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Transformation of the 3 kg Liquefied Petroleum Gas (LPG) Subsidy Policy in Indonesia

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Abstract

The transformation of Indonesia's 3-kg LPG subsidy policy marks a progressive shift from an open, commodity price-based distribution system toward a beneficiary-targeted scheme reinforced by digital infrastructure. This study examines the evolution of policy objectives and governance arrangements across the LPG supply chain, spanning the 2007 kerosene-to-LPG conversion program through the post-2024 adoption of National Identification Number (NIK)-based targeting and digital transaction recording. Departing from earlier research that primarily addresses fiscal costs or subsidy effectiveness, the analysis advances a structured periodization framework integrated with a supply-chain governance perspective to illuminate how regulatory reforms, targeting instruments, and digital systems jointly reshape delivery mechanisms. Employing a descriptive qualitative design grounded in historical-archival methods, the study draws on government regulations, official reports, statistical records, and scholarly literature. Three analytically distinct phases emerge. The first phase (2007–2018) established an open distribution model that successfully curtailed kerosene use and generated fiscal savings, yet suffered substantial leakage and targeting inaccuracies. The second phase (2019–2023) constituted a transitional period characterized by strengthened regulatory frameworks and nascent digital monitoring. The third phase (2024–present) institutionalizes identity-based distribution through NIK verification and digital applications that document transactions throughout the supply chain, thereby enhancing accountability and precision. By combining policy periodization with a supply-chain governance lens, the study provides an analytical framework for understanding the institutional evolution of subsidy delivery. Persistent challenges remain, including inclusion errors, ambiguous beneficiary criteria, unclear consumption quotas, and ongoing vulnerability of the distribution chain to price distortions.

KEYWORDS

energy subsidy; reform policy transformation; 3 kg lpg subsidy policy.

Introduction

Energy subsidies are widely used to stabilize household energy access and protect vulnerable groups from price volatility, and in Indonesia this policy is reflected in the 3-kg LPG subsidy introduced through the kerosene-to-LPG conversion program in 2007. However, the open distribution mechanism has generated persistent governance problems, including subsidy leakage, inaccurate targeting, and distortions in the distribution chain, while most previous studies focus only on earlier policy phases. Since 2024 the government has introduced identity-based distribution using National Identification Numbers (NIK) and digital applications, and this study analyzes the evolution of the policy and its governance across different periods to understand how these reforms reshape the LPG subsidy distribution system. In the global context, subsidy budgets for fossil fuel consumption, including gas for cooking purposes, amount to hundreds of billions of dollars annually. This reflects governments' fiscal commitment to ensuring the availability of affordable energy for society (Sovacool, 2017).

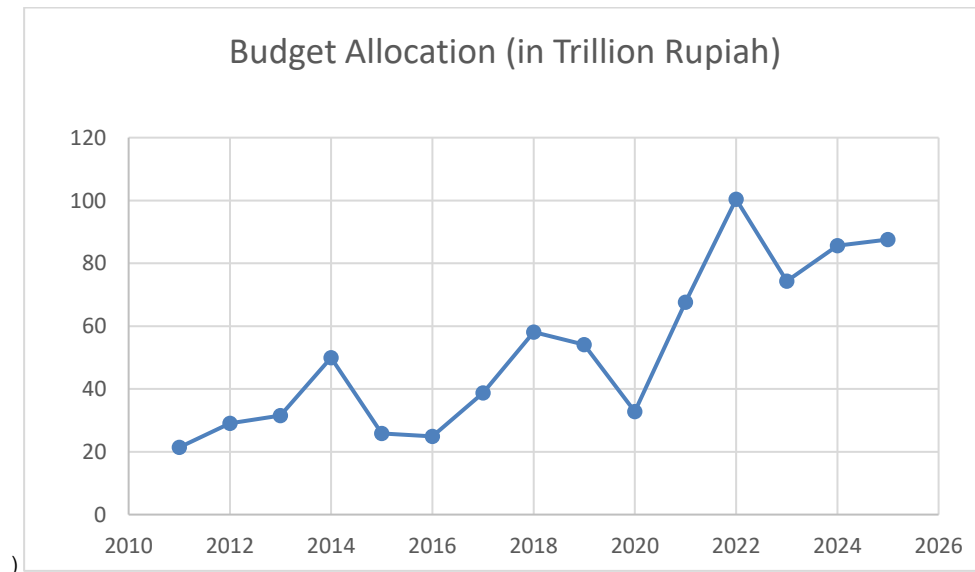


Figure 1. Budget Allocation for the 3 kg LPG Subsidy (2011–2025)

Source: katadata.co.id & berkas.dpr.go.id (processed by the author)

In efforts to achieve sustainable development and expand access to clean energy, numerous international studies indicate that LPG subsidies for cooking play a crucial role in facilitating households' transition from dirty and polluting biomass fuels to cleaner and more efficient energy sources. This transition not only makes cooking activities more practical but also generates measurable public health benefits by reducing exposure to indoor air pollution, which is associated with respiratory and cardiovascular diseases among households relying on traditional fuels (Gould et al., 2024; Vadiyah & Rosid, 2023). Empirical studies estimate that the shift from biomass or kerosene to cleaner fuels such as LPG can substantially lower household air pollution levels and reduce health risks, particularly for women and children who experience the highest exposure during cooking activities. Experiences from several developing countries further demonstrate that LPG subsidies operate not only as instruments of social protection to maintain affordable household energy access but also as mechanisms for stabilizing domestic energy consumption and mitigating the broader economic impacts of energy price volatility.

For example, India has consistently implemented LPG subsidy policies to improve household energy access through two distribution schemes: the Pradhan Mantri Ujjwala Yojana (PMUY) and the Direct Benefit Transfer for LPG (DBTL). The PMUY scheme provides subsidies in the form of free initial access to LPG for poor and vulnerable households, particularly in rural areas, including the provision of new LPG connections, LPG cylinders, stoves, and the first refill (Afridi & Bhattacharya, 2024). Meanwhile, the DBTL program is implemented through a direct cash transfer mechanism to the verified bank accounts of eligible beneficiaries, with eligibility criteria requiring that applicants be legitimate LPG consumers whose income does not exceed ₹1,000,000 (Pratyaksh Hanstantrit Labh / Direct Benefits Transfer For LPG, 2024).

Another example is Peru, which implements an LPG subsidy policy through the Fondo de Inclusión Social Energético (FISE) program. Under this program, the Peruvian government provides subsidies to poor households identified based on low electricity consumption and linked to socioeconomic data, in the form of vouchers or price discounts that can be used to purchase 10 kg LPG cylinders (Toft & Beaton, 2016). Similarly, Indonesia's relatively high dependence on kerosene prompted the government to introduce a liquefied petroleum gas (LPG) subsidy policy

commonly known as the 3 kg LPG program since 2007 as part of the national energy conversion initiative. This policy was designed to replace subsidized kerosene with subsidized LPG, which is considered cleaner, more efficient, and more practical, while also targeting poor households and micro-enterprises as the primary beneficiaries (Mineral, 2025).

Across many countries, energy subsidy reform has become a critical issue amid increasing budgetary pressures, volatility in international energy prices, and growing demands for a transition toward more sustainable energy systems. These challenges have placed many countries, including Indonesia, in a dilemma between maintaining energy affordability for the public and ensuring subsidy efficiency and accurate targeting. This situation has driven a paradigm shift in subsidy policy from a commodity-based approach toward a beneficiary-based approach, emphasizing targeting accuracy and distributional accountability.

In Indonesia, the fiscal pressure associated with the 3-kg LPG subsidy can be observed from the long-term trend in government budget allocations. Over the past decade, subsidy expenditures have shown a clear upward trajectory, with several periods of sharp increases reflecting rising LPG consumption and widening gaps between subsidized and market prices. These fluctuations indicate that the subsidy burden is highly sensitive to both energy price dynamics and weaknesses in the distribution and targeting system, particularly the persistence of open access that allows non-eligible users to benefit from the subsidy. Consequently, the increasing budget allocation not only reflects growing demand for subsidized LPG but also signals structural limitations in policy design, where insufficient targeting mechanisms and weak oversight of the distribution chain contribute to escalating fiscal pressure on the state budget.

The Figure 1 shows that the budget allocated for the 3 kg LPG subsidy has fluctuated significantly with an overall upward trend (Hamka et al., 2022; Kusnandar, 2025). Budget spikes in certain years indicate increasing fiscal pressure borne by the state, while declines in subsequent years do not necessarily reflect structural improvements in subsidy management. This pattern suggests that the size of the 3 kg LPG subsidy budget is influenced not only by external factors but also by weaknesses in policy design and distribution mechanisms that have not fully ensured accurate targeting. With a long-standing open distribution scheme, rising budgets may exacerbate subsidy leakage and extend benefits to non-target groups,

underscoring that the challenges of the 3 kg LPG subsidy lie not merely in budgetary aspects but also in governance effectiveness, oversight systems, and institutional capacity in managing subsidized energy distribution.

Over time, socio-economic dynamics, changes in national fiscal capacity, and increasing demands for public transparency and accountability have compelled the government to adjust and reform LPG subsidy policies. This policy transformation has not occurred linearly but rather through multiple phases of change that reflect the state's responses to implementation challenges, budgetary pressures, and the need to improve subsidy targeting accuracy. Therefore, the 3 kg LPG subsidy policy can be understood as dynamic and adaptive to evolving contexts.

Based on these conditions, this paper is structured to systematically and periodically analyze the transformation of the 3 kg LPG subsidy policy and its supply-chain governance in Indonesia. By dividing the policy into several temporal phases, this study seeks to reveal changes in policy objectives, shifts in policy instruments, and the implications of these changes for energy subsidy governance. The analysis is expected to contribute academically to public policy studies and serve as a reflective reference for formulating more effective, equitable, and sustainable energy subsidy policies in the future and food insecurity that dominate contemporary conflict settings. As highlighted in the UNDP Human Development Report (1994) and subsequent human security scholarship, these people-centered vulnerabilities persist irrespective of state survival, rendering the human security approach a more analytically adequate framework for capturing multidimensional insecurity beyond conventional paradigms.

Methods

This study employs a descriptive qualitative approach with a historical-archival policy analysis design to examine the transformation of the 3-kg LPG subsidy policy and its supply-chain governance in Indonesia. In this research, "archival" sources refer to formally documented policy materials stored in institutional repositories and official government databases, including national legislation archives, ministerial regulations, parliamentary records, policy reports, and statistical publications issued by key institutions such as the Ministry of Energy and Mineral Resources, the Ministry of Finance, the national statistical agency, and state energy authorities. The document corpus covers the period from 2007 when the kerosene-to-LPG conversion program was introduced to the post-2024 phase characterized by digitalized distribution and identity-based targeting. The qualitative approach is selected because the study aims to develop an in-depth understanding of policy dynamics, institutional contexts, and regulatory rationales that cannot be adequately captured through quantitative measurement alone. Descriptive qualitative analysis is particularly suitable for examining public policy processes that evolve across regulatory periods and institutional arrangements (Creswell, 2012).

The data used in this study consist of secondary documents obtained through systematic documentation and literature review. The document selection protocol includes national laws and regulations related to energy subsidies, official government reports on subsidy expenditure and energy distribution, statistical datasets on LPG consumption, and peer-reviewed academic studies addressing subsidy policy and energy governance. Sources were identified through searches in official government portals, national regulation databases, and academic publication platforms using keywords such as "LPG subsidy," "3-kg LPG policy,"

"energy subsidy reform," and "digital subsidy distribution." Documents were included when they directly addressed policy instruments, regulatory changes, subsidy implementation, or distribution governance of the 3-kg LPG program, while sources lacking clear policy relevance were excluded. To enhance analytical reliability, information from different document types was triangulated by comparing regulatory texts, official reports, and academic analyses, and discrepancies among sources were resolved through cross-verification with primary regulatory documents.

Data analysis was conducted qualitatively through three stages: data reduction, thematic categorization, and policy interpretation. First, relevant policy documents were systematically reviewed and reduced to key information related to policy objectives, regulatory instruments, targeting mechanisms, and distribution governance. Second, the data were categorized thematically to identify patterns of institutional change across different policy periods. Third, policy interpretation was conducted by comparing these thematic patterns across phases to explain the trajectory of subsidy governance transformation. To ensure analytical rigor, the study maintains an audit trail of document sources and coding decisions and applies source verification to minimize potential bias in secondary materials, particularly where policy reports or media summaries present incomplete or inconsistent information.

Result and Discussion

The 3 kg LPG Subsidy Policy (2007–2022): Open Distribution Scheme

The 3-kg Liquefied Petroleum Gas (LPG) subsidy policy was introduced in 2007 through the national kerosene-to-LPG conversion program with two primary objectives: reducing the fiscal burden of kerosene subsidies and expanding access to cleaner household energy for low-income households and micro-enterprises. Empirical evaluations indicate that the policy successfully accelerated the transition from kerosene to LPG and improved the accessibility of modern cooking fuels (Gintings & Suryanti, 2024a). However, the policy design relies on an open distribution scheme that allows universal access to subsidized LPG without systematic beneficiary verification. Several studies report that this distribution model has weakened policy effectiveness and created governance challenges within the subsidy system (Muharam et al., 2025). In this study, policy effectiveness refers to the extent to which the subsidy reaches its intended target groups and achieves its objectives of improving energy access while controlling fiscal expenditure. Meanwhile, distributional equity is operationalized through indicators such as the incidence of benefits among eligible households, the level of subsidy leakage to non-target consumers, and the presence of inclusion or exclusion errors within the distribution process. Evidence from previous analyses shows that the absence of strict targeting mechanisms has contributed to substantial leakage of subsidized LPG to middle- and higher-income users, thereby reducing the proportional share of benefits received by the intended low-income groups and weakening the equity of subsidy allocation.

Empirical studies indicate that although this conversion program successfully shifted household energy consumption away from kerosene and reduced government expenditures on energy subsidies, a substantial share of the subsidy has been captured by middle- and upper-income groups rather than the intended beneficiaries, thereby exacerbating distributional inequities and fiscal pressures (Gobel, 2024; F. Rochman, 2022). Moreover, weak monitoring mechanisms, uneven distribution networks, and insufficient control infrastructure have led to recurrent problems such as supply shortages, long

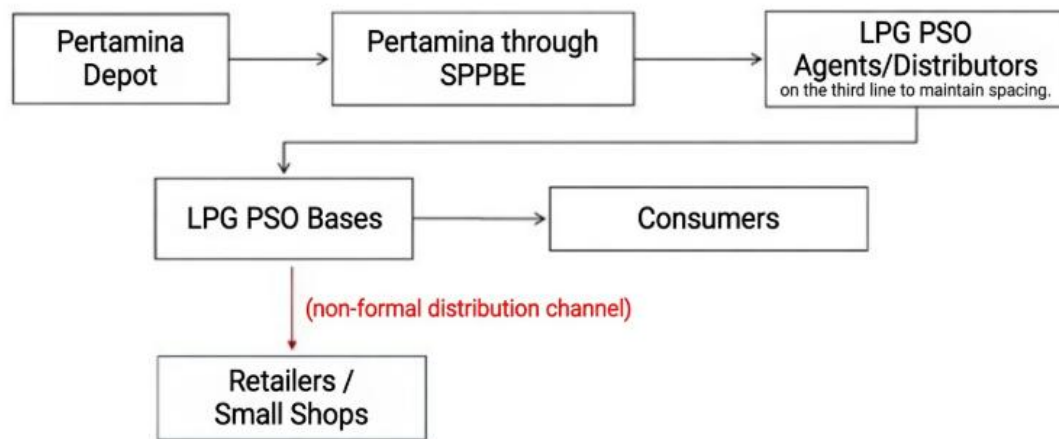


Figure 2. The 3 kg LPG Distribution Chain

Source: TNP2K, 2021 (processed by the author)

queues, and retail prices exceeding the official *Maximum Retail Price (Harga Eceran Tertinggi – HET)* in several regions, all of which undermine the achievement of policy objectives (Mariani & al., 2025; Siahaan & al., 2025). Consequently, both international and national literature strongly recommend policy reform through the digitalization of beneficiary data, data-driven verification systems, and a clearly defined beneficiary-based distribution framework to ensure that the 3 kg LPG subsidy is accurately targeted, socially equitable, and fiscally as well as operationally sustainable (Gobel, 2024; Juanda & al., 2025; Kusnandar, 2025).

The implementation of the kerosene-to-3 kg LPG conversion program was supported by a comprehensive regulatory framework aimed at providing legal certainty and operational guidance. The primary legal foundation began with Law No. 22 of 2001 on Oil and Gas, which regulates upstream and downstream oil and gas activities, including processing, transportation, storage, and trading. This was followed by Presidential Regulation No. 5 of 2006 on the National Energy Policy, which established energy diversification as a strategic direction to reduce dependence on petroleum fuels and promote alternative energy sources, including LPG. The most critical operational regulation was Presidential Regulation No. 104 of 2007 on the Provision, Distribution, and Pricing of 3 kg LPG Cylinders, issued on 28 November 2007. This regulation specifically governs the mechanisms for supplying, distributing, and pricing subsidized 3 kg LPG and stipulates that the subsidy is exclusively intended for households and micro-enterprises. To further strengthen the regulatory framework, the government issued the MEMR Ministerial Letter No. 1971/26/MEM.M/2007 dated 22 May 2007 concerning the assignment for implementing the kerosene-to-LPG conversion program, the MEMR Ministerial Letter No. 3924/26/MEM.M/2007 dated 27 December 2007 assigning PT Pertamina to distribute 3 kg LPG, and MEMR Regulation No. 26 of 2009 on the Provision and Distribution of LPG, which regulates technical aspects of LPG distribution and supervision in the field.

During this period, the distribution scheme for 3 kg LPG followed an open distribution system, which was general in nature and provided subsidies in the form of the LPG product itself rather than being based on identified beneficiaries. Consequently, anyone could purchase subsidized 3 kg LPG without specific mechanisms for verification or eligibility identification. The distribution chain for 3 kg LPG during this period was as follows:

Based on Figure 2, the distribution chain begins with the supply of LPG by Pertamina Patra Niaga through Stasiun

Pengisian dan Pengangkutan Bulk Elpiji (SPPBE), which obtain LPG from Pertamina depots or refineries (storage terminals). The LPG is then distributed to officially appointed LPG agents across various regions, who subsequently distribute it to registered LPG bases (pangkalan) as formal distribution points for end consumers. In the non-formal channel, LPG bases typically distribute 3 kg LPG to retailers or small shops (*pengecer/warung*) (Hamka et al., 2022). Under this open distribution scheme, there were no purchase quotas and no beneficiary registration mechanisms, allowing consumers to purchase as many 3 kg LPG cylinders as desired as long as stock was available.

In the context of subsidized *Liquefied Petroleum Gas (LPG)* distribution in Indonesia, the supply chain process begins with the provision of LPG by PT Pertamina Patra Niaga through Stasiun Pengisian dan Pengangkutan Bulk Elpiji (SPPBE), which receive supplies from Pertamina depots or refineries, after which the product is distributed to officially appointed agents across various regions. These agents subsequently channel LPG to registered LPG bases (*pangkalan*) that function as formal distribution points for end consumers, reflecting the formal distribution channel structure established by national distribution policies within the management of subsidized energy supply chains (Nikira et al., 2025). Furthermore, empirical studies on the distribution of 3 kg LPG cylinders indicate that legally recognized supply channels follow the SPPBE-agent-base-consumer sequence, although variations in outbound flows occur through retailers who deliver LPG to consumers via secondary channels. Informal distribution practices, such as sales to small retailers, are common within an *open distribution scheme*, which is empirically associated with market behavior allowing consumers to purchase 3 kg LPG cylinders without quota restrictions, thereby increasing demand volatility and the risk of supply shortages (Anang, n.d.). This condition creates dynamic interactions between formal and informal distribution structures in practice, leading the literature on LPG supply management to emphasize the need for stricter control mechanisms through beneficiary registration and regulatory enforcement to improve distribution efficiency and prevent hoarding and unauthorized distribution (Gintings & Suryanti, 2024b).

Referring to Presidential Regulation No. 104 of 2007 on the Provision, Distribution, and Pricing of 3 kg LPG Cylinders, the initial LPG package recipients were designated as households and micro-enterprises based on specific criteria. Households were defined as consumers with legal residency status who previously used kerosene as a cooking fuel for household activities and had not owned or used gas stoves, thus qualifying for conversion to 3 kg LPG. Micro-enterprises were defined as

individually owned productive businesses with legal residency status that used kerosene for cooking activities within their business operations and had not yet used gas stoves, making them eligible for conversion to 3 kg LPG. Both households and micro-enterprises targeted by the program were required not to have received similar assistance previously. During this period, the distribution of the 3 kg LPG subsidy was implemented gradually through the provision of initial LPG packages to target communities. These packages consisted of a 3 kg LPG cylinder, a gas stove, and other supporting equipment. Between 2007 and 2018, a total of 57,715,288 starter packages were distributed to the public (Bangun, 2020). Moreover, the program successfully shifted household energy consumption significantly from kerosene to LPG. Kerosene consumption declined from approximately 9.85 million kiloliters in 2007 to about 850 thousand kiloliters within several years after implementation. From a fiscal perspective, the program generated estimated savings of approximately IDR 197 trillion during the period 2007–2016 (Mineral, 2016).

Despite these achievements, the implementation of the open distribution scheme also generated several consequences and emerging challenges that later underscored the need for further reform. On the one hand, the absence of beneficiary registration and verification mechanisms allowed subsidized 3 kg LPG to be accessed by nearly all segments of society regardless of income level. As a result, subsidies initially intended for low-income households and micro-enterprises were, in practice, widely consumed by middle- and upper-income households. This situation reduced subsidy effectiveness in terms of distributional equity and contributed to the expansion of LPG subsidy expenditures in the state budget, particularly as 3 kg LPG consumption continued to increase amid fluctuations in international LPG prices and the rupiah exchange rate. On the other hand, the rapid growth in the number of 3 kg LPG users was not always matched by adequate distribution infrastructure and supervisory capacity, leading in certain periods to localized supply shortages, long queues, and retail prices exceeding the official maximum retail price (*Harga Eceran Tertinggi*) in several regions.

These challenges fostered growing recognition that, although the conversion program was highly successful in terms of distribution scale and subsidy savings, the open distribution scheme required transformation into a more controlled, data-driven, and beneficiary-based system. Such a transformation is necessary to ensure that the 3 kg LPG subsidy is accurately targeted, socially equitable, and fiscally sustainable.

The 3 kg LPG Subsidy Policy (2019–2023): A Phase of Conceptual Transition Toward a Closed Distribution System

The period 2019–2023 marks a conceptual transition in Indonesia's 3 kg *Liquefied Petroleum Gas* (LPG) subsidy policy, characterized by a gradual shift from a commodity-based subsidy toward a *people-based subsidy* model aimed at improving targeting accuracy and fiscal sustainability (Gobel, 2024; Muharam & al., 2025). This transition was driven by persistent *inclusion errors* under the *open distribution scheme*, where empirical studies show that middle- and upper-income households captured a disproportionate share of LPG subsidies while the poorest groups received only about one-quarter of total benefits, thereby intensifying fiscal pressure amid rising subsidy expenditures (M. F. Rochman et al., 2022; Siahaan & al., 2025). In response, the government initiated regulatory restructuring and digital experimentation through beneficiary databases, barcode- and application-based transaction systems, and strengthened inter-agency coordination, reflecting global best practices in energy subsidy reform that

emphasize data integration, digital monitoring, and phased implementation to reduce social and political risks (Bril-Mascarenhas & Post, 2021). Consequently, the introduction of mandatory user registration and electronic transaction recording in 2023 represents a critical preparatory stage toward a *closed distribution system*, aligning Indonesia's LPG subsidy reform with international evidence that targeted, digitally enabled energy subsidies are more equitable, transparent, and fiscally resilient than untargeted price-based schemes (Kojima, 2021; Rentschler & Bazilian, 2022).

In response, the government began formulating various policy transformation options aimed at shifting subsidies from products to beneficiaries through more accurately targeted delivery mechanisms supported by integrated data systems and digital technologies. In early 2020, the Ministry of Energy and Mineral Resources (MEMR) announced plans to implement a more targeted 3 kg LPG distribution system based on a beneficiary database compiled by the National Team for the Acceleration of Poverty Reduction (*Tim Nasional Percepatan Penanggulangan Kemiskinan TNP2K*), covering approximately 15–25 million households. One proposed alternative involved the use of a barcode-based identification system integrated with the banking sector to monitor household LPG consumption patterns among subsidy recipients. However, full implementation of this policy was constrained by regulatory and infrastructure readiness, leading the government during the 2020–2021 period to focus primarily on refining policy design, piloting digital distribution systems, and strengthening inter-agency coordination.

During this period, regulatory restructuring also took place through the issuance of Presidential Regulation No. 70 of 2021, which amended Presidential Regulation No. 104 of 2007 on the Provision, Distribution, and Pricing of 3 kg LPG Cylinders. This regulation reaffirmed the status of 3 kg LPG as *Designated LPG (LPG Tertentu)* intended for households and micro-enterprises, while also reorganizing the assignment of supply and distribution responsibilities to designated business entities (including subsidiaries) to ensure availability and legal certainty. Subsequently, Presidential Regulation No. 71 of 2021 amended Presidential Regulation No. 38 of 2019 by explicitly including *targeted fishermen* and *targeted farmers* as eligible recipients of 3 kg LPG for fishing vessels and water pumps. This regulation also granted the Minister of Energy and Mineral Resources the authority to determine annual volume requirements through the establishment of annual quotas of *Designated LPG* for these groups. With the issuance of these two presidential regulations, the normative target groups for the 3 kg LPG subsidy expanded to four main categories: households, micro-enterprises, targeted fishermen, and targeted farmers.

Policy changes at the presidential level were subsequently followed by adjustments to technical regulations under the Ministry of Energy and Mineral Resources, particularly through the issuance of MEMR Regulation No. 28 of 2021, which updated the provisions of MEMR Regulation No. 26 of 2009 on LPG supply and distribution. This regulation reaffirmed the status of 3 kg LPG cylinders as *Designated LPG* with limited beneficiaries and strengthened the obligations of assigned business entities, distributors, and sub-distributors to ensure adequate supply in accordance with designated distribution areas. Furthermore, in 2023, the direction toward a beneficiary-based subsidy began to be operationalized through the issuance of MEMR Decree No. 37.K/MG.01/MEM.M/2023 and the Decree of the Director General of Oil and Gas No. 99.K/MG.05/DJM/2023. These regulations govern the phased registration and digitalization of 3 kg LPG distribution, mandating electronic transaction recording systems, defining requirements for sub-distributors, and establishing phased implementation across regions and timeframes to align with local readiness.

The registration procedure for 3 kg LPG users, implemented between 1 March and 31 December 2023, required consumers to visit LPG bases or sub-distributors and present their identification documents (National Identification Number or Family Card) for registration. Subsequent purchases of 3 kg LPG were processed by verifying registered identification, and consumers who had not yet been registered were required to complete registration prior to purchase (Himawan, 2023; Afridi & Bhattacharya, 2024; Suliyono & Syafiuddin, 2025).

This data registration policy was positioned as a precondition for the eventual implementation of a closed distribution system, which was initially planned to take effect on 1 January. However, throughout 2023, no purchase quantity restrictions were imposed; instead, the primary change involved a shift from manual logbook recording to a digital transaction system based on the Merchant Applications Platform (MAP). This approach reflects a gradual transition strategy encompassing the development of a valid beneficiary database, testing and stabilization of digital infrastructure, and preparation of a new regulatory framework that will govern eligibility criteria and the more controlled distribution mechanism of the 3 kg LPG subsidy.

The 3 kg LPG Subsidy Policy (2024–Present): Closed Distribution Scheme

Since 2024, Indonesia's 3 kg *Liquefied Petroleum Gas* (LPG) subsidy policy has officially entered a phase of a *closed distribution scheme*, marked by a fundamental shift from a commodity-based subsidy toward a *beneficiary-based subsidy* supported by an integrated regulatory framework and a national digital system (Gobel, 2024; Muharam et al., 2025). The implementation of registration based on the National Identification Number (NIK) and digital transaction recording through the *Merchant Apps Pangkalan* (MAP) enables the state to monitor purchaser identity, transaction frequency, and purchase location at an individual level, thereby enhancing transparency, accountability, and targeting accuracy compared to the previous open distribution scheme (Gintings & Suryanti, 2024a; Siahaan & al., 2025). International literature demonstrates that digitalized and *closed targeting* approaches in energy subsidies significantly reduce *inclusion errors*, strengthen distributional equity, and improve fiscal efficiency, particularly in developing countries facing budgetary constraints and global energy price volatility.

Consequently, since 2024 the 3-kg LPG subsidy policy has gradually shifted from a universally low-price commodity subsidy toward a targeted social assistance instrument supported by digitalized administrative systems. Under this framework, subsidy distribution is increasingly linked to identity-based verification and transaction monitoring, allowing beneficiaries to be more systematically identified and policy impacts to be measured with greater precision (Mariani & al., 2025). From a governance perspective, this transformation reflects a broader transition from price-based subsidy regimes toward targeted welfare mechanisms that rely on administrative capacity, integrated databases, and digital monitoring infrastructures. In theoretical terms, the reform aligns with contemporary approaches to welfare targeting and digital social protection, where subsidy allocation is mediated through identity verification systems and data-driven oversight to improve benefit incidence, reduce leakage, and strengthen fiscal sustainability. As a result, the governance of energy subsidies becomes increasingly embedded within digital administrative frameworks that enable governments to monitor consumption behavior, refine eligibility criteria, and manage public expenditure more systematically.

The subsidy policy implemented in 2024 marks a phase in which the distribution scheme for 3 kg LPG was formally shifted from an open distribution system to a closed

distribution system, based on an established legal framework, namely:

1. Presidential Regulation No. 104 of 2007 as amended by Presidential Regulation No. 70 of 2021 on the Provision, Distribution, and Pricing of 3 kg LPG Cylinders, which reaffirms 3 kg LPG as *Designated LPG* for households and micro-enterprises and regulates the assignment of supply and distribution to designated business entities (Pertamina and its subsidiaries) within specific distribution areas.
2. Presidential Regulation No. 38 of 2019 as amended by Presidential Regulation No. 71 of 2021 on the Provision, Distribution, and Pricing of LPG for fishing vessels of targeted fishermen and water pump engines of targeted farmers. Through Article 8A, this regulation authorizes the Minister of Energy and Mineral Resources to determine the annual volume requirements of 3 kg LPG for fishermen and farmers, thereby formally incorporating these two groups into the target beneficiaries of the 3 kg LPG subsidy.
3. MEMR Regulation No. 28 of 2021 (amending MEMR Regulation No. 26 of 2009) on the Provision and Distribution of LPG, which synchronizes technical provisions with the two presidential regulations above, clarifies the definition of *Designated LPG*, stipulates that 3 kg LPG is intended for households, micro-enterprises, targeted fishermen, and targeted farmers, and regulates the limits of assignment (a maximum of two designated business entities per distribution area) to ensure supply availability and controllability.
4. MEMR Decree No. 37.K/MG.01/MEM.M/2023 and Director General of Oil and Gas Decree No. 99.K/MG.05/DJM/2023, which serve as the technical basis for the targeted distribution of refilled *Designated LPG*. These regulations govern distribution procedures, mandatory consumer data registration, the use of electronic devices and the Merchant Apps Pangkalan (MAP) application at sub-distributors and LPG bases, as well as the phased regional implementation of the program.
5. Minister of Finance Regulation No. 166 of 2023 on Procedures for the Provision, Calculation, Payment, and Accountability of Subsidy Funds for Certain Types of Fuel Oil, Special Assignment Fuel Oil, and 3 kg LPG Cylinders, which links subsidy payments to designated business entities with the volume of *Designated LPG* distributed in accordance with Presidential Regulations No. 70 of 2021 and No. 71 of 2021.

Based on this legal framework, the distribution scheme for 3 kg LPG in Indonesia in 2024 has been fully grounded in beneficiary identification and digital transaction recording across the distribution chain that had been gradually established in earlier phases. Structurally, the distribution channels continue to operate through designated business entities (Pertamina and appointed entities), agents/distributors, LPG bases (*pangkalan*), and officially registered sub-distributors or retailers. However, distribution outside the formal network has increasingly been restricted and closely monitored. Since early 2024, every purchase of 3 kg LPG at LPG bases has been required to be linked to the user's National Identification Number (*Nomor Induk Kependudukan* NIK), eliminating the anonymity that characterized the previous open distribution scheme. Consumers who were registered during 2023 are required only to present their national identity cards, while those not yet registered are directed to complete registration at the point of purchase. Through this mechanism, the government has gradually developed a national database of 3 kg LPG users, although strict purchase quotas per NIK have not yet been fully enforced at this stage.

A fundamental change in this phase lies in the approach to distribution oversight. Whereas control previously focused primarily on the number of cylinders leaving warehouses or LPG

bases, regulatory attention has shifted toward purchaser identity, transaction frequency, and purchase location. This shift enables the state to track who purchases 3 kg LPG, how frequently purchases occur, and at which distribution points transactions take place. This more individualized and measurable monitoring framework represents a turning point in the governance of LPG subsidies.

This strengthened control mechanism has been formally implemented since 1 June 2024 through the mandatory use of the Merchant Apps Pangkalan (MAP) digital application at all official LPG bases, as stipulated in operational directives issued by the government and the national energy distributor. Through this system, every 3-kg LPG transaction must be digitally recorded, including the buyer's National Identification Number (NIK), user category (household, micro-enterprise, fisherman, farmer, or retailer), as well as the volume and frequency of purchases. The MAP system replaces the previous manual logbook mechanism that was prone to recording errors and manipulation, while enabling regulators and distributors to monitor transaction patterns at the level of individual distribution bases. By capturing standardized identity and transaction fields, the system provides a digital trace that can be used to compare purchase behavior with registered user categories and to detect irregular purchasing patterns, thereby strengthening monitoring and improving the potential accuracy of subsidy targeting. Within the broader restructuring of the distribution system, retailers that previously operated informally have been encouraged to formalize their status as registered sub-bases and are required to record transactions through the same digital platform, which increases transparency and administrative oversight across the supply chain. By early 2025, the system had recorded more than 60 million registered NIK-based users in the database of LPG purchasers across different user categories. However, these registered records represent digitally identified buyers rather than verified eligible beneficiaries, meaning that registration reflects participation in the monitored transaction system rather than confirmed entitlement to subsidized LPG. This distinction is important because the digital registration process functions primarily as a monitoring instrument that enables future verification and policy targeting rather than as a direct determination of subsidy eligibility.

Overall, the period from 2024 to the present can be understood as a phase of strengthening data infrastructure and system readiness toward the implementation of a fully closed distribution scheme based on welfare eligibility criteria. The government has established NIK-based registration, mandatory MAP usage, comprehensive transaction recording at sub-distributors, and retailer formalization as prerequisites to ensure that 3 kg LPG is accessible only to low-income households, micro-enterprises, targeted farmers, and targeted fishermen. From this perspective, the LPG subsidy is no longer conceived as a universally low-priced commodity, but rather as a targeted social assistance instrument whose beneficiaries can be identified, impacts measured, and fiscal consequences controlled in pursuit of long-term fiscal sustainability.

Challenges in Policy Implementation

Despite the transition toward a beneficiary-based distribution scheme and increased digitalization, several challenges must be comprehensively understood to ensure the success of future subsidy reforms:

1. Persistently high targeting errors (*inclusion errors*), exacerbated by weak beneficiary verification systems. Although, normatively, the 3 kg LPG subsidy is intended for low-income households, micro-enterprises, targeted fishermen, and targeted farmers, in practice it continues to be widely consumed by non-target groups, including

middle- and upper-income households as well as commercial businesses such as restaurants, workshops, and service enterprises. Studies conducted by the Fiscal Policy Agency and the Ministry of Finance in 2022 indicate that approximately 40 percent of the benefits from the 3 kg LPG subsidy flowed to economically better-off households, while some poor households who should have been prioritized continued to face access constraints (Muharam et al., 2025). This proportion increased further by the end of 2025, when the Audit Board of Indonesia (*Badan Pemeriksa Keuangan*) revealed that LPG 3 kg distribution to beneficiaries not registered in the Integrated Social Welfare Data (*Data Terpadu Kesejahteraan Sosial* DTKS) persisted throughout 2024, amounting to IDR 33.84 trillion or the equivalent of 1,107,182,088 cylinders (Hidayatullah, 2025).

2. The absence of clear and enforceable eligibility criteria, along with the lack of a fair and transparent consumption quota mechanism. Weak data validation systems, the absence of a credible and real-time integrated socio-economic database, and limited institutional capacity at the local level to verify and regularly update beneficiary data further aggravate targeting inaccuracies. Even after National Identification Number (NIK)-based registration was introduced in 2023, substantive issues remain unresolved, as NIK functions primarily as an administrative identifier and does not reflect an individual's welfare status. Without eligibility criteria grounded in socio-economic conditions and proportional consumption limits, reliance on NIK-based systems risks merely transferring distribution problems from the field to digital platforms without fundamentally improving subsidy targeting accuracy.
3. A lengthy and complex distribution chain (SPPBE-agents-bases-sub-distributors/retailers-consumers), which is highly vulnerable to price manipulation and opportunistic behavior, particularly during localized supply shortages or when official oversight fails to reach all distribution points (Munandar, 2025). These vulnerabilities often result in practices such as hoarding and sales above the official maximum retail price (*Harga Eceran Tertinggi* HET).

Based on the discussion above, the challenges surrounding the 3 kg LPG subsidy are not solely related to the magnitude of budget allocations, but also to weaknesses in policy design and distribution mechanisms that have yet to ensure accurate targeting. Accordingly, the following policy recommendations are proposed to improve subsidy governance, strengthen beneficiary verification, and promote more efficient and fiscally sustainable distribution of 3 kg LPG:

Policy Recommendations

Strengthening the Beneficiary Database and Socio-Economic-Based Verification Systems

The government should integrate and regularly update the database of 3 kg LPG subsidy recipients based on credible and clearly defined socio-economic data. To date, reliance on NIK-based registration alone has proven insufficient to ensure accurate targeting, as NIK represents only administrative identity rather than actual economic conditions. Greater integration is required among the Integrated Social Welfare Data (DTKS), the P3KE database, the Micro and Small Enterprise Assistance Program (BPUM) database, and conversion-related data from the Ministry of Energy and Mineral Resources for farmers and fishermen. Verification systems should be continuous and dynamic rather than one-off exercises conducted at the initial registration stage. Beneficiary eligibility criteria must be clearly defined and measurable for example, based on specific welfare deciles or documented monthly income thresholds so that eligibility decisions can be applied objectively and consistently across regions.

Shifting from Commodity-Based Subsidies to Direct Subsidies (Cash Transfers)

This recommendation draws on comparative analysis of subsidy distribution schemes implemented in other countries. Transforming the LPG subsidy mechanism from a product price subsidy to a direct cash transfer for eligible beneficiaries would address several inherent weaknesses of price subsidies. Even under a closed distribution scheme, price subsidies remain vulnerable to leakage because, from an economic perspective, the existence of two prices (subsidized and non-subsidized) for the same product incentivizes wealthier consumers to seek access to subsidized goods, and no distribution verification system can fully eliminate this behavior. In contrast, direct subsidies in the form of cash transfers credited to beneficiaries' bank accounts or delivered through pre-loaded cards offer greater transparency, are easier to verify, and reduce vulnerabilities associated with complex physical distribution and price manipulation.

Preparing Alternative Energy Access for Non-Target Groups Excluded from the Subsidy System

The government must establish transitional mechanisms for non-target groups (economically better-off households and commercial enterprises) that will be excluded from the 3 kg LPG subsidy system, in order to prevent excessive economic disruption or widespread social resistance. For higher-income households, the government can facilitate access to non-subsidized LPG (including 3 kg and larger cylinder sizes) at full market prices through private distributors, ensuring continued energy availability at prices reflecting actual costs. For commercial enterprises, the government may offer targeted financing schemes or tax incentives to support a transition to alternative energy sources such as biogas or electricity, or facilitate access to industrial LPG cylinders (12 kg or larger) at business-specific prices that are more efficient than the 3 kg format. By preparing these alternatives, the government can manage the shift from subsidized to non-subsidized LPG demand in a structured and measurable manner, rather than relying on abrupt restrictions or prohibitions without viable solutions.

Conclusion

The transformation of the 3-kg LPG subsidy policy in Indonesia reflects a gradual shift from a commodity-based subsidy paradigm toward a beneficiary-targeted subsidy supported by digital governance. Initially introduced through the kerosene-to-LPG conversion program in 2007, the policy prioritized expanding access to cleaner household energy and reducing fiscal burdens through an open distribution system.

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However, persistent problems such as targeting inaccuracies, subsidy leakage, and rising fiscal pressure gradually exposed the limitations of universal price-based subsidies. This study contributes to the existing literature by proposing a phase-based analytical framework that explains the institutional evolution of the policy beyond single-period evaluations commonly found in previous studies. Empirically, the transformation can be understood through three cumulative phases: an expansion phase (2007–2018) that successfully accelerated energy conversion and reduced kerosene consumption but generated substantial inclusion errors; a transitional phase (2019–2023) characterized by regulatory adjustments and early experimentation with digital monitoring instruments; and a consolidation phase (2024–present) marked by the adoption of identity-based verification and digital transaction recording across the LPG distribution chain. By structuring these reforms into analytically defined phases, the study provides a systematic lens for understanding how subsidy governance evolves in response to fiscal pressures, administrative capacity constraints, and technological change.

Despite these institutional advances, several structural challenges continue to constrain the effectiveness of the reform. High inclusion errors, ambiguous beneficiary criteria, the absence of equitable consumption quotas, and weak integration of socio-economic databases indicate that digitalization alone cannot guarantee accurate subsidy targeting. In practice, digital monitoring systems depend on the quality, interoperability, and continuous updating of welfare databases; without reliable socio-economic data, digital tools primarily function as transaction recording mechanisms rather than as instruments of precise beneficiary verification. From the perspective of public policy theory, this finding highlights the importance of administrative capacity and data governance in determining the effectiveness of targeted social protection systems. Accordingly, the effectiveness of the LPG subsidy reform should be evaluated not only through regulatory changes or technological adoption but also through the coherence of eligibility criteria, the integration of national welfare databases, and the institutional capacity to verify and enforce subsidy allocation. Strengthening dynamic integrated data systems should therefore become the initial priority, followed by the clarification of beneficiary eligibility and consumption quotas, improved monitoring and enforcement along the distribution chain, and the gradual transition from commodity-based subsidies toward targeted direct cash transfers. Complementary transition mechanisms and alternative energy options for non-target users are also necessary to minimize social disruption. By linking policy periodization with governance and data-capacity analysis, this study offers an analytical framework that can support future evaluations of subsidy targeting reforms and guide policymakers in designing more equitable and fiscally sustainable energy subsidy systems.

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