas utilization by sector (2025)**  
(SKK Migas, 2025)

No	Sector	Volume (BBTUD)	No	Sector	Volume (BBTUD)
1	Industry	1.417,76	6	Pipeline Gas Export	412,64
2	LNG export	1.316,24	7	Lifting	204,82
3	Domestic LNG	739,76	8	LPG	96,90
4	Power plant	735,99	9	City Gas	12,70
5	Fertilizer	687,24	10	BBG	8,42

industry) and formalizes domestic market obligations and trader requirements (KESDM, 2023a).

Importantly, the export-to-domestic pivot occurred without a transition to transparent market-based balancing. Administrative allocation became the primary coordination mechanism, which can secure priority supply in the short run but tends to shift risk into contracting and investment when reallocations are discretionary and when infrastructure cannot flexibly reroute volumes across regions (Hutagalung et al., 2020; Hutagalung et al., 2019; Muttaqin et al., 2018).

This phase also illustrates how new LNG projects can expand supply without automatically resolving domestic corridor tightness. Donggi-Senoro LNG (Central Sulawesi) began operating in 2015 as a single-train LNG facility developed as a downstream business activity under the post-2001 framework, reinforcing LNG's continuing role in monetizing remote resources (Satria et al., 2023). The wider market implication is continuity rather than rupture: LNG expansion adds capacity and export optionality, but domestic reliability still depends on midstream integration and access governance in the main demand corridors.

#### 2.4. Administered Pricing and Supply-Demand Mismatch (2020-Present)

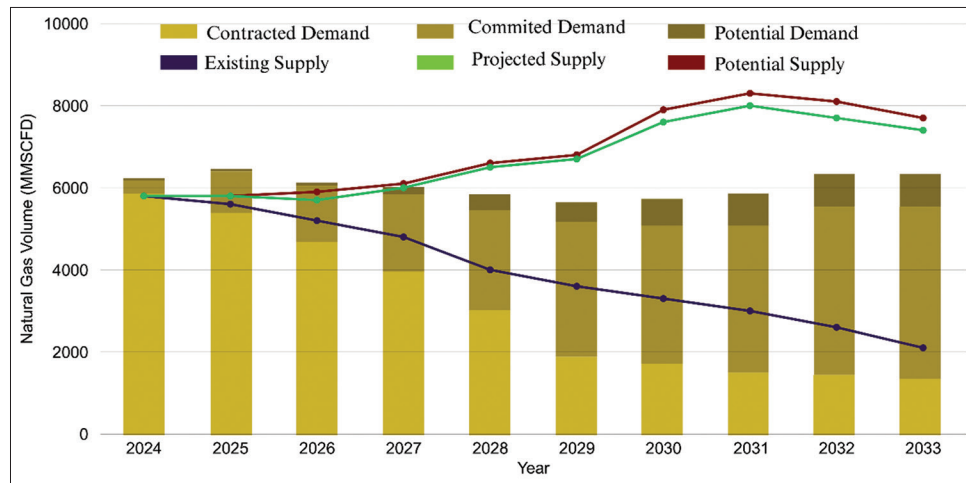
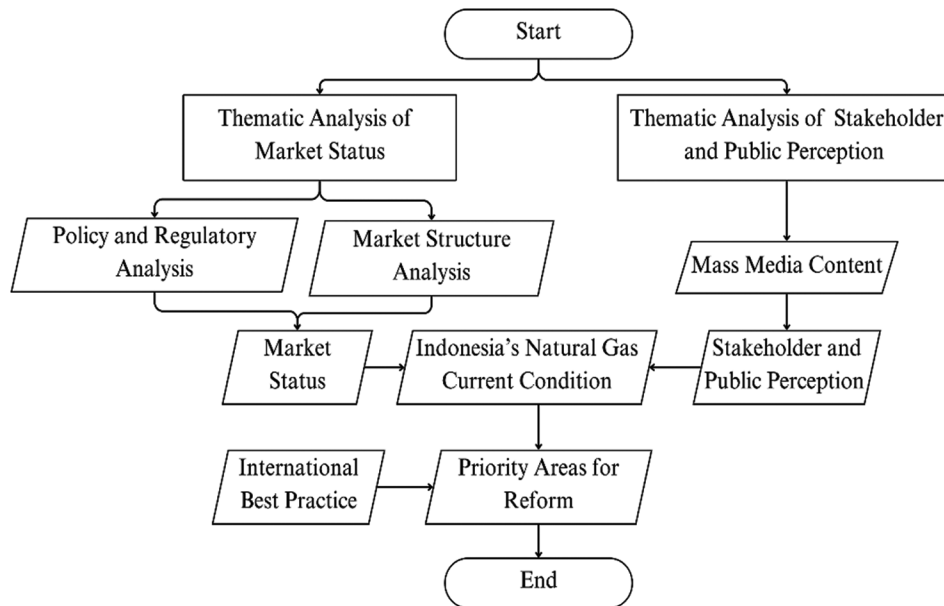
The 2020s intensified the policy emphasis on affordability and domestic prioritization through regulated gas price policy

and continued allocation steering. While the detailed pricing architecture is analyzed later, the key historical point for this section is that price intervention became an increasingly central governance instrument while physical fragmentation and mature supply factors tightened deliverability.

Indonesia's midstream footprint expanded, but integration remained uneven. As of 2025, Indonesia operates 22,543.98 km of pipelines across 16 licensed entities, including transmission, distribution, and city gas networks; utilization is uneven, with only about 30% of pipelines operating above 60% capacity, consistent with regional imbalances and limited rerouting capacity (BPH Migas, 2025). In parallel, LNG infrastructure remained material: Indonesia maintains four active LNG plants (16 Mtpa total capacity) and six regasification terminals (850,356 m<sup>3</sup>), reinforcing LNG's capacity as both export infrastructure and a domestic balancing substitute (KESDM, 2023b). Figure 3 visualizes this spatial configuration, indicating that major infrastructure is largely concentrated along high-consumption corridors, yet the system remains corridor-dependent and unevenly interconnected throughout regions, limiting interregional flexibility and the ability to reroute supply during shocks (KESDM, 2023b, 2023a; SKK Migas, 2025).

Domestic utilization also became more diversified but remained determined by bottlenecks. Table 2 shows that industry is the dominant consumer (1,417.76 BBTUD), followed by power (735.99 BBTUD) and fertilizer (687.24 BBTUD). A key signal of fragmentation is the substantial volume allocated to domestic LNG (739.76 BBTUD), indicating that LNG continues to substitute for limited interregional pipeline connectivity and constrained corridor flexibility (SKK Migas, 2025).

Against this backdrop, supply stress re-emerged in the main demand corridors. Since 2024, shortages have appeared in Sumatra and Java, in line with a natural decline in major western supply sources (including the Corridor Block) and limited flexibility

**Figure 4:** Indonesia's gas balance (SKK Migas, 2025)**Figure 5:** Flowchart diagram of methodology

to rebalance volumes across the network. Figure 4 shows that while demand remains relatively stable at around 5,800-6,400 MMSCFD, declining production from existing fields increases reliance on the timely delivery of new upstream developments to avoid sustained deficits (SKK Migas, 2025).

Looking forward, the supply pathway increasingly depends on complex frontier projects, many of which are in eastern deepwater settings with higher costs and longer lead times. Projections imply a potential temporary rebalancing around 2029-2031 if planned projects—such as Masela, Natuna, and deepwater developments—are delivered on schedule (SKK Migas, 2024). Technical literature on the Abadi (Masela) field illustrates why this is challenging; the field's remote deepwater setting requires capital-intensive development solutions and has historically been evaluated through alternative LNG concepts to monetize frontier gas (Manabe et al., 2009). The implication for Indonesia's near-term market situation is that administrative allocation and price intervention are operating in a context where physical connectivity constraints

and upstream maturity are tightening deliverability—making governance credibility, infrastructure sequencing, and investment incentives increasingly central to domestic reliability.

### 3. METHODOLOGY

The study adopts a qualitative single-case approach and applies thematic analysis to triangulate evidence on (i) policy and regulatory design and implementation, (ii) market structure and operational governance mechanisms, and (iii) stakeholder and public narratives in Indonesia's natural gas sector. Following an iterative thematic procedure (Braun and Clarke, 2008), the analysis moved from familiarization with the corpus to coding, theme development, theme review, and cross-source synthesis. The subsections below specify how each analytical track was implemented.

Two analytical tracks were conducted in parallel (Figure 5): (1) A regulatory and market-structure diagnosis and (2) a stakeholder

and public-perception analysis. The evidence base combines three qualitative corpora. First, a document corpus of laws and implementing regulations governing upstream–downstream roles, gas allocation, pricing, licensing, and midstream access (including third-party access provisions), complemented by official plans, statistics, and technical guidelines from relevant agencies (e.g., KESDM, SKK Migas, and BPH Migas). Second, primary data from 11 semi-structured interviews with experts and practitioners representing regulators, operators across the value chain (including, where represented, midstream pipeline and LNG/regasification operations), industrial users, and business associations, complemented by two focus group discussions (FGDs) involving an upstream association and downstream stakeholders. Third, a structured mass-media content dataset of 889 articles from 17 national print and digital outlets published between 2020 and mid-2025 was compiled to trace the evolution of debates on gas pricing, supply conditions, and reform priorities in the period following the introduction of regulated gas pricing and the emergence of domestic supply tightness.

### 3.1. Thematic Analysis of Market Structure

The first analytical track examines the structural and institutional features that shape Indonesia's natural gas market through two interrelated components. The policy and regulatory analysis applies the APEC-OECD Integrated Checklist on Regulatory Reform to assess regulatory quality, transparency, competition, and market openness (OECD, 2005) O. This framework was operationalized as thematic codes covering regulatory reform, regulatory policy, competition policy, and market openness policy.

The market structure analysis draws on industrial organization theory Pindyck and Rubinfeld (2018) to assess key economic characteristics of the gas market, including supply and demand elasticities, market concentration, interactions and market conduct, pricing mechanisms, infrastructure access, and information asymmetry. Together, these dimensions provide a holistic assessment of competition, efficiency, and investment incentives, and help identify structural rigidities—such as concentration, weak third-party access, and distorted price signals—that contribute to supply bottlenecks and underinvestment.

In addition, the study explicitly classified Indonesia's current market status using the IEA (1998) stages of gas-market development and a network-industry governance lens (monopoly/pipeline-to-pipeline competition/wholesale market competition/full retail competition), providing a reference for interpreting subsequent structural findings.

### 3.2. Thematic Analysis of Stakeholder and Public Perception

The second analytical track explores how regulatory arrangements, pricing policies, and governance challenges are perceived by stakeholders and reflected in public discourse. Media content analysis was conducted on 889 articles published between 2020 and mid-2025, categorized into six thematic areas: supply and production, infrastructure, consumption, economics, policy, and gas pricing (Table 3). This dataset captures the interaction between public narratives and elite debates, giving insight into the legitimacy and contestation surrounding Indonesia's gas policy.

**Table 3: List of mass media**

No	Mass media name	Total article	No	Mass media name	Total article
1	Bisnis Indonesia	411	9	CNN Indonesia	1
2	Dunia Energi	2	10	Detik	2
3	Jakarta Post	96	11	The Strait Times	1
4	Kompas	92	12	CNBC Indonesia	1
5	Kontan	261	13	Berita Jatim	1
6	OG Indonesia	6	14	Warta Ekonomi	1
7	Ruang Energi	4	15	Media Indonesia	2
8	Tempo	7	16	The Economist	1
Total Article					889

**Table 4: Policy and regulation analysis pain points**

No	Dimension	Pain points
1	Regulatory reform	<ol style="list-style-type: none"> <li>1. The separation of regulatory and policy roles has not been followed by substantial market liberalization.</li> <li>2. Government control over prices and allocation has increased, reversing earlier liberalization efforts.</li> <li>3. The revision of Oil and Gas Law has been stalled for over a decade, with gas still not recognized as a strategic commodity.</li> </ol>
2	Regulatory policy	<ol style="list-style-type: none"> <li>1. Regulations are issued without proper assessment, leading to fiscal losses and limited benefits to end users.</li> <li>2. Sudden policy or regulation changes undermine investor confidence and predictability of policies.</li> <li>3. Infrastructure projects require complex permits from multiple agencies.</li> <li>4. Ambiguities between institutions and ministries result in duplicated responsibilities and inconsistent regulatory enforcement.</li> </ol>
3	Competition policy	<ol style="list-style-type: none"> <li>1. While a Constitutional Court ruling allows for competition, it also mandates continued state control.</li> <li>2. Weak enforcement of TPA and incomplete unbundling prevent fair competition and hinder entry for independent players.</li> <li>3. Allocation decisions lack transparency, objective criteria, and competitive mechanisms.</li> </ol>
4	Market openness policy	<ol style="list-style-type: none"> <li>1. Despite improved production sharing contract (PSC) terms and fiscal incentives, competition in the upstream competition remains limited.</li> <li>2. Transmission rights are limited to one licensed entity per route, with weak enforcement of TPA.</li> <li>3. The lack of real-time capacity data, price transparency, and a public trading platform discourages new entrants in market.</li> <li>4. LNG receiving and regasification capacity is primary located in western Indonesia.</li> </ol>

Findings from both thematic analyses were initially examined separately through open and axial coding, and then integrated through a cross-thematic integration method. This aggregation yielded a composite analytical map that illustrates the interrelationships among policy design, institutional coordination, and market behavior. Reform priorities were identified by comparing the integrated findings with international best practices in competitive gas market governance, drawing on experiences from the United States, the European Union, China, and Malaysia.

## 4. RESULTS AND DISCUSSION

The analysis of results is synthesized through the integration of three complementary evidence streams: policy and regulatory arrangements, market structure and conduct, and stakeholder/public narratives. These lenses are presented separately to preserve analytic transparency, but the interpretation is explicitly cross-cutting: each issue is traced from the formal rules and institutional mandates that shape incentives and access conditions, to the market outcomes those incentives produce, and finally to how those outcomes are experienced and contested through narratives of affordability, reliability, and equity.

### 4.1. Policy and Regulation

The evaluation summarized in Table 4 suggests that Indonesia's gas-market governance remains unable to generate contestable and efficient outcomes because four regulatory deficits reinforce one another: stalled structural reform, inconsistent regulatory policy, weak competition enforcement, and limited market openness. These deficits operate through an increasingly administrative mode of coordination: government regulation of pricing and allocation has intensified, major interventions are introduced without systematic assessment, and overlapping institutional mandates blur decision rights and weaken policy coherence. In this setting, market access is not constrained by a single barrier but by a bundle of mutually reinforcing frictions—SOE dominance, incomplete unbundling, weakly operationalized third-party access, and persistent information asymmetries as administrative allocation further restricts entry and competitive pressure. Regulated gas pricing worsens the problem by disconnecting prices from production and delivery costs, thereby weakening investment incentives and amplifying regulatory uncertainty. Complex licensing procedures and discretionary policy adjustments—commonly shaped by political and business pressures—heighten these distortions and increase transaction costs. Consequently, despite stated commitments to market-based reforms, the absence of transparent information systems, adequate LNG infrastructure, and competitive allocation mechanisms continues to limit market functionality and resilience.

#### 4.1.1. Regulatory reform

Indonesia's post-1998 energy reforms—triggered by the Asian financial crisis—were institutionalized in Law No. 22/2001. This law separates upstream and downstream activities and divides functions between policy and oversight. KESDM, through the Directorate of Oil and Gas retains rulemaking authority; upstream operations were initially managed by BP Migas (later SKK Migas), and midstream pipeline regulation falls under BPH Migas. This institutional design is, in principle, consistent with network-industry governance that separates policy-making from regulatory supervision and commercial/operational roles, thereby reducing conflicts of interest and improving accountability.

However, in practice, the institutional split did lead to the reform. Instead, Indonesia increased administrative control over prices and gas allocation, reducing market coordination. This approach made investment and contracting more responsive to discretion rather than scarcity signals, resulting in a “form-without-function”

outcome. Constitutional jurisprudence under Article 33 outlines the boundaries: Decision No. 002/PUU-I/2003 permitted competition only if state control remained effective. Decision No. 36/PUU-X/2012 replaced BP Migas with SKK Migas, showing that institutional designs can be judicially corrected if they weaken state authority.

Legislative stagnation has compounded these problems. Amendments to Law No. 22/2001 have stalled since around 2010, limiting statutory clarity on mandate reassignment, enforcement strengthening, and key governance functions like access neutrality, transparency obligations, and dispute resolution. According to OECD terms, the main constraint is weak policy-cycle discipline, which reduces transparency in trade-offs among affordability, investment, and allocation versus contract certainty (OECD, 2002a).

International experience provides insight into the functional requirements for operational reform in integrated systems: Malaysia implements TPA with codified access products and regulator enforcement (Lim and Goh, 2019; Zainudin et al., 2020). China's establishment of PipeChina (China Oil and Gas Pipeline Network Corporation)—a national midstream operator formed through the consolidation of major trunk pipelines and LNG terminal assets previously held by the national oil companies—illustrates midstream restructuring designed to improve third-party access under continued state ownership demonstrating infrastructure governance reforms to broaden access under state ownership (Swennen and Leuven, 2017). The UK incorporates access and transparency obligations through licensing and Ofgem oversight, including LNG access (Broadstock and Wang, 2020; Herweg et al., 2018; OECD, 2002b). The key lessons are that credible reform necessitates rule-based access, transparent information duties, and enforceable compliance to reduce discretion and enhance allocation efficiency and supply security.

#### 4.1.2. Regulatory policy

Indonesia's natural gas governance relies on price intervention and administrative allocation rather than market-based price discovery and transparent producer-buyer matching. Under the APEC–OECD lens, this signals weaknesses in efficiency, transparency, and accountability, as major interventions are rarely anchored in a disciplined ex-ante/ex-post policy cycle.

For domestic pipeline gas (excluding LNG regasification), pricing is governed by RCS/RBC cost-and-return regulation. MEMR Regulation No. 58/2017 (amended by No. 14/2019) locks in the framework through caps on infrastructure returns (IRR 11% USD) and trading costs (7%), standardized volume and project-life assumptions ( $\geq 60\%$  capacity;  $\geq 30$  years), and a maximum weighted-average reference price. While these parameters improve cost controllability, they reduce flexibility and can compress incentives for midstream efficiency and infrastructure investment—critical in a system facing spatial mismatch and reliability constraints.

Regulated gas price policy deepened administrative price formation. Presidential Regulation No. 40/2016 set a US\$6/

MMBtu cap for priority industries, expanded by Presidential Regulation No. 121/2020 (including power and infrastructure tariff adjustments), implemented via MEMR Regulation No. 8/2020 → No. 15/2022 and decrees including MEMR Decree No. 76K/MG.01/MEM.M/2025. In practice, regulated gas price policy often uses a netback method, fixing a plant gate target and treating the residual as implicit midstream cost—turning network remuneration into a policy residual rather than a function of efficiency and investment risk. This weakens expansion incentives and is consistent with dominant stakeholder concerns regarding economic viability and supply certainty, consistent with limited assessment and incomplete cost–benefit scrutiny. OECD/IEA guidance treats RIA, incidence analysis, and periodic review as guardrails for such interventions.

Supply reliability is also governed top-down through allocation rules, MEMR Regulation No. 3/2010, refined by No. 6/2016, giving priority to domestic users (power, fertilizer, households) and formalizing allocation/reallocation procedures. The regime remains administrative, without an open matching platform or transparent criteria, so reallocations can raise volume risk and weaken contractability—especially when policy modification is abrupt.

Two systemic frictions reinforce the equilibrium: complex multi-agency permitting (despite OSS) slows infrastructure expansion, and mandate ambiguity among KESDM, SKK Migas, and BPH Migas sustains discretionary coordination, particularly on access, transparency, and balancing. Price-and-allocation interventions require guardrails. International experience shows that administrative pricing and priority allocation become less distortionary when they are disciplined by a routine ex-ante/ex-post policy cycle, coupled with access neutrality and a minimum transparency infrastructure (capacity, tariffs, congestion) that enables rule-based balancing rather than discretionary reallocation.

#### 4.1.3. Competition policy

Indonesia's competition policy in natural gas is formally anchored in Law No. 22/2001, which aimed to transition the sector from a state-centric monopoly to a more productive structure that allows for competition. However, in practice, competition remains largely nominal: due to the dominance of SOE across the value chain, political intervention in pricing and allocation, and overlapping mandates that limit contestability. This is in line with OECD benchmarks for network industries, which emphasize non-discriminatory access to fundamental infrastructure, transparent information, and preventing foreclosure as essential factors for effective competition.

A major institutional boundary is Constitutional Court Decision No. 002/PUU-I/2003, which overturned provisions that would have allowed market mechanisms to shape domestic gas and petroleum fuel prices. The Court ruled that prices should be set by the government, taking into account social interests and equitable competition. It also clarified that competition is only permissible if it does not undermine state control under Article 33, which covers the authority to regulate, administer, manage, and supervise vital

sectors. This boundary is further supported by Law No. 1/2025, which allows the President to grant exclusive rights or monopolies to SOEs in essential sectors.

Within this system, the KPPU has limited influence in the gas sector. Coordination with Directorate of Oil and Gas under KESDM and SKK Migas is not institutionalized, and competition enforcement in the upstream and midstream sectors is weak compared to the role of the government in forming the market. Despite having 69 PSC holders, more than half of production is controlled by the Pertamina Group, and access to acreage and data is perceived as opaque and biased towards SOEs.

Midstream dominance is even more prevalent with PGN and Pertagas owning over 90% of transmission and distribution. Infrastructure remains closely tied to trading interests, leading to conflicts of interest. In this context, formal TPA provisions do not ensure neutrality, as incumbents can control capacity, access terms, and interconnection. International best practice recommends effective TPA and unbundling to address the risk of foreclosure posed by dominant essential facilities and vertical integration.

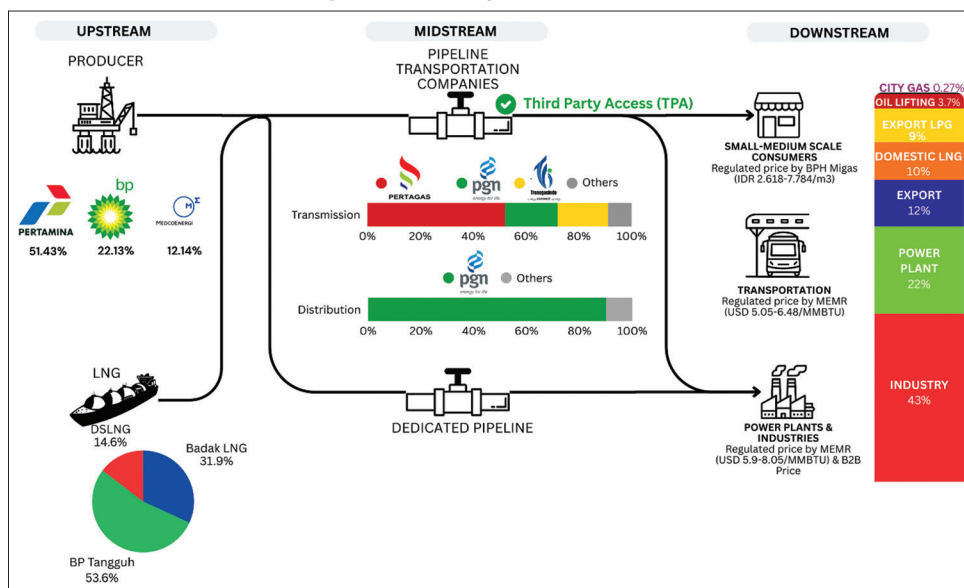
Pricing and allocation policies additionally compound these constraints. Government-imposed pricing hinders price discovery and investment incentives, while discretionary allocation without published clear criteria increases uncertainty and contract risk perceptions. These factors highlight five competition-policy concerns: price controls distort transparency as well as investment signals, the competition authority lacks leverage and coordination, structural dominance and vertical integration limit access, weak TPA and incomplete unbundling hinder entry, and allocation decisions lack transparent criteria and competitiveness.

#### 4.1.4. Market openness policy

Market openness concerns pertain to who can enter a market and whether those entrants can obtain access to the main infrastructure and market information. In Indonesia's natural gas sector, while openness is allowed by law, it is limited in practice, resulting in a selective and biased entry system that favors incumbents. This is primarily significant in an archipelagic system where demand is concentrated in Java–Sumatra, and the availability of gas depends on the cost of the project and LNG price flexibility. In such conditions, access regulations and transparency play a crucial role in investment diversification and ensuring a reliable gas supply. Despite the existence of permissive PSC contracting frameworks such as Gross Split and Cost Recovery, upstream openness remains limited. Investment is primarily focused on improving existing fields, with a decline in new exploration projects in 2013. This indicates that having various contract types is not enough to promote competition without a clear governance structure and transparent access to available acreage and subsurface data.

Midstream openness is hindered by restrictive licensing practices and ineffective TPA implementation. Regulation No. 4/2018 stipulates exclusive transmission licenses based on specific routes and requires pipeline ownership, which restricts TPA participation. Even when TPA is allowed, enforcement is inconsistent and

Figure 6: Current gas market structure



selective, with a lack of a national real-time capacity and tariff disclosure system. Without standardized information on capacity, tariffs, and congestion, potential entrants are unable to assess or negotiate access fairly, undermining the fundamental principle of market openness seen in EU/UK or IEA member countries' market governance.

Downstream openness is further limited by opaque administrative allocation processes and a lack of transparency. Supply allocation can be made through discretionary methods without public auctions or clear criteria, and the National Gas Balance does not function effectively as an indicator for market participants, weakening contract and market efficiency. While imports are legally possible, they are restricted by policy and operational obstacles. Indonesia does not have an open LNG or pipeline import market, as imports require specific approvals and designated importers endorsed by KESDM. Without an import market and transparent domestic capacity information, incumbents face less competition, and new entrants struggle to find alternatives for supply options. Lastly, there is an imbalance in regional distribution and infrastructure development that intensifies selective openness. LNG receiving and regasification facilities are mainly located in western Indonesia, while delays in major upstream projects increase reliance on LNG flexibility. However, bureaucratic obstacles slow down the development of FSRUs and import terminals, leading to an outcome of asymmetric openness where LNG plays an important role in balancing supply, but access to development opportunities is hindered by bureaucratic complications rather than explicit regulations.

## 4.2. Market Structure

This subsection translates the institutional and regulatory diagnosis into market outcomes using two complementary lenses: industrial-organization (structure and conduct in a network industry) and the IEA (1998) stages of gas-market development. Viewed through these lenses, Indonesia's natural gas sector is best characterized as a hybrid market that once moved toward early liberalization on paper but has since experienced operational backsliding. In

other words, the post-2001 architecture introduced formal role separation and recognized TPA, yet subsequent governance has increasingly relied on administered prices and discretionary allocation rather than on rule-based access and market-based balancing.

Figure 6 maps how this trajectory materializes structurally. The sector remains dominated by vertically integrated SOEs across upstream production, transmission and distribution infrastructure, LNG regasification, and key downstream segments. While TPA exists in the formal framework, it has remained partial and weakly operationalized, implemented unevenly, and without the minimum market-design infrastructure required for contestability. The interaction of vertical integration and weak access neutrality produces a closed and inflexible market architecture that restricts entry, limits competitive discipline, and reduces the system's capacity to adjust to shifting supply-demand conditions.

To diagnose the drivers of this inefficiency problem, this subsection integrates evidence across three structural dimensions:

1. The composition and interaction of market participants,
2. Supply and demand elasticity,
3. Pricing and regulatory governance, and

The results are later triangulated against stakeholder and public narratives to test how the identified market structure is experienced, interpreted, and responded to by market actors.

### 4.2.1. Market participants

Indonesia's natural gas sector is numerically diverse, but functionally concentrated across the value chain. This matters in a network industry: OECD/IEA experience shows that rivalry depends less on the number of licensees than on non-discriminatory entry to essential facilities (pipelines, LNG receiving, regasification), credible neutrality safeguards (unbundling or equivalents), and transparent capacity/tariff information. Where these are weak, concentration is reinforced,

**Table 5: Summary of natural gas participants along the value chain**

Segment	Number of market participants	Dominant player(s) (%)	HHI index	Interaction dynamics
Upstream	69 PSC holders	Pertamina (51.43%)	4331	Smaller contractors in marginal fields; high entry barriers
Midstream	15 transmission pipeline companies	Pertagas (52)	3546	Mandatory TPA and financial unbundling
	32 distribution pipeline companies	PGN (90)	8200	No mandatory TPA
	5 LNG companies	BP Tangguh (53.5)	4095	No mandatory TPA, mostly integrated with upstream projects
	6 regasification companies	PT Perta Arun Gas (59.75)	4206	No mandatory TPA, most regas assets tied to specific buyers
Downstream	10 sectors	Industry including fertilizer (43)	1896	Regulated pricing and allocation

**Table 6: Elasticity estimates for production, domestic demand, and exports relative to JCC**

Elasticity measure	Production	Domestic demand	Exports
Mean annual midpoint elasticity	0.2018	-0.1353	0.2957
Median annual midpoint elasticity	-0.0133	-0.0267	-0.0323
Full-sample log-log elasticity	0.0012	-0.0630	-0.6527

and coordination shifts toward administrative allocation.

Upstream plurality masks concentrated control. Figure 6 shows that Pertamina produces 51.43% of national gas, followed by BP (22.13%) and Medco (12.1%). Despite 69 PSC holders, the upstream HHI is 4,331 (Table 5), indicating high concentration. Smaller PSCs are largely confined to marginal fields, encountering higher risk, weaker bargaining power, and restricted or uncertain access to midstream evacuation and processing—conditions that suppress contestability even when fiscal contract options exist.

The LNG segment is similarly concentrated: BP Tangguh (53.6%), Badak LNG (31.9%), and DSLNG (14.6%), with HHI 4,095 (Table 5). Concentration and long-term contracting reduce LNG's capacity to function as a flexible balancing tool, consistent with IEA evidence that flexibility requires multi-user regas access and the ability to divert cargoes and trade short-term volumes (IEA, 2009; 2023).

Midstream vertical integration is the binding bottleneck. Table 5 indicates Pertagas holds 52% of transmission among 15 operators (HHI 3,546), while PGN controls ~90% of distribution among 32 operators (HHI 8,200). The problem is not the number of firms, but infrastructure ownership concentration coupled with trading interests, which creates foreclosure risk. Although TPA is regulated (mandatory in transmission), Figure 6 and the broader diagnostics suggest operational access is often theoretical: access terms remain discretionary, and no real-time capacity registry exists to standardize information on available capacity, congestion, tariffs, and outages. In reforming gas systems, TPA credibility depends on published capacity products, tariff transparency, enforceable access codes, and dispute resolution; without these, TPA cannot be operationalized at scale.

Regasification and LNG receiving assets are also concentrated and largely dedicated. Table 5 reports six regasification companies, dominated by PT Perta Arun Gas (59.75%; HHI 4,206), and

five LNG companies, dominated by BP Tangguh (HHI 4,095), with no mandatory TPA and many regasification assets tied to specific buyers. This limits secondary access (slot reallocation) and prevents LNG infrastructure from functioning as a shared balancing platform. Asian reform experience illustrates the functional remedy: Malaysia's TPA regime treats regasification and pipelines as multi-user facilities governed by codified rules, while China's midstream restructuring and hub development aim to widen infrastructure access under state ownership.

Downstream consumption is diversified (ten sectors), with industry accounting for 43% of demand and power 22% (Figure 6), and a lower downstream HHI (Table 5). Yet buyers remain largely captive due to regulated pricing, limited supplier choice, and the absence of wholesale or secondary trading markets. Even large off-takes such as PLN rely on centrally assigned allocations rather than commercially negotiated procurement. Overall, Figure 6 and Table 5 depict a structurally integrated system where concentration, vertical integration, weak access governance, and limited transparency constrain contestability and competitive discipline.

#### 4.2.2. Supply and demand elasticity

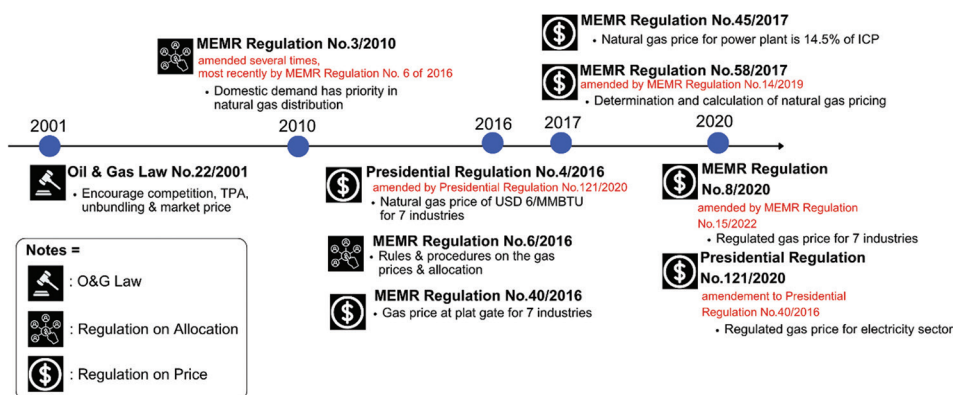
International evidence shows that gas supply and demand are generally inelastic in the short run, becoming more responsive only over longer horizons as investment, infrastructure, and substitution options adjust (Burke and Yang, 2016; Chai et al., 2018; Ponce and Neumann, 2014). For Indonesia, this implies that large contemporaneous quantity responses to price movements should not be expected; the more relevant question is whether the institutional and market framework enables adjustment over time or instead locks the system into administratively managed allocation.

To examine this, this study applies two elasticity diagnostics to the national series of gas production, domestic consumption, and exports, using the Japan Crude Cocktail (JCC) as the external price proxy. First, annual midpoint elasticities are used to capture year-to-year responsiveness between discrete observations (Chen, 2017). Second, full-sample log-log slope elasticities ( $\Delta \ln Q / \Delta \ln P$ ) are estimated to provide an aggregate constant-elasticity summary (Krishnamurthy and Kriström, 2015; Ravallion, 2010; Rouhani et al., 2022).

The results, as shown in Table 6, point to a broadly rigid adjustment structure. For supply, the annual midpoint estimates show an

**Table 7: Policy implications gap matrix**

Current policy intent	Evidence-based diagnosis	Implication and reform priority
Affordability/competitiveness under state control	Price interventions do not generate rapid physical adjustment; they mainly reallocate rents/risks and can weaken investment ability if incidence is opaque	Implication: affordability can undermine reliability and investment signals. Priority: impose guardrails (explicit incidence/compensation logic; eligibility; timebound design; routine review).
Secure domestic supply for priority users; manage tightness	Scarcity is addressed through administrative coordination rather than rule-based balancing	Implication: higher transaction costs, contract-risk premia, and inefficient curtailment/reallocation. Priority: move toward published, auditable curtailment/balancing protocols, piloted corridor-by-corridor.
Enable contestability and entry via TPA and openness provisions	“TPA on paper” but operationally weak	Implication: muted competition and persistent price dispersion. Priority: operational TPA code+transparency layer (capacity registry/bulletin board; published tariffs; standard products; fast dispute resolution).
Improve accountability and predictable governance	Overlapping mandates and ad hoc interventions weaken predictability and enforcement credibility	Implication: regulatory uncertainty and delayed investment. Priority: clarify decision rights+institutionalize ex ante/expost evaluation for major interventions; corridor-level governance protocol.

**Figure 7: Timeline of Indonesia's Natural Gas Pricing and Allocation Regulations (2001-2022)**

average of 0.2018 and a median of  $-0.0133$ , indicating that while a few years exhibit modest positive responsiveness, the typical annual production response is effectively zero. The corresponding log–log slope elasticity of 0.0012 confirms that production is almost perfectly inelastic with respect to JCC. For domestic demand, the annual midpoint average ( $-0.1353$ ) and median ( $-0.0267$ ), together with the log–log slope elasticity ( $-0.0630$ ), consistently indicate weak inverse responsiveness, suggesting that domestic gas use is inelastic and shaped not only by external prices but also by administered pricing, allocation, and sector-specific policy priorities. For exports, the annual midpoint estimates show a positive average of 0.2957 but a slightly negative median of  $-0.0323$ , pointing to strong year-to-year instability rather than a stable price relationship. The log–log slope elasticity of  $-0.6527$  further suggests that, at the aggregate level, export volumes tend to move inversely with JCC, reflecting the importance of domestic-priority steering, long-term contractual commitments, and deliverability constraints.

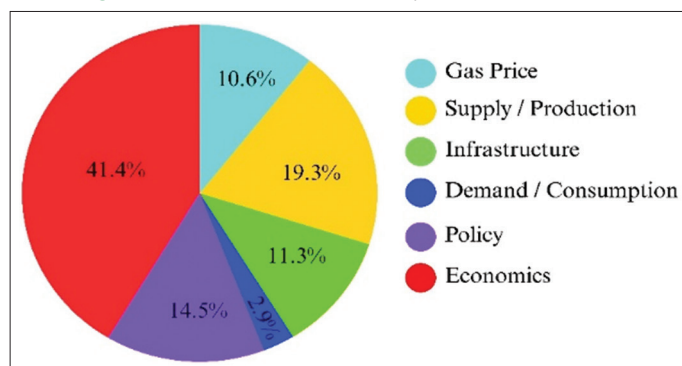
These findings suggest that Indonesia's gas market does not exhibit a stable, price-led adjustment mechanism. Production, domestic consumption, and exports all show low and uneven responsiveness to external price signals. The annual midpoint estimates are useful in revealing temporal heterogeneity, while the log–log slope confirms that the system remains weakly responsive in aggregate. This implies that market performance under stress depends less on automatic price adjustment than on governance

arrangements surrounding allocation, curtailment, access, and contractual coordination.

#### 4.2.3. Pricing and market governance

As established in the Policy and Regulation Analysis and summarized in Figure 7, Indonesia's pricing–allocation regime has evolved from an early market-oriented intent toward administrative steering through layered price interventions and prioritized allocation. Unlike competitive gas systems where wholesale prices emerge from transparent trading and balancing, Indonesia's gas prices are largely set administratively through a layered price stack (upstream and LNG-linked components, regulated transport/distribution charges, and trading margins), with affordability objectives implemented via corridors/caps for selected users. The analytical issue is therefore not regulation per se, but how the price stack allocates cost incidence and risk across the value chain in a setting where access neutrality and real-time transparency—discussed in the Competition Policy and Market Openness Policy subsections—remain incomplete.

Market-conduct mechanisms follow. First, affordability pricing implemented through netback-like logic effectively makes midstream remuneration and commercial margins a residual in the delivered price equation, weakening incentives for efficiency upgrades and expansion in high investment risk areas. Second, because both short-run supply and domestic demand are highly inelastic (as shown by the Indonesia-

**Figure 8:** Mass media content analysis, 2020 to Q2 2025

specific elasticities in the previous subsection), price interventions primarily redistribute rents and risks rather than produce rapid quantity adjustment: who absorbs the gap (state compensation, upstream fiscal take, SOE balance sheets, or end-users outside the scheme) becomes more consequential than any short-run “demand response.” Third, the coexistence of capped and uncapped segments, combined with limited balancing infrastructure, produces delivered-price dispersion and episodic “shadow pricing” when marginal molecules are sourced from LNG or when corridor constraints bind—so the effective scarcity signal reappears through availability constraints and contract renegotiation rather than through an observable market-clearing price.

These outcomes are amplified by governance features that are distinct from the regulatory structure issues discussed earlier. In this environment, price-and-allocation interventions require guardrails: routine ex-ante/ex-post evaluation of major interventions, transparent incidence/compensation logic, and enforceable access neutrality are necessary conditions for affordability objectives to avoid undermining inevitability and supply reliability—especially as deliverability tightness has re-emerged in recent years (as discussed in the industry dynamics section).

### 4.3. Stakeholder and Public Perception

This section uses stakeholder and public perception evidence to triangulate the market-structure diagnosis of interaction relations and the elasticity-based interpretation of short-run rigidity. The aim is not to add opinions, but to test whether the constraints identified in those analyses are also salient in lived experience and public dialogue, and whether they create reinforcing feedback that stabilizes the current governance equilibrium. Evidence comes from a mass-media content analysis of 889 articles (2020-Q2 2025) and semi-structured interviews/FGDs with regulators, upstream and midstream actors, industrial buyers, and sector associations—an approach consistent with OECD/APEC principles that treat consultation and narrative evidence as inputs to regulatory review and reform legitimacy (OECD, 1997).

Figure 8 shows discourse converging on two dominant concerns—economic viability (41.4%) and supply certainty/production stability (19.3%)—which support the binding constraints identified in market structure and elasticity. Importantly, both themes are framed not only as operational problems (prices, volumes), but

as market-design failures (access, transparency, discretion), strengthening the earlier “form-without-function” diagnosis.

The viability narrative reflects perceived opaque cost incidence and unstable commercial conditions across the chain. It corresponds to the structural findings of functional concentration and vertical integration: despite 69 PSC holders, production is dominated by a few producers, while midstream access is determined by incumbent control and weak contestability. In this setting, “viability” is less about nominal end-user prices than about who absorbs the burden of price caps, tariffs, and volume risk under administratively determined outcomes. The elasticity lens strengthens the mechanism: with short-run inelastic industrial demand (fertilizer, petrochemicals, steel), administered price reductions are unlikely to generate immediate efficiency gains; instead, they mainly redistribute rents and affect cash flow, while larger effects emerge through longer-run investment and switching decisions. This helps explain why viability concerns prevail even under nominal price support, especially when compensation and access conditions are opaque, and midstream investment incentives weaken. International experience is consistent: OECD guidance stresses that price/subsidy interventions require ex-ante appraisal, distributional incidence analysis, and routine ex-post review to reduce distortions and rent capture; reforms also rely on structured consultation to maintain legitimacy and calibrate compensation logic (OECD, 2002a; 2009).

Supply certainty is framed as an institutional coordination problem rather than simple scarcity. Stakeholders link stability to infrastructure rigidity, discretionary allocation, and weak market coordination—consistent with the elasticity finding that short-run supply is highly inelastic as well as resilience, therefore depends on connectivity, transparent access, balancing rules, and reliable information systems. A salient episode is PGN Circular Letter No. 416100.S/PP.03/RD1TGR/2023, which capped industrial offtake, indicating how supply risk is experienced through contract uncertainty and perceived discretion rather than aggregate shortage statistics. Where rerouting flexibility is limited and real-time capacity information is absent, administrative curtailment becomes the default balancing tool, and risk premia rise. IEA and EU/UK governance experience similarly indicates that security-of-supply improves when constraints are made observable and rule-governed through transparency, balancing rules, and access regimes; when managed through opaque discretion, trust deteriorates, and reform legitimacy weakens (Hafner and Tagliapietra, 2017; Stren and Rogers, 2017; Swennen and Leuven, 2017).

## 5. POLICY IMPLICATIONS

Table 7 clarifies that the main policy problem is not the presence of state intervention but the functional gap between (i) the objectives pursued through administered pricing and allocation and (ii) the operational market-design infrastructure required to make those instruments predictable, auditable, and less distortionary. As synthesized in the pricing-allocation trajectory (Figure 7), governance has increasingly relied on administrative coordination, while the enabling layer for contestability and reliable adjustment—enforceable access neutrality, transparent

capacity/tariff disclosure, and rule-based balancing—remains incomplete in operation. In such settings, efficiency and resilience improvements are most likely to come from functional governance upgrades—guardrails for price-and-allocation interventions, operationalized and enforceable access neutrality, a minimum transparency layer, and credible balancing/curtailment protocols—rather than from “model copying” of liberalization templates.

## 6. CONCLUSION

This study explains Indonesia's recurring domestic gas tightness as a governance and market-design failure, rather than a simple consequence of resource depletion. Triangulating regulatory review, market-structure diagnostics, and stakeholder/public narratives, the findings consistently point to a closed and inflexible market architecture in which vertically integrated SOE dominance, overlapping institutional mandates, discretionary allocation, and weakly operationalized TPA constrain contestability and restrict efficient producer–buyer matching.

A central result is that affordability-oriented interventions have expanded faster than the governance functions required to make them credible and minimally distortionary in operation. Pricing and allocation measures are frequently introduced without disciplined ex-ante/ex-post evaluation, while limited transparency—especially the absence of real-time capacity and access information—reinforces reliance on discretionary balancing and increases contract-risk perceptions. In combination, these features weaken investment signals throughout the value chain and sustain deliverability constraints, helping to explain why tightness can re-emerge even in a resource-rich system.

Narrative evidence reinforces the structural diagnosis. Stakeholder and media concerns converge on economic viability and supply certainty, consistent with a feedback loop in which ad hoc interventions and opaque incidence/compensation weaken confidence, discourage timely investment and flexibility provision, and thereby increase pressure for further discretionary intervention. This loop clarifies why partial reforms can persist: legal or institutional changes on paper do not translate into contestable outcomes without operational rules and credible enforcement.

Policy implications, therefore, prioritize governance modernization rather than template liberalization. Key priorities are to (i) clarify mandates and decision rights across pricing, allocation, access, and transparency; (ii) institutionalize routine policy-cycle discipline for major interventions (ex-ante appraisal and ex-post review); (iii) operationalize non-discriminatory midstream access through enforceable TPA arrangements and fast dispute resolution; (iv) separate affordability objectives from opaque price suppression by adopting targeted, auditable instruments with clear incidence/compensation logic; (v) mandate a minimum transparency layer (capacity, tariffs, congestion) to enable rule-based balancing; and (vi) adopt corridor-based sequencing that reflects Indonesia's spatial imbalance. Future work should apply RIA/CBA to quantify fiscal and welfare incidence across reform sequences and to test corridor-level pilots against measurable

outcomes (reliability, access neutrality, delivered-price dispersion, and investment mobilization).

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