IISD International Institute for Sustainable Development

Global Subsidies Initiative

ACHIEVING A FOSSIL-FREE RECOVERY IN INDONESIA
Brief #4

Switching Fossil Fuel Subsidies in Indonesia to Support a Green Recovery

Lasse Toft Christensen, Anissa Suharsono, Theresia Betty Sumarno[1]

July 2022

Introduction

Indonesia's road to a green recovery from COVID-19 still has a way to go. President Jokowi's 2022 budget proposal made this clear by including significant amounts in spending on infrastructure, health, and social protection, including an allocation to affordable and reliable energy—which in Indonesia typically means fossil fuels ("Jokowi introduces," 2021).

Looking toward 2030, Indonesia has ambitious climate targets that will require a massive scaling up of new and renewable energy. In its Nationally Determined Contribution to the United Nations Framework Convention on Climate Change, Indonesia has committed to unconditional emissions reductions of 29% compared to business as usual, or 41% subject to the availability of sufficient international support. The energy sector—and the power sector in particular—is pivotal to achieving these targets, and the Government of Indonesia urgently needs to start investing in a green recovery and transition (Perusahaan Listrik Negara [PLN], 2021).

Previous research by the International Institute for Sustainable Development has shown that Indonesia's recovery spending so far did not prioritize a green recovery (Sumarno & Sanchez, 2021). Indonesia's 2020 COVID-19 recovery budget supported the fossil fuel sector heavily via IDR 95.3 trillion (USD 6.6 billion)[2] of direct support to its state-owned enterprises (SOEs), compared to some tax incentives that could not be quantified for renewable energy developers (Sumarno & Sanchez, 2021). In addition, Indonesia is still far from achieving its 23% renewable energy target by 2025, and the latest estimates by the Director General

[1] The authors thank Richard Bridle, Lourdes Sanchez and Philip Gass of IISD for helpful comments on a draft of this brief.

[2] The currency exchange rate used here is IDR 14,400/USD, based on the official exchange rate in the Indonesian State Budget 2020 (Ministry of Finance, 2021a).

of New and Renewable Energy suggest that IDR 500 trillion (USD 34.7 billion) in total is required to achieve this target (Mediatama, 2021).

This brief is part of the series "Achieving a Fossil-Free Recovery in Indonesia" and evaluates a range of options for the Government of Indonesia to achieve a green recovery.

In a previous brief, Financing Green Recovery From Fossil Fuel Taxation and Subsidy Reform (Sumarno & Sanchez, 2021), the International Institute for Sustainable Development has shown how Indonesia could raise up to IDR 166 trillion (USD 11.5 billion)a year by reforming subsidies to transport fuels and coal while at the same time implementing an additional but modest tax to these fuels.

In this brief, we look at how Indonesia could use these funds to accelerate the green energy transition while supporting the recovery of the economy by reallocating fossil fuel subsidies to support clean energy.

How to Shift Subsidies From Fossil Fuels to Clean Energy

Policies that reallocate revenues from reductions in fossil fuel subsidies or increases in taxation to accelerate the clean energy transition and compensate vulnerable affected groups can be an effective—and cost-effective—climate change mitigation strategy.

These policies can support both the energy transition and economic recovery by identifying forms of clean energy that have a strong potential to also achieve social and economic development. The specific areas will depend on the local context and include options such as investing in energy efficiency, energy access, decarbonization of transportation, or transforming the power sector to allow a higher intake of renewables (Sanchez et al., 2021).

While in this paper we focus on redirecting fossil fuel subsidies and taxes toward the clean energy transition, they can be also redirected to other areas, such as health, education, infrastructure, and so on.

This mechanism is not a new concept in Indonesia. When taking office in 2015, the Jokowi administration reformed subsidies to transport fuels. This resulted in IDR 211 trillion (USD 15.6 billion) in savings, and at the same time, an increase in investment in social and welfare programs, as well as various infrastructure projects (Pradiptyo et al., 2016). These reform efforts followed a similar playbook to the extent that subsidies were removed, and investment in other areas supporting social development was increased, even though reforms did not focus directly on energy access or providing support to clean energy. Since 2015, subsidies have sneaked back into government budgets and are once again significant, presenting a new opportunity for reform and the raising of public funds for other social and development purposes. Indeed, Indonesia's total fossil fuel subsidy bill was IDR 206 trillion (USD 14.3 billion) in 2020. This amount includes subsidies to coal, electricity, and transport fuels as well as support to SOEs as part of the corresponding COVID-19 recovery package. It also includes liquefied petroleum gas subsidies, whose reform was recently approved by Indonesia's Budget Institution to be implemented from July 2022 (Umah, 2020).

This brief looks at how reallocating fossil fuel subsidies and taxes to clean energy can support Indonesia's energy transition while promoting Indonesia's economic recovery from COVID-19. It explores how this mechanism can be used to support renewable energy development through improved feed-in tariffs and by overcoming land acquisition barriers, as well as through investing in a greener PT Perusahan Listrik Negara (PT PLN), energy efficiency measures and energy access.

Reallocating Fossil Fuel Subsidies for Renewable Energy

There are many ways in which redirecting harmful subsidies and money raised from fossil fuels to clean energy could play an important role in Indonesia's green transition.

First and foremost, Indonesia is in urgent need of boosting its renewable energy base. In 2020, the renewable energy share in Indonesia stood at 11.2% (Dewan Energi Nasional, 2021). This is far from the target of 23% clean and renewable energy by 2025, as stipulated in Indonesia's Nationally Determined Contribution under the United Nations Framework Convention on Climate Change (Republic of Indonesia, 2021).

In its recently updated General Plan for Electricity (RUPTL 2021–2030), PT PLN plans for an additional 20.9 GW of new and renewable electricity before the end of 2030 (see Table 1).

Table 1. Planned renewable energy capacity additions in RUPTL 2021–2030

No	Type	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
1	Geothermal	MW	136	108	190	141	870	290	123	450	240	808	3,355
2	Large Hydro	MW	400	53	132	87	2,478	327	456	1,611	1,778	1,950	9,272
3	Mini / Microhydro	MW	144	154	277	289	189	43	-	2	13	6	1,118
4	Solar	MWp	60	287	1,308	624	1,631	127	148	165	172	157	4,680
5	Wind	MW	-	2	33	337	155	70	-	-	-	-	597
6	Biomass / Waste	MW	12	43	88	191	221	20	-	15	-	-	590
7	Base NRE	MW	-	-	-	-	-	100	265	215	280	150	1,010
8	Peaker NRE	MW	-	-	-	-	-	-	-	-	-	300	300
	Total	MW	752	648	2,028	1,670	5,544	978	991	2,458	2,484	3,371	20,923

Source: PLN, 2021.

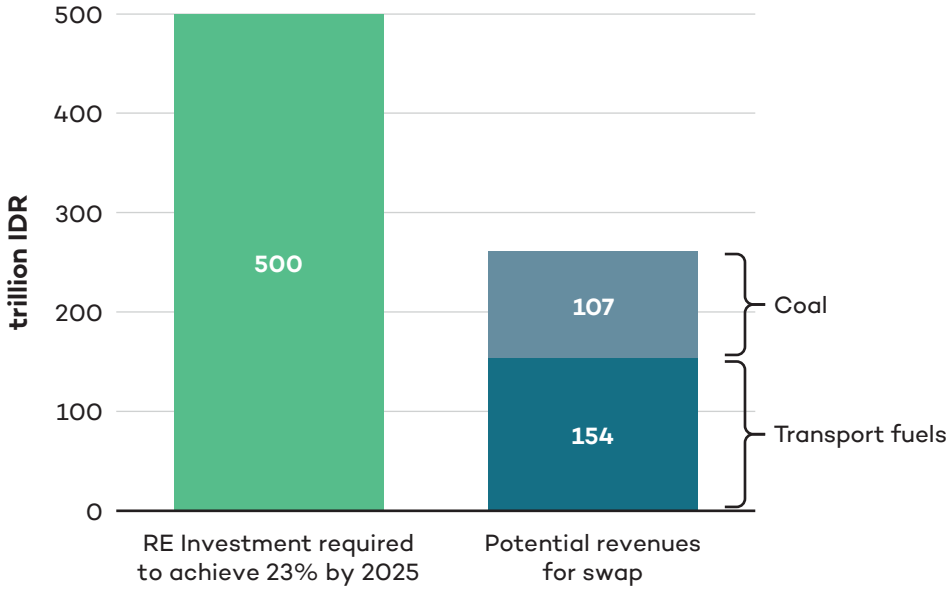
However, for Indonesia to achieve its 23% target, it is estimated that 22.6 GW of renewable energy is needed before 2025 (Danish Energy Agency and Ministry of Energy and Mineral Resources, n.d.). At the Indonesia Energy Transition Dialogue 2021,[3] the Director General of New Renewable Energy and Energy Conservation estimated that Indonesia is going to need approximately IDR 500 trillion (USD 34.7 billion) of investment to reach the renewable

[3] Indonesia Energy Transition Dialogue is an annual event held by the Institution of Essential Service Reform to discuss the current situation of Indonesia energy transition.

energy-based power plants' proportion of the RUPTL toward 2030 (Mediatama, 2021). This is roughly similar to estimates from the Institute for Essential Services, which has calculated the corresponding investment value for new and renewable energy (NRE) to be around USD 25 billion–USD 30 billion (approximately IDR 420 trillion) (Umah, 2020).

In comparison, Indonesia could raise up to IDR 166 trillion (USD 11.5 billion) by reforming transport fuels and coal subsidies and subsequently taxing them according to their real costs to society (Sumarno & Sanchez, 2021). If the current amount of taxes already raised from these fuels is added to this, the amount goes up to IDR 261 trillion (USD 18.1 billion). This is more than half the investment needed to achieve the 23% target, according to several estimates, and more than what is needed for PT PLN's distribution investment needs (see Figure 1).

Figure 1. Potential revenues that can be reallocated to support renewable energy development in Indonesia



Sources: Danish Energy Agency and Ministry of Energy and Mineral Resources, n.d.; Sumarno & Laan, 2021; Sumarno & Sanchez, 2021; Laan et al., 2021.

Feed-in Tariff Barrier

One of the main culprits often highlighted when looking at the low deployment of renewable energy in Indonesia is the fact that the government has implemented an unattractive renewable energy tariff (Bridle et al., 2018). The current regulation governing renewable energy pricing is Permen ESDM no. 4/2020, which acts as an amendment to Permen ESDM no. 50/2017 on *Utilization of Renewable Energy Resources for Electricity Supply*.[4] Under this regulation, renewable energy tariffs are negotiated between PT PLN and the developer, and

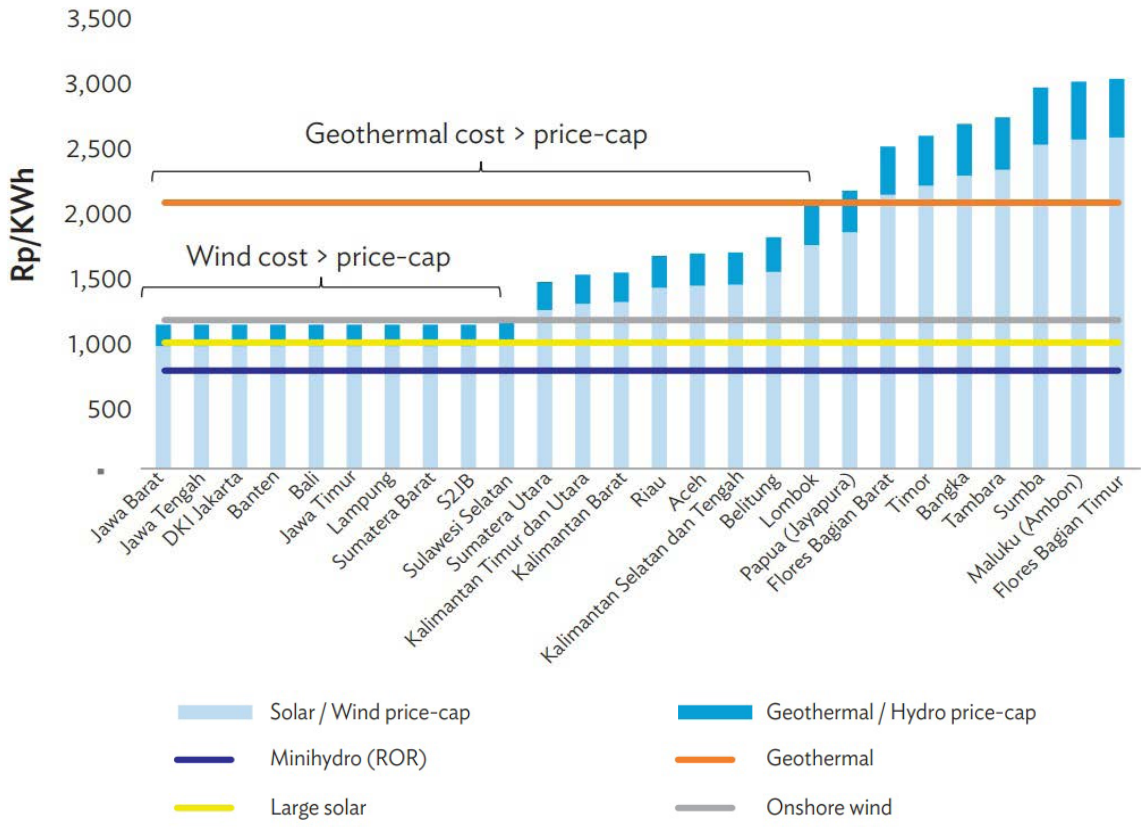
[4] Amended by 53/2018.

subsequently approved by the Ministry of Energy and Mineral Resources (MEMR) (possibly after one more round of negotiations with the Ministry) (MEMR, 2020).

If a project is located in an area where the regional generation production cost (*Biaya Pokok Produksi*, or BPP) is greater than the national average BPP, the negotiated tariff is not allowed to exceed 85% for wind and solar or 100% of the regional BPP for other technologies. However, the current pricing system has been reported to be unattractive for renewable energy developers; in addition, it undervalues the non-financial benefits of renewable energy generation (Asian Development Bank [ADB], 2020a).

A price–cost gap analysis by the ADB has illustrated that the feed-in tariff (FiT) levels for various technologies remain a significant barrier to the deployment of renewable energy in Indonesia. As seen in Figure 2, the price cap for wind and geothermal projects remains significantly lower in many areas compared to what it costs for developers to build, making them largely unattractive. For solar and small hydro, projects are often viable strictly on a BPP basis, but other non-financial barriers are not reflected in the price, including local content requirements, delays, or restrictions on foreign investors. This may lead to the need for subsidies to these technologies as well (ADB, 2020a).

Figure 2. Price–cost gap for selected renewable energy technologies



Source ADB, 2020a.

Since 2019, the government has taken steps to address the pricing concern through the drafting of a new presidential regulation that will set a new FiT for renewable energy projects. The new FiT establishes a minimum and maximum reference price for each energy type, where the first 10 years will provide a higher reference price than for subsequent years. (Setiawan, 2021).

According to MEMR, the reference price used in the regulation should be quite competitive against coal power plants, and it is thus expected to generate more interest in investing in renewable energy (Setiawan, 2021).

The draft is still undergoing review between the MEMR and the Ministry of Finance at the time of writing; however, it is clear that reinvesting fossil fuel subsidies from coal as well as the additional revenues from the coal tax to support a FiT for renewables would be an effective and necessary way to support renewable energy in Indonesia.

Land Acquisition and Infrastructure Barriers

Redirecting fiscal support for fossil fuels could also be used in Indonesia to overcome barriers around land acquisition. Historically, land acquisitions and related permitting have been a challenge that has played a significant role in adding risks and extra costs for renewable energy developers. In Indonesia, it's an issue as well in the sense that road infrastructure, land acquisition, and smaller-scale transmission lines all may fall under the developer's responsibility (Suharsono, 2020).

However, there are examples from other countries addressing these issues. For example, The Indian Government tried to address the issue by introducing the Solar Park Scheme, which required regional governments to provide the land needed for renewable energy projects, along with all the necessary statutory clearance and common infrastructure facilities. Through the Solar Park Scheme, the Indian government managed to go a long way in mitigating project costs related to uncertainties around land acquisition (Suharsono, 2020).

Indonesia could consider developing an Indian-inspired scheme to make investing in renewable projects more attractive by bringing down risks, accelerating project timeframes, and cutting down significantly the overall project cost in avoided infrastructure spending on the side of project developers.

Through the methods described in this brief, Indonesia could compensate for the lack of infrastructure finance via the existing Land Funding Scheme under the Ministry of Finance's State Assets Management Agency (LMAN). The LMAN scheme was established by the Ministry of Finance in 2016 and serves a special function as a land bank to provide land for infrastructure projects that are included in the National Strategic Projects (NSPs). This scheme was established to enforce the "zero idle assets" principle, primarily on national land, and helps fund land acquisition for infrastructure projects with money taken from the state budget (Kusdaryanto, 2018; Ministry of Finance, 2018).

So far, the LMAN scheme has been dedicated only to fund NSPs, which are projects that are considered to be strategically important to the national development agenda and have great urgency to be realized quickly. The projects can either be owned by the government, SOEs,

or private actors, as long as they meet the criteria set out in Presidential Regulation no. 58 of 2017 (Komite Percepatan Penyediaan Infrastruktur Prioritas, 2016).

Since its formation in 2016, the LMAN scheme has paid over IDR 80.2 trillion in land acquisition costs for NSPs, in which the largest component goes to toll roads (IDR 70.9 trillion). Examples of these funded projects are the Cisumdawu and Trans Sumatera Toll Roads, and Karian Dam. So far, however, no renewable energy projects have benefited from the scheme (Organisation for Economic Co-operation and Development, 2020). This could change with the Government of Indonesia's reforming the LMAN to better support clean energy projects. The reform could include selection criteria on renewable energy, and the money raised through reallocating fossil fuel subsidies and taxes could be allocated under the LMAN scheme, thereby supporting land acquisition costs dedicated to renewable energy projects.

Reallocation to a Greener PT PLN

Indonesia could also support a green recovery and transition by reallocating fossil fuel subsidies and fossil fuel taxes to back up PT PLN's plans for climate neutrality by 2060. The May 2021 announcement from PT PLN is an acknowledgement of the fact that the green energy transition is happening and that it will fundamentally change the operations of the company (Voice of Indonesia [VOI], 2021).

PT PLN is currently looking to invest heavily in grid improvement and expansions to ensure that they are prepared for a larger energy demand peak as well as a larger share of renewable energy in the grid (VOI, 2021).

According to the RUPTL 2021–2030, PT PLN plans to build an additional 34,500 kilometres of electricity transmission infrastructure, 209,400 kilometres of distribution network, and 45,500 megavolt amperes in total capacity of electricity substations by 2025 (PLN, 2021). Likewise, PT PLN is looking to improve existing distribution networks in order to address blackout and downtime issues, for example, by installing transformers, customer meters, and circuit breakers. In total, it is estimated that PT PLN's expenditures for distribution upgrades alone will be around USD 3 billion between 2021 and 2024 (ADB, 2020b).

As part of this plan, PT PLN has identified the establishment of smart grids as a key solution to increase reliability and efficiency in the grid. So far, 59 locations across the country have been identified for the implementation of smart grids. While the roadmaps for these are currently being developed, PT PLN recognizes that raising the financial resources needed will be a challenge (Dogaojo, 2020)—especially considering the fact that PT PLN is already struggling to cover its own operational costs (Cindy, 2020). During a hearing with the House of Representatives Commission VII in 2020, PT PLN stated a need for approximately IDR 400 trillion (USD 27.8 billion) of investment by 2024 to carry out its smart grid plans (Jakarta Post, 2020).

So far, the source of funds for transmission projects comes mostly from development partners. For example, PT PLN recently received a disbursement of 500 million euros from the French Development Agency to support energy transition (VOI, 2021). Another example is a USD

600 million loan from ADB to expand electricity access in the eastern part of Indonesia, which is the second phase of a PT PLN grid upgrade project that began in 2017.

Going forward, PT PLN will need significant amounts of investment to carry out its plans for smart grids as well as its broader efforts to become carbon neutral by 2060 (Jakarta Post, 2020).

While private investors are expected to play a part, the Government of Indonesia could reallocate fossil fuel subsidies and money raised from fossil fuel taxation to help scale this investment. Likewise, it would be an opportunity to send an important signal of support for PT PLN's plans, which could further help attract private capital and investors.

Reallocating to Ensure Reliable and Affordable Energy Access

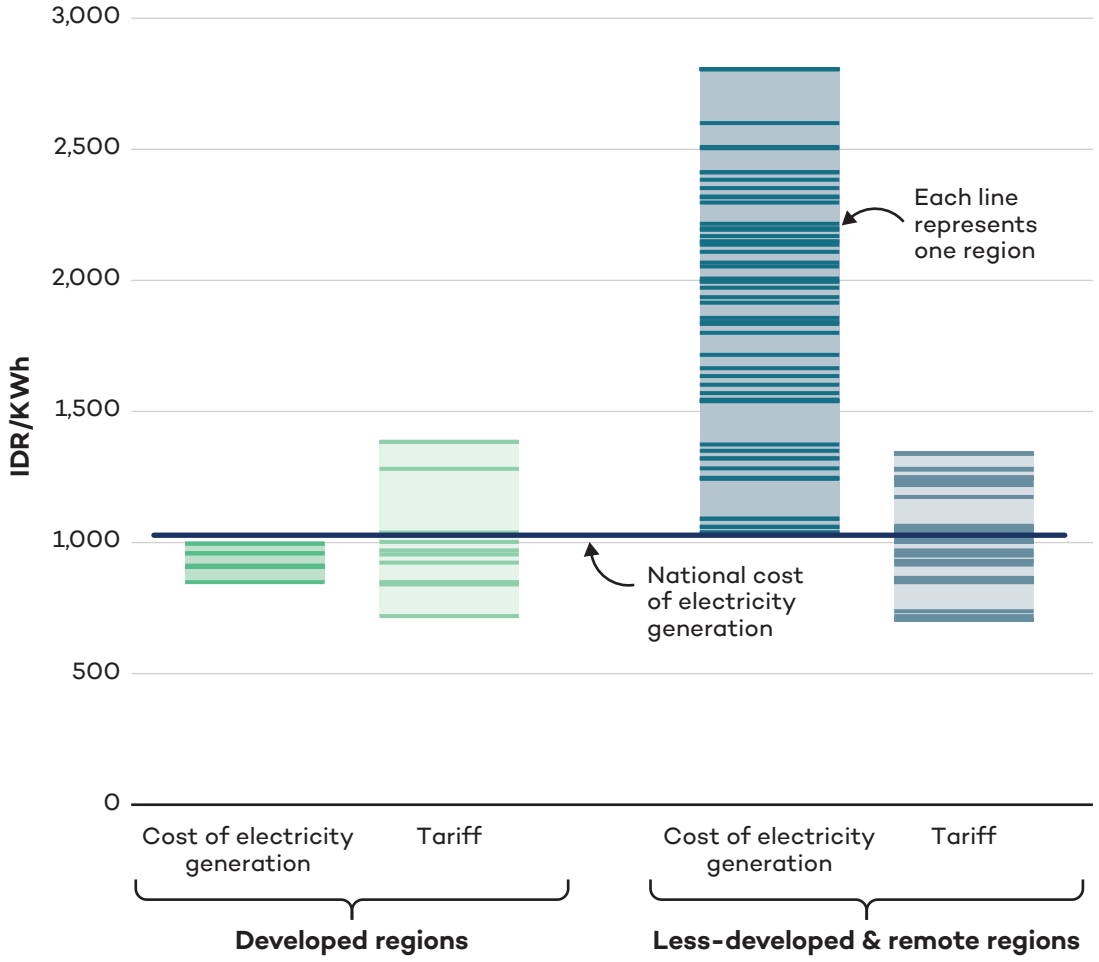
Energy access in Indonesia still represents a significant challenge. According to the World Bank, energy access is defined as access to a reliable source of energy at an affordable price (Bhatia et al., 2015). While Indonesia's electrification rate is close to 100%, there are still important reliability issues, and the cost of supplying electricity to remote areas from the centralized grid is above the national average. The reallocation of public funds from fossil fuels to decentralized solutions can improve the situation. Also, Indonesia presently holds the G20 Presidency, and securing energy access is one of its priorities as part of the "Energy Transitions Towards Sustainable Recovery and Productivity: Strengthen Global Cleaner Energy Systems and Just Transitions" theme (G20, 2022).

In 2021, Indonesia's overall electrification rate[5] reached 99.40%, with Eastern Indonesia still under 90% (Pribadi, 2021). However, currently, this does not mean 99.40% of the country's households are able to enjoy access to electricity 24/7 (Suryadi, 2020). In many parts of Indonesia, people only have access to electricity for 6 hours (CNNIndonesia, 2019), illustrating that Indonesia currently still does not provide reliable energy access to all.

The BPP in remote areas is also considerably above the national average. The latest data (2020) showed that the BPP in remotes areas ranged from IDR 1,038/kWh (USD 7.2 cents/kWh) to IDR 2,805.5/kWh (USD19.4 cents/kWh) , with an average of IDR 1910/kWh (USD 13.3 cents/kWh) (MEMR, 2021; PLN, 2021). These costs were above the national BPP (IDR 1,027.70/kWh or USD 7.05 cents/kWh). To mitigate the effects of higher production prices in these areas, electricity tariffs are kept artificially low in some regions (See Figure 3) through the provision of subsidies for electricity consumption. With 91% of Indonesia's grid electricity generated from fossil fuels (PLN, 2021), this means that subsidies are mostly going to fossil fuels and therefore also working against Indonesia's climate targets.

[5] The Ministry of Energy and Mineral Resources defines the electrification ratio as the ratio between electrified houses and the number of houses in Indonesia based on data from the Central Bureau of Statistics Indonesia.

Figure 3. BPP in all regions in Indonesia vs national BPP



Source: Authors' diagram based on data from MEMR, 2021 & PLN, 2021.

As an archipelagic country, Indonesia faces particular challenges in achieving universal energy access. So far, Indonesia's strategy has been to expand grid access to remote areas (Ravelo, 2019). However, Indonesia's geography with its many islands poses challenges for infrastructure development, increasing the cost of last-mile power connections (Asian Development Bank [ADB], 2016; Agung & Winarto, 2021; Lestari et al., 2018). Likewise, as an archipelago, it is likely that many islands and households will never be able to be connected to a large centralized grid due to geographical constraints, thus increasing the need for investing in other connection forms (Kempener et al., 2015).

Developing off-grid renewable energy solutions may help Indonesia achieve higher energy access in its remote areas. According to the International Renewable Energy Agency, mini-grids are particularly relevant for island states and a key driver for achieving higher energy access (Salgado et al., 2019). While efforts are already ongoing, they could be strengthened to lift even more people out of energy poverty. For example, PT PLN has initiated a "1,000 Islands Programme" that aims to install a total of 620 MW of solar photovoltaic on remote islands. Since the initiation of this program (2014), PT PLN had only reached 79 MW installed capacity by 2020 (RUPTL 2021–2030).

Indonesia could continue to develop its off-grid generation systems—where power generation is built near or in the areas where it will be used—for the residential sector and/or commercial sector in remote areas (Darghouth et al., 2020). These systems can provide a reliable energy supply to surrounding communities and improve their living standards (GlobalData Energy, 2020). One of the fundamental requirements for successfully deploying these systems is to formulate subsidy policies and/or affordability of electricity services, and to develop innovative, sustainable, and sufficient financing (Haanyika, 2006; Urmee et al., 2009). The ADB (2016) has suggested that the Government of Indonesia should establish annual availability of public funding to PT PLN and private renewable energy developers. According to the International Energy Agency (IEA), Indonesia will require investment of around USD 100 million annually from 2020 to 2030 to maintain the existing grid and support the expansion of decentralized solutions such as integrating renewable energy (IEA, 2020).

Indonesia can use the money raised from the reform of fossil fuel subsidies and taxing of fossil fuels to finance energy access initiatives on remote islands, for example, by boosting PT PLN's existing efforts under the "1,000 Islands Programme." This would first and foremost help Indonesia to increase energy access in remote areas but would also be aligned with Indonesia's priorities under its G20 Presidency.

Reallocation to Improve Energy Efficiency

Indonesia has a massive potential for improving energy efficiency. Energy efficiency is a critical sector to improve in order to meet energy-related climate targets.

IEA estimates that Indonesia is facing a 75% increase in energy demand by 2040, underlining the need for implementation of better energy efficiency measures. IEA (2020) further projects that demand growth could be limited to just 50% by reducing energy consumption from the buildings and industrial sectors as well as from transport. This would also reduce CO2 emissions by 120 Mt CO2 equivalent and save USD 7 billion in household energy bills (IEA, 2020). Likewise, the ADB suggests that Indonesia could reduce energy demand by between 10% and 35% through energy efficiency measures in the residential, municipal, industrial, and transportation sectors.

Unfortunately, the market for energy efficiency projects in Indonesia is not yet attractive for investment. Currently, the National Energy Plan aims to reduce primary energy intensity by 1% per year annually to 2025. Indonesia saw energy efficiency improvements of 8% between 2010 and 2018, with almost 90% coming from the industrial and service sectors (IEA, 2021). Likewise, energy efficiency standards for Indonesia's industrial sector are less ambitious than global ones. Thus, energy costs are taking up more than 50% of operational costs across the sector, with huge adverse impacts on competitiveness (Vitonia & Silitonga, 2021)—despite the fact that Indonesia has the second largest market potential for energy efficiency implementation in the Association of Southeast Asian Nations (ADB, 2020b).

Access to finance is a key barrier to energy efficiency in Indonesia. Despite their potential, energy efficiency projects in Indonesia are often deemed high risk and unprofitable by financial institutions due to their assumed long payback period and misperceptions regarding the technology's risk (Vitonia & Silitonga, 2021). Commercial building owners also currently

do not see energy efficiency projects as core business, and standard company investment guidelines, which usually require a high internal rate of return, make it hard to make energy efficiency projects viable (Asia-Pacific Economic Cooperation, 2017). In addition, there are insufficient guidelines and performance standards, making it hard to verify energy savings (ADB, 2020b).

These issues have led to a severe lack of bankable energy efficiency projects in the country, and there is a need to bridge the knowledge gap in order for Indonesia's energy service companies (ESCOs) to attract funding for energy efficiency projects. ESCOs in Indonesia are generally inexperienced and need greater awareness of energy efficiency measures, including the availability of finance. The Government of Indonesia could play a key role in fixing some of these issues by working closely with the ESCOs to create a market for energy efficiency. For example, this could be done through training and capacity building as well as through the identification of bankable projects or by providing guarantees for larger energy efficiency projects.

The government could make use of existing funding vehicles, such as the Indonesia Infrastructure Guarantee Fund, to incentivize and de-risk energy efficiency projects by using money raised from switching fossil fuel subsidies to support energy efficiency efforts. One example is providing guarantees for larger energy efficiency projects or by continuing and expanding efforts on light-emitting diode (LED)-based street lighting. These projects have previously been successfully implemented in Batang and Semarang, delivering energy and cost savings of up to 50% (ADB, 2020b).

This could help create a more attractive climate for energy efficiency finance and investments in order to support a nascent energy efficiency market in Indonesia.

Recommendations

As an emerging economy, Indonesia faces many challenges in achieving its renewable energy targets by 2025 as well as its climate targets by 2030. There are several ways, however, that Indonesia could use money redirected from fossil fuel subsidies and taxation to help achieve these targets. In this paper we have highlighted a number of interventions that the government could consider in order to tackle some of the barriers to renewable energy and energy efficiency measures that currently exist in Indonesia. Our recommendations include the following:

- Indonesia should start to actively promote renewable energy and energy efficiency measures by switching fossil fuel subsidies and revenues raised from fossil fuel taxation toward green energy. According to Sumarno and Sanchez (2021), up to IDR 166 trillion (USD 11.5 billion) could be raised annually by reforming subsidies to transport fuels and coal while at the same time implementing an additional but modest tax on these fuels. It's a significant amount that would equal 33% of the total estimated investment needed to reach Indonesia's target of having 23% new and renewable in the mix by 2025.

- Indonesia needs to invest heavily in renewable energy to achieve its climate targets. The Government of Indonesia should consider switching current expenditure on fossil fuels toward the removal of barriers to renewable energy across the country. This could include improving Indonesia's FiT regime or reducing the costs of land acquisition to attract more investments in renewable energy. It could also include supporting PT PLN in its plans for achieving climate neutrality by 2060, a target that will require substantial investments in power sector infrastructure.
- Energy efficiency can play a significant role for Indonesia in reducing energy demand and thereby helping to achieve its climate targets. However, the market for energy efficiency is still nascent. The Government of Indonesia could consider using money raised from fossil fuel subsidy reform and taxes to incentivize its energy efficiency market. This could be done, for example, through the training of energy service providers, better identification of bankable projects, by guarantees to de-risk larger energy efficiency projects, or by expanding existing LED street lighting projects.
- Energy access is still a challenge in parts of the country. Indonesia could consider using money raised from reforming fossil fuel subsidies and taxing fossil fuels to finance energy access initiatives. This could help Indonesia in achieving reliable and universal energy access on remote islands where power is currently intermittent. It would also fit well under the government's priorities for the G20 Presidency to be hosted in Bali later this year.

References

Agung, F., & Winarto, Y. (2021). Rasio Elektrifikasi butuh Rp 12 triliun, Kementrian ESDM dan PLN berharap pada PMN. Kontan.co.id.

Asian Development Bank. (2016). *Achieving universal electricity access in Indonesia*. https://www.adb.org/sites/default/files/publication/182314/achieving-electricity-access-ino.pdf

Asian Development Bank. (2020a). *Renewable energy tariffs and incentives in Indonesia: Review and recommendations.* https://doi.org/10.22617/TCS200254

Asian Development Bank. (2020b). *Indonesia energy sector assessment, strategy and road map—Update*. https://doi.org/10.22617/TCS200429

Asia-Pacific Economic Cooperation. (2017). *Energy efficiency finance in Indonesia: Current state, barriers and potential next steps*. https://www.apec.org/docs/default-source/Publications/2017/10/Energy-Efficiency-Finance-in-Indonesia-Current-State-Barriers-and-Potential-Next-Steps/217_EWG_APEC_Format_Incubator_EEFMapping_Indonesia_Report.pdf

Bhatia, M., Angelou, N., & Portale, E. (2015). *Beyond connections: Energy access redefined*. World Bank. https://openknowledge.worldbank.org/handle/10986/24368

Bridle, R., Gass, P., Halimajaya, A., Lontoh, L., McCulloch, N., Petrofsky, E., & Sanchez, L. (2018). *Missing the 23 per cent target: Roadblocks to the development of renewable energy in Indonesia*. International Institute for Sustainable Development. https://www.iisd.org/sites/default/files/publications/roadblocks-indonesia-renewable-energy.pdf

Cindy, M. A. (2020, September 29). *Good news is a bad news: Indonesia's electricity subsidy.* The Purnomo Yusgiantoro Center. https://www.purnomoyusgiantorocenter.org/good-news-is-a-bad-news-indonesias-electricity-subsidy/

CNNIndonesia. (2019). *Ironi Elektrifikasi 99 Persen, Listrik Nyala Tak Lebih 6 Jam*. https://www.cnnindonesia.com/ekonomi/20191027181730-85-443290/ironi-elektrifikasi-99-persen-listrik-nyala-tak-lebih-6-jam

Danish Energy Agency and Ministry of Energy and Mineral Resources. (2021). *Renewable energy pipeline*. https://ens.dk/sites/ens.dk/files/Globalcooperation/renewable_energy_pipeline.pdf

Darghouth, N., Mccall, J., Keyser, D., & Aznar, A. (2020). *Distributed photovoltaic economic impact analysis in Indonesia*. https://www.nrel.gov/docs/fy20osti/75281.pdf

Dogaojo, J. (2020, September 14). *How does PLN successfully transition to smart grid & 4.0 technologies*. Enlit Asia. https://www.enlit-asia.com/grids/how-does-pln-successfully-transition-to-smart-grid-4-0-technologies/

Dewan Energi Nasional (2021). *Synergizing oil and gas sectors & RE in competitiveness towards the energy transition*. http://www.den.go.idG20. (2022). Indonesian G20 Presidency. https://g20.org

GlobalData Energy. (2020). *A golden opportunity for distributed power generation amid Covid-19 to enhance grid resilience and reliability issues*. https://www.power-technology.com/comment/distributed-power-generation/

Haanyika, C. M. (2006). Rural electrification policy and institutional linkages. *Energy Policy, 34*(17), 2977–2993. https://doi.org/10.1016/j.enpol.2005.05.008

Indrawan, R. (2021). *Penggunaan Energi Fosil Meningkat, Bauran EBT Turun Jadi 10,9%*. DuniaEnergi. https://www.dunia-energi.com/penggunaan-energi-fosil-meningkat-bauran-ebt-turun-jadi-109/

International Energy Agency. (2020). *Attracting private investment to fund sustainable recoveries: The case of Indonesia's power sector*. International Energy Agency. https://www.iea.org/reports/attracting-private-investment-to-fund-sustainable-recoveries-the-case-of-indonesias-power-sector

Jakarta Post. (2020). *PLN allocates Rp 90 trillion to build electricity infrastructure this year*. https://www.thejakartapost.com/news/2020/03/04/pln-allocates-rp-90-trillion-to-build-electricity-infrastructure-this-year.html

Jokowi introduces expansive 2022 budget bill, promises reform to overcome prolonged pandemic, uneven global recovery. (2021). *Jakarta Globe*. https://jakartaglobe.id/business/jokowi-introduces-expansive-2022-budget-bill-promises-reform-to-overcome-prolonged-pandemic-uneven-global-recovery

Kempener, R., Lavagne, O., Saygin, D., Skeer, J., Vinci, S., & Gielen, D. (2015). *Off-Grid Renewable Energy Systems: Status and Methodological Issues*. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA_Off-grid_Renewable_Systems_WP_2015.pdf

Komite Percepatan Penyediaan Infrastruktur Prioritas. (2016). *National strategic projects*. https://kppip.go.id/en/national-strategic-projects/

Kusdaryanto, P. P. (2018). Managing the state assets: A comparative study of Indonesia and Japan. Ministry of Finance.

Laan, T., Suharsono, A., & Viswanatha, B. (2021). Fuelling the recovery: How India's path from fuel subsidies to taxes can help Indonesia. International Institute for Sustainable Development. https://www.iisd.org/publications/fuelling-recovery-india-subsidies-help-indonesia

Lestari, H., Arentsen, M., Bressers, H., Gunawan, B., Iskandar, J., & Parikesit. (2018). Sustainability of renewable off-grid technology for rural electrification: A comparative study using the IAD framework. *Sustainability (Switzerland), 10*(12). https://doi.org/10.3390/su10124512

Pradiptyo, R., Susamto, A., Wirotomo, A., Adisasmita, A., & Beaton, C. (2016). *Financing development with fossil fuel subsidies: The reallocation of Indonesia's gasoline and diesel subsidies in 2015*. International Institute for Sustainable Development. https://www.iisd.org/system/files/2020-08/financing-development-with-fossil-fuel-subsidies-indonesia.pdf

Pribadi, A. (2021). Triwulan III 2021: Rasio Elektrifikasi 99,40%, Kapasitas Pembangkit EBT 386 MW. Ministry of Energy and Mineral Resources. https://www.esdm.go.id/id/media-center/arsip-berita/triwulan-iii-2021-rasio-elektrifikasi-9940-kapasitas-pembangkit-ebt-386-mw

Mediatama, G. (2021, October 23). *PLN: Kebutuhan investasi untuk kebutuhan listrik hingga 2060 capai Rp 9.000 triliun*. PT. Kontan Grahanusa Mediatama. https://newssetup.kontan.co.id/news/pln-kebutuhan-investasi-untuk-kebutuhan-listrik-hingga-2060-capai-rp-9000-triliun

Ministry of Energy and Mineral Resources. (2020). *Permen ESDM Nomor 4 Tahun 2020*. https://jdih.esdm.go.id/storage/document/Permen%20ESDM%20Nomor%204%20Tahun%202020.pdf

Ministry of Finance. (2018). *Managing the state assets: A comparative study of Indonesia and Japan*. https://www.djkn.kemenkeu.go.id/kpknl-parepare/baca-artikel/12686/Managing-the-State-Assets-A-Comparative-Study-of-Indonesia-and-Japan.html

Organisation for Economic Co-operation and Development. (2020). *OECD clean energy finance and investment policy review: Indonesia*. https://www.oecd.org/environment/cc/policy-highlights-clean-energy-finance-and-investment-policy-review-of-indonesia.pdf

Perusahaan Listrik Negara. (2021). *RUPTL PLN 2021–2030*. https://web.pln.co.id/statics/uploads/2021/10/ruptl-2021-2030.pdf

Ravelo, J. L. (2019). *Indonesia expands the grid to remote islands, but what about its climate goals?* https://www.devex.com/news/indonesia-expands-the-grid-to-remote-islands-but-what-about-its-climate-goals-95482

Republic of Indonesia. (2021, June 22). *Updated NDC Indonesia 2021*. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Indonesia%20First/Updated%20NDC%20Indonesia%202021%20-%20corrected%20version.pdf

Salgado, A., Boshell, F., Anisie, A., & Litman-Roventa, N. (2019). *Innovation landscape brief: Renewable mini-grids*. International Renewable Energy Agency. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Sep/IRENA_Renewable_mini-grids_2019.pdf

Sanchez, L., Bridle, R., Corkal, V., Gass, P., Geddes, A., Gerasimchuk, I., Kuehl, J., Laan, T., Moerenhout, T., Muttitt, G., Muzondo, C., Pant, A., Roth, J., Sharma, S., Viswamohanan, A., & Viswanathan, B. (2021). *Achieving a fossil-free recovery*. International Institute for Sustainable Development. https://www.iisd.org/publications/achieving-fossil-free-recovery

Setiawan, V. N. (2021, September 30). *Rancangan Perpres EBT Rampung, Begini Rincian Harga Jual Listrik EBT*. Energi Baru Katadata.co.id. https://katadata.co.id/happyfajrian/ekonomi-hijau/61554a9bd37ab/rancangan-perpres-ebt-rampung-begini-rincian-harga-jual-listrik-ebt

Suharsono, A. (2020). *Achieving low solar energy price in Indonesia: Lessons learned from the Gulf Cooperation Council region and India*. International Institute for Sustainable Development. https://www.iisd.org/publications/solar-energy-price-indonesia

Sumarno, T. B., & Laan, T. (2021). *Taxing coal to hit the goals: A simple way for Indonesia to reduce carbon emissions.* International Institute for Sustainable Development https://www.iisd.org/system/files/2021-08/taxing-coal-indonesia-reduce-carbon-emissions.pdf

Sumarno, T. B., & Sanchez, L. (2021). *How Indonesia can achieve both a COVID-19 recovery and its climate targets*. International Institute for Sustainable Development. https://www.iisd.org/publications/indonesia-achieve-covid-19-recovery-and-climate-targets

Suryadi, B. (2020). Indonesia's power goals: What's next after universal electrification. Energy for Growth Hub. https://www.energyforgrowth.org/memo/indonesias-power-goals-whats-next-after-universal-electrification/

Umah, A. (2020). *RI Butuh Rp 423 T Biar Capai Target Energi Terbarukan di 2025*. CNBC Indonesia. https://www.cnbcindonesia.com/news/20201130105914-4-205612/ri-butuh-rp-423-t-biar-capai-target-energi-terbarukan-di-2025

Urmee, T., Harries, D., & Schlapfer, A. (2009). Issues related to rural electrification using renewable energy in developing countries of Asia and Pacific. *Renewable Energy, 34*(2), 354–357. https://doi.org/10.1016/j.renene.2008.05.004

Vitonia, D., & Silitonga, R. J. P. (2021). *Review of policies and measures for energy efficiency in Indonesia's industrial sector*. https://aseanenergy.org/review-of-policies-and-measures-for-energy-efficiency-in-indonesias-industrial-sector/

Voice of Indonesia. (2021). *PLN receives Rp8.09 trillion of funds from France for energy transition*. Waktunya Merevolusi Pemberitaan. https://voi.id/en/economy/108204/pln-receives-rp809-trillion-of-funds-from-france-for-energy-transition

INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT

The International Institute for Sustainable Development (IISD) is an award-winning independent think tank working to accelerate solutions for a stable climate, sustainable resource management, and fair economies. Our work inspires better decisions and sparks meaningful action to help people and the planet thrive. We shine a light on what can be achieved when governments, businesses, non-profits, and communities come together. IISD's staff of more than 120 people, plus over 150 associates and consultants, come from across the globe and from many disciplines. With offices in Winnipeg, Geneva, Ottawa, and Toronto, our work affects lives in nearly 100 countries.

IISD is a registered charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Province of Manitoba and project funding from governments inside and outside Canada, United Nations agencies, foundations, the private sector, and individuals.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org
Twitter: @IISD_news

IISD

Global Subsidies Initiative