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REFORMULATION OF RENEWABLE ENERGY INCENTIVES: A NORMATIVE REVIEW OF THE IMPLEMENTATION OF LIMITED-QUOTA FEED-IN TARIFFS IN INDONESIA

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Abstract: This article discusses the abolition of the net-metering scheme under Ministerial Regulation of Energy and Mineral Resources Number 2/2024, which reduces the economic viability of rooftop solar power plants in Indonesia, especially for households. This study uses a normative and comparative legal approach to examine the absence of post-net metering incentives. It offers a Feed-in Tariff (FiT) with limited quotas as an alternative. The results show that the abolition of net metering extends the payback period for rooftop solar power plants, making their adoption less feasible without additional support. Meanwhile, the experiences of other countries such as Japan and Bangladesh demonstrate the success of FiT in providing tariff certainty and grid stability. This research contributes by emphasizing the relevance of Article 33 of the 1945 Constitution in the context of energy justice, while proposing FiT with limited quotas as a more equitable and sustainable incentive. This scheme is expected to encourage the use of green energy in Indonesia in line with commitments to Sustainable Development Goals (SDGs) 7 and 13 commitments.

Artikel ini mengkaji dampak penghapusan skema net-metering melalui Peraturan Menteri Energi dan Sumber Daya Mineral (Permen ESDM) No. 2 Tahun 2024 menimbulkan implikasi signifikan terhadap keekonomian Pembangkit Listrik Tenaga Surya (PLTS) atap, khususnya di sektor rumah tangga. Kebijakan ini menghilangkan insentif finansial yang sebelumnya mendorong partisipasi masyarakat dalam transisi energi, sehingga menimbulkan kekosongan hukum dan ekonomi dalam mekanisme dukungan energi terbarukan. Penelitian ini bertujuan untuk menganalisis dampak hukum dan ekonomi dari penghapusan skema net-metering *serta menawarkan alternatif kebijakan berbasis* Feed-in Tariff (FiT) *dengan kuota terbatas guna menjaga keekonomian dan keadilan energi bagi pengguna PLTS atap. Penelitian ini menggunakan pendekatan hukum normatif dan komparatif, dengan analisis terhadap regulasi nasional dan praktik internasional di negara lain seperti Jepang dan Bangladesh. Data diperoleh melalui studi literatur, analisis peraturan perundang-*

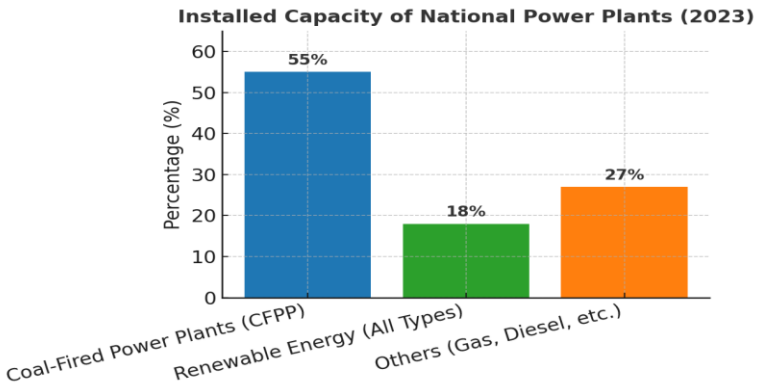
undangan, serta perbandingan kebijakan energi terbarukan di berbagai yurisdiksi. Hasil penelitian menunjukkan bahwa penghapusan net-metering memperpanjang periode pengembalian modal investasi PLTS atap, sehingga menurunkan kelayakan ekonomi di tingkat rumah tangga. Sebaliknya, penerapan Feed-in Tariff dengan mekanisme kuota terbukti di negara lain mampu memberikan kepastian tarif, menjaga stabilitas jaringan listrik, dan meningkatkan minat investasi energi terbarukan. Penelitian ini menegaskan pentingnya penerapan kebijakan berbasis keadilan energi sesuai amanat Pasal 33 UUD 1945 serta kontribusinya terhadap pencapaian SDG 7 dan SDG 13

Keywords: renewable energy; feed-in tariff; green energy; net-metering; incentive.

INTRODUCTION

Indonesia's dependence on fossil fuels accelerates resource depletion and increases Greenhouse Gas (GHG) emissions. In 2022, fossil fuel exploitation contributed 21.38% of total national emissions, in line with coal's dominance as the main source of electricity generation (Ahdiat 2023). The current capacity of steam power plants (PLTU) is around 40 GW and is projected to increase to 73 GW by 2030, potentially increasing emissions by up to 414 $MtCO_2e$ (Institute for Essential Services Reform 2023). The International Energy Agency (IEA) emphasizes that renewable energy is an energy resource that comes from natural processes and can be renewed continuously and can be produced without waiting a long time like fossil-based energy. Based on Image 1, data from the Directorate General of New, Renewable Energy and Energy Conservation (hereinafter referred to as Ditjen EBTKE) shows that as of December 2023, the installed capacity of new EBT reached 13.16 GW out of a national total of 72.97 GW, while PLTU still dominates 55% of the electricity mix (Kementerian Energi dan Sumber Daya Mineral 2024). This situation underscores the urgency of transitioning to new and renewable energy (EBT) to reduce dependence on fossil fuels while also reducing pollution and environmental impacts (Ahdiat 2024).

Image 1 - Installed Capacity of Power Plants (2023)



Source: Directorate General of New, Renewable Energy and Energy Conservation of the Ministry of Energy and Mineral Resources

The development of renewable energy in Indonesia is part of efforts to achieve the Sustainable Development Goals (SDGs), especially point 7 which emphasizes access to affordable, reliable, sustainable and modern energy for the community, and point 13 which focuses on climate action through the reduction of greenhouse gas emissions and the integration of climate policies into national strategies (Gunawan dan Dirkareshza 2025). This commitment is outlined in the Indonesia's National Medium-Term Development Plan through encouraging the use of clean and efficient energy. In the Indonesia's National General Energy Plan. Indonesia also targets a renewable energy mix of 23% by 2025 and 31% by 2050 (Sekretariat Kabinet Republik Indonesia 2017). With more than 3,600 GW of renewable energy potential, solar power has the largest potential at more than 3,294 MW, but its utilization is still very low, only about 0.01% (Firman Hidranto 2023). The development of Solar Power Plants needs to be prioritized as an effort to accelerate renewable energy targets, in accordance with the EBT classification in Law Number 30 of 2007 concerning Energy (Rumbayan 2020).

The development of renewable energy, particularly rooftop solar PV, is fundamentally in line with Article 33 paragraph (3) of the 1945 Constitution of the Republic of Indonesia and Article 4 paragraph (2) of the Energy Law, which emphasize that the utilization of natural resources must be directed toward the greatest prosperity of the people in a sustainable manner (Alim dan Thamrin 2023). However, the abolition of the net-metering scheme through The Ministry of Energy and Mineral Resources Regulation 2/2024 on Rooftop Solar Power Systems Connected to the Public Electric Power Supply Grid (hereinafter referred to as Permen of ESDM PLTS Atap 2024) undermines this constitutional principle by limiting public access, especially for households, to the direct benefits of solar energy (Institute for Essential Services Reform 2024). Previously, net-metering functioned as an instrument of energy justice, enabling rooftop solar users to channel excess electricity into the State Electricity Company grid and receive reductions in their electricity bills (Lin, Suhaiza, dan Nurain 2025).

According to the Institute for Essential Services Reform (IESR), the removal of this scheme risks obstructing the achievement of the National Strategic Project target of 3.6 GW of rooftop solar PV and the 23% renewable energy mix target by 2025, while simultaneously slowing down the household-level adoption of green energy. This situation raises critical questions as to whether the current policy truly reflects the constitutional mandate and the principle of energy justice as enshrined in Article 33 of the 1945 Constitution.

The abolition of the net-metering scheme poses challenges for the development of rooftop solar power plants, especially in the household sector, which has relied on monthly electricity cost savings as its main motivation. As an alternative, *Feed-in Tariff (FiT)* can be an incentive mechanism whereby PLN purchases electricity from rooftop solar PV owners at a competitive fixed rate. With this scheme, even though *net-metering* is abolished, solar PV owners still receive compensation for the electricity exported to the PLN grid (Szendrei dkk. 2025). International experience shows the success of FiT implementation (Pambudi dkk.

2025). In Bangladesh, FiT has encouraged the increased adoption of rooftop solar power plants through fixed tariffs and long-term contracts (Ahsan Kabir dkk. 2023). Meanwhile, in Japan, the implementation of FiT since 2012 has successfully increased PV capacity rapidly to tens of gigawatts with high initial tariffs and 10-20 year contract guarantees (Kimura, Lundberg, dan Kåberger 2025). This scheme has been able to drive solar energy growth and expand the adoption of green energy at the community level, making it a major driver of the clean energy transition in the country. From the perspective of Roscoe Pound, who saw law as a tool for social engineering, changes in energy policy should be able to drive societal behavior toward a state-desired direction, such as increased investment in new and renewable energy (Pound 1974).

Previous research conducted by (Panjidinata 2024) and (Rizqi Dzulkifli et al., 2024) showed that government policies, specifically the elimination of net-metering in MEMR Regulation No. 2 Year 2024, negatively impacted the development of rooftop solar PV. They Previous research conducted by showed that government policies, specifically the elimination of net-metering in Permen of ESDM PLTS Atap 2024, negatively impacted the development of rooftop solar PV. They highlighted regulatory uncertainty and lack of incentives as the main factors hindering investment, as well as decreasing the interest of the public and businesses in adopting solar energy. Meanwhile, a recent study from Bangladesh (Kabir et al., 2023) also emphasizes the importance of incentive schemes such as FiT to increase user participation, and shows that FiT is more profitable than net-metering in terms of economics for small customers. All three journals agree that a clear and competitive regulatory and incentive framework is needed to encourage the adoption of renewable energy.

However, there are fundamental differences in the approach and focus of each study. The journal from (Kabir dkk. 2023) in Bangladesh focuses on the technical-economic evaluation of billing schemes for industrial PV systems in two main regions, and offers a quantitative comparison between net metering and FiT. In contrast, the studies of (Nandito., 2024) and (Nainggolan dkk. 2025) mostly discuss national regulatory and policy aspects without elaborating on specific incentive schemes such as FiT in depth. However, no research has specifically examined the impact of *net-metering* abolition on households in Indonesia while proposing FiT with a limited quota as a legal solution that is both constitutional and consistent with the principle of energy justice. Therefore, this study offers a novel perspective in the discourse on renewable energy policy in Indonesia.

Based on this background, this article aims to examine the impact of the abolition of the net-metering scheme on the use of green energy through rooftop solar PV in Indonesia. In addition, this article also aims to analyze how the application of FiT with a limited quota can increase the use of green energy after the abolition of the net-metering scheme. The discussion will be structured by first analyzing the current regulatory framework, then presenting comparative insights from other jurisdictions that have implemented FiT schemes, and finally offering an evaluation of how such a mechanism could be adapted in Indonesia.

RESEARCH METHOD

This research employs a normative legal method with a comparative approach. The normative method is chosen because the study focuses on the analysis of statutory provisions, legal doctrines, and constitutional principles concerning renewable energy, rather than on empirical field data (Djulaeka dan Rahayu 2022). The comparative approach is used to examine how FiT schemes have been implemented in countries such as Bangladesh and Japan, providing lessons for their potential adaptation in Indonesia. This approach is considered more appropriate than empirical research due to the limited availability of household-level quantitative data following the abolition of net-metering, as well as the primary aim of the study to assess the consistency of policy with constitutional and legal principles of energy justice.

The data of this research is obtained through library research consisting of three categories of legal materials. Primary legal materials include statutory regulations such as the 1945 Constitution of the Republic of Indonesia, Law Number 30 of 2007 concerning Energy, Presidential Regulation Number 112 of 2022, and Ministerial Regulation of Energy and Mineral Resources Number 2 of 2024. Secondary legal materials comprise peer-reviewed journals, academic books, and scientific articles, as well as non-academic reports from research institutions such as IESR and IEA, government press releases, and media publications. In particular, this study draws upon peer-reviewed scholarship such as Kabir et al. (2023) on the effectiveness of FiT in Bangladesh and Keiji Kimura et al (2025) on the Japanese experience with FiT, which provide comparative insights into how FiT schemes can support renewable energy adoption. Tertiary legal materials include legal dictionaries and encyclopedias used to clarify terminology.

The analysis technique applied is descriptive-qualitative, by systematically describing, reviewing, and evaluating the relationship between existing legal norms, legal theories, and policy practices in other jurisdictions. The results are then used to formulate legal arguments and propose alternative policies, particularly the design of a limited quota FiT scheme, as a more equitable and sustainable incentive for rooftop solar adoption after the abolition of net-metering in Indonesia.

RESULT AND DISCUSSION

The Impact of the Abolition of the Net-Metering Scheme on the Use of Green Energy

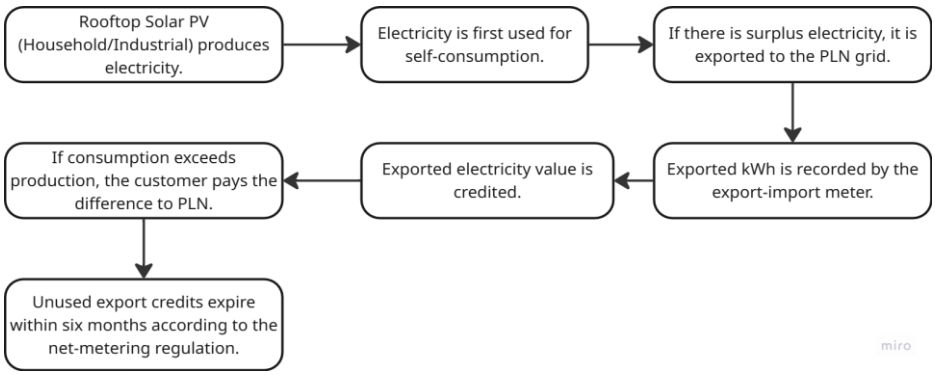
The utilization of solar energy in Indonesia is still at a very early stage, despite its enormous potential. Meanwhile, solar irradiation is at a fairly high level of intensity throughout Indonesia, as daylight lasts longer and cloud cover is relatively low throughout the year (Dewi dkk. 2024). This geographical condition provides a distinct advantage for the development of solar energy technology. Ironically, this potential has not been optimally utilized in policy and implementation in the energy sector (Institute for Essential Services Reform 2019). In fact, solar energy can be a strategic alternative to reduce dependence on fossil fuels and face the challenges of national energy security.

Although Indonesia has enormous solar energy potential, its current utilization is still very limited. Data shows that the installed capacity of solar power plants in Indonesia has only reached around 0.3 GW or only around 0.01% of the total national energy capacity, making it the smallest contributor among other renewable energy sources. In fact, international projections show that solar energy could become a major energy source in the transition to a low-emission energy system (Kurnia 2025). In the Net Zero Emissions (NZE) scenario, solar energy is projected to be the largest contributor, with global capacity additions reaching 65 GW by 2030, far beyond the current policy scenario (International Energy Agency 2024).

Presidential Regulation No. 22/2017 on the National Energy General Plan is Indonesia's energy management roadmap until 2050, containing various strategic policies to achieve the renewable energy mix target. One of the provisions in this regulation is to require the utilization of solar cells on a minimum of 25% of the roof area of luxury houses, housing complexes, and apartments (Supriyanto dkk. 2022). This provision aims to make the utilization of solar energy widely applicable in the construction and management of environmentally friendly buildings (Duma dkk. 2025). It is expected that with this obligation, the use of renewable energy will increase and help reduce carbon emissions (Sukmawati dan Hariyani 2025).

Based on the presidential regulation, Rooftop Solar PV is one of the new renewable energy solutions that the government encourages (Damayanti dan Dinaseviani 2024). Rooftop Solar PV is a power generation system that utilizes solar panels installed on the roof of a building to convert sunlight into electrical energy (Afifi dkk. 2025). This system provides benefits in the form of electricity bill savings for users and opens opportunities for the community to participate in the utilization of clean energy(Rosyad, Wahyudi, dan Noakes 2020). Previously, the net metering scheme was the main alternative in attracting community participation in installing rooftop solar power plants. This is because *net-metering* allows users to export excess electricity generated to the PLN network and get a reduction in electricity bills (Wiriana 2025).

Image 2 – Regulation on Net-Metering Scheme

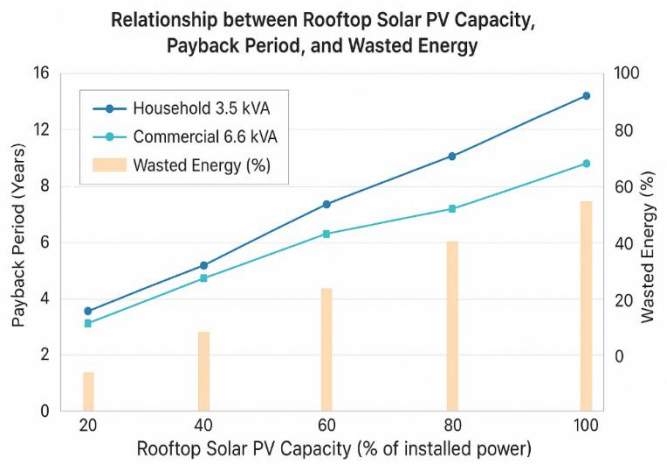


Source: The Ministry of Energy and Mineral Resources Regulation 26/2021

Image 2 explains that in this scheme, energy exported to the grid is recorded as kWh Export, while energy taken from the grid is recorded as kWh Import. Every month, the amount of energy used is calculated from the difference between Import kWh and Export kWh (Fikry dan Triadi 2024). If the amount of electricity exported is greater than that imported, the excess energy is recorded as electricity credits that can be used to reduce the following months' bills (Patabang 2022). Although rooftop solar users continuously experience energy surpluses, they do not receive payments from PLN because the excess energy is not converted into cash. Since the threshold for the validity period of electricity credits has been stipulated in The Ministry of Energy and Mineral Resources Regulation 26/2021 concerning Rooftop Solar Power Plants Connected to the Electricity Network of Electricity Supply Business License Holders (Permen of ESDM PLTS Atap 2021), which is for 6 (six) months from the time the electrical energy is exported to PLN's grid, after which the remaining unused credits will be removed.

The net-metering scheme has previously been a major attraction for rooftop solar power users, including households, because it allows excess electrical energy generated to be channeled to the PLN grid so that it remains economical (Pramadya dan Kim 2024). Moreover, amidst the high price of energy storage batteries, the net metering scheme is an alternative solution so that excess energy is not wasted and remains economical. Although this scheme does not remove the entire burden of electricity bills, the existence of *net-metering* remains a solution to several problems for rooftop solar power users. But in reality, this scheme is no longer guaranteed in the latest regulation, which could potentially hinder the adoption of rooftop solar power in the industrial and household sectors (Institute for Essential Services Reform 2024).

Image 3 - Impact of Rooftop PV Capacity on Payback Period and Wasted Energy



Source: Indonesia Solar Energy Outlook 2025

The Indonesian government abolished the *net-metering* scheme through Permen of ESDM PLTS Atap 2024, which replaces the 2021 regulation. The new regulation removes

the customer's right to channel excess electricity to the PLN grid and receive a bill reduction. Without an energy import-export mechanism, the attractiveness of rooftop solar power plants is significantly reduced, especially for households that rely on monthly cost savings as the main motivation. This situation could potentially cause people to delay or even cancel the installation of rooftop solar power systems, thereby hindering the adoption of green energy, especially at the household level (Rahmanta dkk. 2023).

Based on IESR data (2024), the elimination of the *net-metering* scheme causes household customers who still want to use rooftop solar power plants to adjust the system capacity so as not to produce excess energy surplus. Without an import-export mechanism, the surplus energy is not converted into electricity bill savings and is potentially wasted. Image 3 shows that for household customers with a power capacity of 3.5 kVA, increasing the capacity of rooftop solar power plants to close to 100% of the installed electricity capacity is directly proportional to the increase in the payback period. Under these conditions, the time needed to break even can extend to about 20 years. This is because the excess electricity production cannot be exported to the PLN grid so that some of the energy produced becomes unutilized (IESR 2025).

For 6.6 kVA commercial customers, the increase in capacity also increases the payback period, but the impact is not as great as for households. Meanwhile, the proportion of wasted energy (shown by the orange bar) increases sharply as the capacity increases, especially for households that tend to have lower electricity consumption during the day. This condition confirms that without a net-metering scheme, the installation of large capacity rooftop solar power plants becomes uneconomical for households, so additional alternatives are needed to maintain the economics of the investment.

Table 1 - Payback Period Simulation for 3 kWp Rooftop Solar Power Plant

Condition	Monthly Electricity Bill	Percentage of Savings	Monthly Savings	Payment After Savings	Annual Savings
With Net-Metering	600.000	90%	540.000	60.000	6.480.000
Without Net-Metering	600.000	50%	300.000	300.000	4.320.000

Source: Author Ideas

Table 1 to provide a concrete illustration, a simple simulation was conducted on a household with 2,200 VA of electricity and an energy requirement of around 13 kWh per day, equivalent to an electricity bill of Rp600,000 per month (Tarigan 2022). If the household installs a 3 kWp rooftop solar power system with an investment cost of IDR 57.2 million, the potential savings will differ significantly between conditions with and without net metering (Wuri 2024). With the net metering mechanism, excess electricity generated during the day can be exported to the PLN grid and credited back at night, so that almost 90% of monthly electricity needs can be covered by solar power. In this case, the household only pays around

10% of the bill or IDR 60,000 per month, resulting in savings of IDR 540,000 per month or IDR 6.48 million per year. Thus, the payback period is achieved in ±9 years. Conversely, without the net-metering scheme, surplus electricity during the day cannot be utilized and is wasted, so that the solar power plant only covers about 50% of electricity needs. Households still have to pay IDR 300,000 per month, resulting in savings of only IDR 300,000 per month or IDR 4.32 million per year. Under these conditions, the payback period extends to approximately 13 years, approaching the technical lifespan of the inverter, making rooftop solar power systems less economically attractive for households.

These results are consistent with the findings of IESR Executive Director Fabby Tumiwa, who stated that the removal of this scheme makes small capacity installations financially unviable. Without net-metering, users must purchase expensive storage batteries or remain dependent on PLN electricity, which is cheaper at night than the cost of independent storage (Misbahuddin, Mapeasse, dan Mayasari 2024). With these considerations, the elimination of the net-metering scheme not only reduces public interest but also lowers the attractiveness of investment in the rooftop solar power sector. Regulatory uncertainty, weak incentives, and rising system costs are major barriers to the adoption of solar energy, which should be driving the national energy transition. This policy also sends a negative signal to potential household users who need long-term certainty about the financial benefits, thereby slowing efforts to expand the use of renewable energy at the community level.

In fact, if this policy is designed with a larger or more attractive incentive scheme, rooftop solar power has the potential to become one of the spearheads in efforts to decarbonize the national energy sector and reduce dependence on fossil fuels. Therefore, a re-evaluation of this policy is urgently needed to ensure that it remains in line with the vision of a sustainable energy transition. Support for rooftop solar power plants is not only a technical issue, but also reflects the government's commitment to fulfilling the global development agenda, particularly SDG 7 on ensuring access to affordable, reliable, sustainable, and modern energy, and SDG 13 on addressing climate change through the integration of climate policies into national policies.

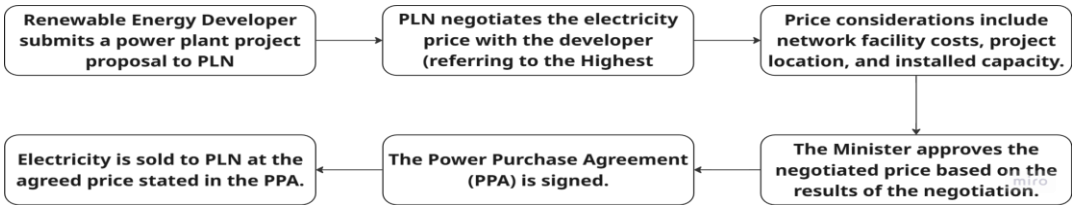
Application of Feed-in Tariff with Limited Quota for Green Energy

Indonesia's EBT mix target of 23% by 2025 is predicted to be difficult to achieve. According to National Energy Council (DEN) member Abadi Poernomo, the current achievement is only around 14%, and will most likely only reach 17% by 2025. This oversupply actually hinders the addition of new power generation capacity from renewable energy, including rooftop solar power plants, because energy demand does not grow proportionally. Under these conditions, investment in the renewable energy sector becomes unattractive without concrete supportive policies (Katadata 2024).

Rooftop solar PV is one of the strategic solutions to support green energy because it utilizes abundant solar energy, especially in the Indonesian region. However, the investment

attractiveness of rooftop solar deployment is highly contingent upon regulatory certainty, particularly concerning electricity purchase tariffs. The absence of a clear tariff framework discourages potential investors, especially in small- and medium-scale projects. Deputy Chairman of Commission VII of the House of Representatives - Eddy Soeparno, emphasized that tariff regulation plays a pivotal role in ensuring predictable investment returns. The *FiT* mechanism is considered the best tariff scheme that can provide this certainty. Therefore, the government is encouraged to immediately issue a Presidential Regulation regarding EBT electricity tariffs, including tariffs for rooftop solar power plants.

Image 4 - Current Feed-in Tariff scheme in Indonesia



Source: Presidential Regulation No. 112/2022

Currently, Indonesia has not officially implemented the FiT scheme in its existing regulations (Nurhidayanti 2025). FiT is a mechanism whereby the government or PLN purchases electricity from new renewable energy (NRE) plants, such as solar power plants, at a predetermined fixed rate, generally higher than the market rate to encourage green energy. However, until now, renewable energy policy in Indonesia still refers to Presidential Regulation No. 112 of 2022, as shown in Image 4 which regulates the Highest Benchmark Price (HPT) for the purchase of electricity from renewable energy by PLN.

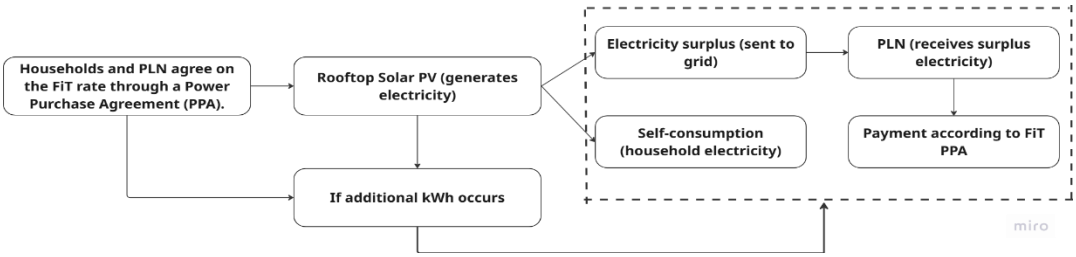
The fundamental difference between FiT and HPT as stipulated in Presidential Regulation No. 112 of 2022 lies in the certainty of prices and guaranteed income for renewable energy developers. This makes FiT more attractive to investors and small-scale power plant owners due to its stable and predictable nature. Conversely, the HPT mechanism in Article 5 of Presidential Regulation 112/2022 only sets a maximum reference price as an upper limit in the negotiation process between PT PLN (Persero) and developers. Article 6 emphasizes that this price is not automatically applicable but must be negotiated with PLN and requires approval from the Minister of Energy and Mineral Resources. Additionally, for certain types of power plants, there are provisions without price escalation throughout the duration of the power purchase agreement (PPA) (Setiawan dkk. 2022).

Therefore, HPT is more flexible for PLN as an off taker, but at the same time creates legal and economic uncertainty for developers because the final tariff may be lower than the benchmark price and its stability is not guaranteed. In this context, FiT is considered more consistent with the goal of creating a conducive investment climate in the energy transition, while HPT tends to be oriented towards protecting the interests of PLN. In the Indonesian context, the application of FiT with limited quotas can be a strategic step to increase the use of green energy in the household sector after the elimination of net metering.

In this research proposal, the limited quota FiT scheme is aimed at middle- to upper-class households, particularly customers with a power capacity of 3,500–5,500 VA and ≥6,600 VA. This consideration is based on the national electricity tariff structure, whereby low-power customers still receive government support in the form of subsidies or tariff discounts. Furthermore, in accordance with Article 4 paragraph (1) of Minister of Energy and Mineral Resources Regulation No. 7 of 2024, the 900 VA customer group is categorized as poor and underprivileged households, so they are not yet potential targets for independent investment in the renewable energy sector. Although 2,200 VA power no longer receives full subsidies, this group is still classified as lower-middle-class households. Therefore, households with 3,500 VA and above are considered the most rational initial target for FiT implementation, as they have more adequate financial capacity and are not burdened by state subsidies.

Based on PLN data, the electricity tariff applicable to middle- to upper-class households is Rp1,699.53 per kWh. In the proposed FiT design, PLN purchases electricity from rooftop solar power users at a tariff of Rp1,199.53 per kWh. The difference of Rp500 per kWh is allocated to cover PLN's operational costs, such as network maintenance, distribution, and administrative expenses. This scheme not only provides incentive certainty for households using PLTS, but also ensures financial sustainability for PLN as the main off taker.

Image 5 - Household Rooftop Solar PV Feed-in Tariff Mechanism Concept



Source: Author Ideas

Image 5 illustrates the mechanism for implementing FiT for residential rooftop solar power plants through a process involving consumers, PT PLN, and the government as the regulator. First, residential customers who wish to install rooftop solar power plants submit an installation application and obtain an operational certificate in accordance with applicable technical regulations. Once the rooftop solar power system is operational, the electricity generated is used to meet household electricity needs. If there is a surplus of electricity, the excess is exported to the PLN grid. Under the FiT scheme, surplus electricity that is exported to PLN's grid is priced at a fixed rate that has been determined at the beginning of the contract through a power purchase agreement (PPA) between the customer and PLN. Payment is made based on the amount of energy exported to the grid, at the prevailing tariff during the contract period. This tariff is set by the government as a benchmark price that applies nationally, thus providing price certainty for household customers (Suryani dkk. 2025).

This mechanism benefits both parties: household customers receive financial compensation that can accelerate the payback period of rooftop solar PV installations, while PLN receives additional renewable energy supply to help meet national energy mix targets. With a fixed and transparent tariff, the FiT scheme is expected to increase household investment interest in rooftop solar PV, reduce dependence on fossil-based electricity, and support the achievement of SDGs points 7 and 13 related to clean energy and tackling climate change. The implementation of FiT in Japan and Bangladesh shows how price certainty and long-term contracts can accelerate the penetration of renewable energy. In Japan, the implementation of FiT for household solar power plants (<10 kW) sets competitive tariffs with long-term contracts for 20 years. This scheme has succeeded in maintaining public interest in installing household rooftop solar power plants while controlling the subsidy burden (Kimura dkk. 2025). Meanwhile, Bangladesh implements FiT for medium-scale solar power generation schemes with rates of USD 0.10–0.13/kWh and long-term contracts of 15–20 years, providing certainty of return on investment for local developers (Ahsan Kabir dkk. 2023). Both countries demonstrate that FiT can reduce investment risk and increase the attractiveness of renewable energy projects, especially in the household and small community sectors.

Image 6 - Formula for Determining Household FiT Quotas (3,500 VA)

$$Energy(kWh/month) = Capacity(kW) \times OperatingHoursPerDay \times Days$$

$$Energy = 3.5 \times 12 \times 30 = 1,260 \text{ kWh/month} \approx 1,200 \text{ kWh}$$

Source: Author Ideas

The FiT scheme with limited quotas can serve as a mechanism to maintain the stability of the electricity system while encouraging the use of green energy in households. In this proposal, each household is limited to a maximum quota of 1,200 kWh per month for electricity that can be purchased from PLN. Based on Image 6, the 1,200 kWh per month quota is based on a simulation of the electricity needs of a medium-sized household with an installed capacity of 3,500 VA (equivalent to ±3.5 kW). Assuming an average usage of 12 hours per day for 30 days, the estimated consumption is 1,260 kWh per month. This figure was then rounded down to 1,200 kWh as the quota limit to be more conservative and in line with PLN's network capacity.

These restrictions serve as a control mechanism to ensure that rooftop solar power exports do not exceed grid capacity and pose technical risks. Quotas also ensure that fixed tariff incentives are provided fairly and accurately, with the flexibility to adjust in line with market and technological developments. Similar practices are applied in Japan and Bangladesh, where fixed tariffs are combined with technical restrictions or quotas to avoid oversupply. Thus, FiT with limited quotas in Indonesia not only provides price certainty and economic incentives for households, but is also adaptive to the conditions of the national electricity system and fills the incentive gap following the abolition of net metering.

The implementation of FiT with limited quotas can also be seen as a concrete form of social engineering as referred to by Roscoe Pound. Through this scheme, the law not only sets a fixed tariff that provides income certainty for rooftop solar power plant owners, but also regulates electricity export quotas to maintain the stability of the national electricity system. Thus, FiT regulations with limited quotas serve to direct public behaviour to invest in renewable energy, while maintaining the security of the electricity grid. This demonstrates how the law can play an active role in achieving broader social goals, namely helping to achieve the SDGs, particularly points 7 and 13. This policy can be a strategic step to expand the use of green energy at the household level after the abolition of the net-metering scheme, while maintaining the resilience of the national electricity system (Siregar dan Rigitta 2021).

However, in the context of FiT implementation in Indonesia, this scheme can be integrated with a limited quota system set by the government or holders of Electricity Supply Business License for Public Interest (IUPTLU) such as PLN. This quota serves as the maximum limit of rooftop solar PV capacity that can receive FiT tariffs in a region within a certain period, thus maintaining electricity system stability and preventing oversupply that can overload the grid. By setting quotas that are transparent, fair, and based on regional demand planning, the government can ensure that FiT incentives are well-targeted, while still maintaining investment attractiveness for households. This approach is expected to fill the incentive void after the elimination of the net metering scheme, while maintaining the sustainability of the national power system.

Conclusion

Based on the results of the study, the abolition of the net-metering scheme under Permen ESDM No. 2 of 2024 has been shown to reduce the economic viability of residential rooftop solar power systems, as evidenced by the longer payback period resulting from surplus energy no longer being compensated. This situation reduces investment interest and makes rooftop solar power systems less attractive to the public. As an alternative, the implementation of a FiT with limited quotas offers a fairer and more sustainable solution. This scheme provides certainty regarding the price of electricity exported to the PLN grid, while maintaining the stability of the electricity system through quota restrictions. Thus, the FiT quota can become a legal instrument that encourages public participation in the energy transition, in line with Roscoe Pound's idea of law as a means of social engineering.

To operationalize this framework, the government should issue a regulation at the level of a Presidential Regulation that explicitly governs FiT schemes for rooftop solar. A reasonable starting tariff would be set at IDR 1,199.53/kWh for medium-to-large household consumers (3,500–5,500 VA and ≥6,600 VA), slightly lower than PLN's retail tariff of IDR 1,699.53/kWh, thereby ensuring both household incentives and PLN's operational margin. Furthermore, the volume of electricity eligible for FiT purchases should be capped at 1,200 kWh per household per month to prevent oversupply and protect grid stability. This design is consistent with international experiences in Japan and Bangladesh, where fixed tariffs, long-

term contracts, and quota mechanisms have been combined to safeguard system reliability while ensuring investment attractiveness. [*W*]

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