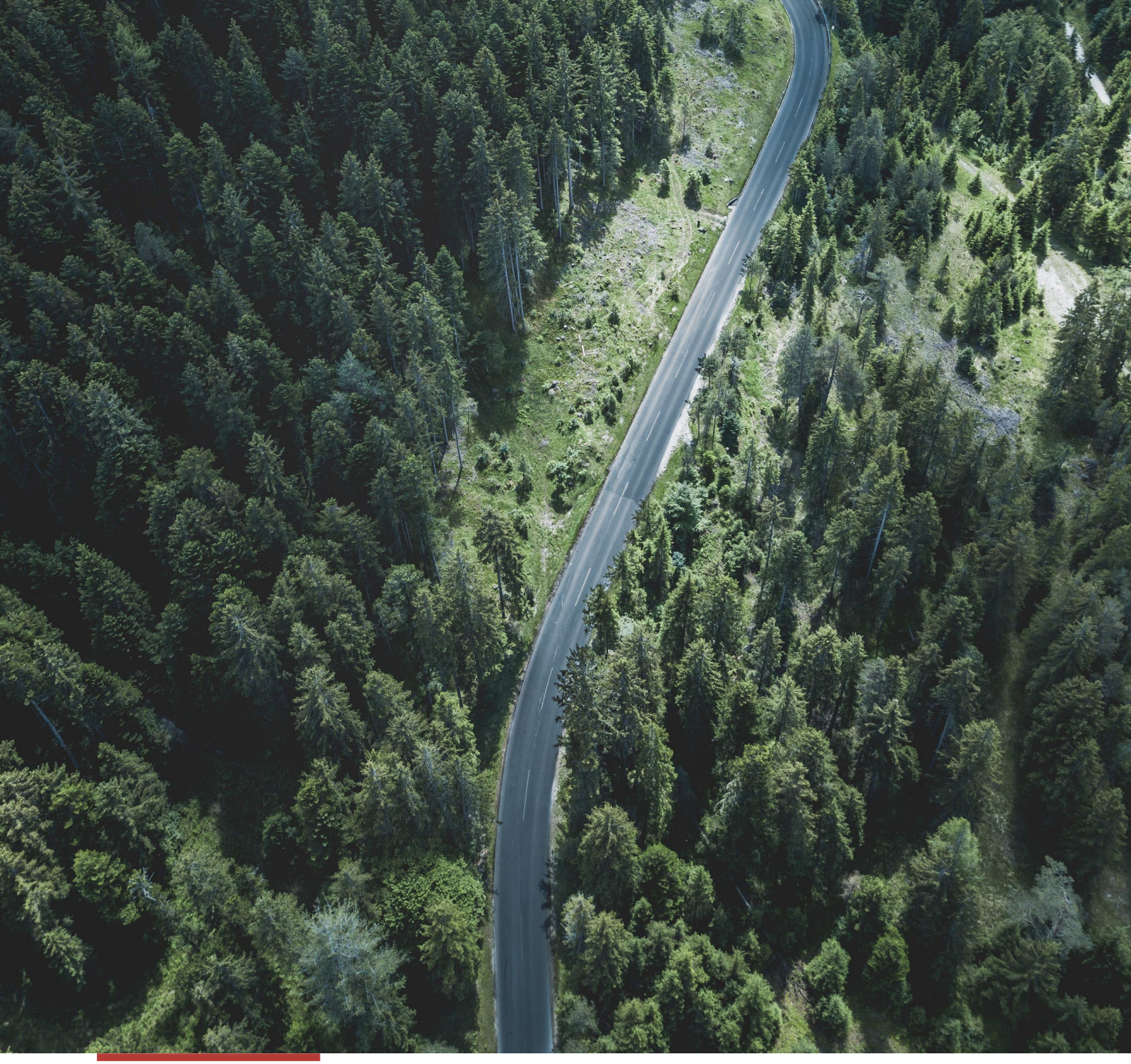

Leveraging fiscal stimulus to improve energy transition: Case of South Korea and Indonesia

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CPI is an analysis and advisory organization with deep expertise in finance and policy. Our mission is to help governments, businesses, and financial institutions drive economic growth while addressing climate change. CPI has six offices around the world in Brazil, India, Indonesia, Kenya, the United Kingdom, and the United States.

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DESCRIPTORS

SECTOR
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EXECUTIVE SUMMARY

Strict lockdowns across the globe in response to the COVID-19 crisis have led to severe economic consequences. Compared to 2019, the global GDP in 2020 fell by 4.3 %, the most severe decline since 1960 – exceeding the 0.1% drop which followed the global financial crisis in 2009 (World Bank, 2021).

While early responses to the pandemic were focused on rescue efforts, governments are now transitioning into economic recovery efforts. The two countries analyzed in this report – South Korea and Indonesia – announced stimulus packages of USD 333.7 billion and USD 74.7 billion, respectively (Climate Policy Initiative, 2021).

This study, produced in collaboration with the Seoul National University, aims to analyze the COVID-19 recovery policies in South Korea and Indonesia, particularly the role of fiscal stimulus in their energy transition goals. Both countries are actively trying to increase the share of renewable energy in their energy mix. Given the similarities in the energy supply mix and the energy market structure, this study will also explore the relationship between newly developed energy and fiscal stimulus policies and clean energy transition. It will further delve into the impact of crisis-induced fiscal spending on the trajectory of energy transition development in both countries.

This analysis is an extension to the study "Improving the impact of fiscal stimulus in Asia: An analysis of green recovery investments and opportunities" which measures the 'greenness' of the COVID-19 recovery packages and their contribution towards country-level climate objectives in five Asian countries.

Despite the difference in the level of electricity consumption in both countries – South Korea's electricity consumption in 2019 was 10,192 kWh per capita, compared to Indonesia's 972 kWh per capita – the problems faced by the energy sectors are somewhat similar. **For many years, energy policies in both countries were focused on an affordable and stable supply of power to boost economic growth.** As a result, the energy mix in power generation became heavily dependent on fossil fuels. **However, now there is a political will to accelerate the transition to renewable energy, and both countries aim to boost renewables and reduce carbon emissions significantly.** South Korea plans to increase its share of renewable electricity production to 20% by 2030 and 30-35% by 2040. Meanwhile, Indonesia aims to meet a 23% national renewable energy target by 2025. Crisis policies should ideally be in line with and support these targets.

Table ES1: Electricity supply mix in South Korea and Indonesia by 2019

Electricity Supply Mix	South Korea	Indonesia
Coal	40%	51%
Natural Gas	26%	29%
Nuclear	26%	N/A
Renewable Energy	7%	14%
Oil	N/A	7%

KEY FINDINGS

1. **The impact of COVID-19 on the energy sectors of both countries is quite similar: In the first half of 2020, electricity consumption in both South Korea and Indonesia dropped by -2.8% and -7.06% respectively, compared to 2019.**

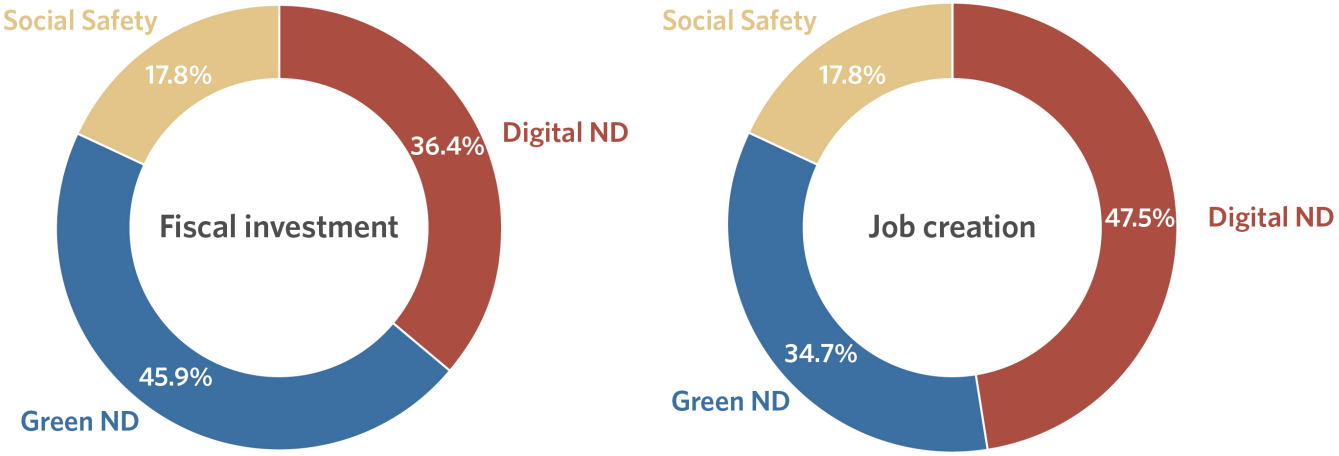
   From January to July 2020, South Korea saw a decline of -2.8% in electricity consumption compared to 2019. This decline mainly came from the industrial (-5.1%) and commercial (-1.7%) sectors and reflects an immediate response to the COVID-19 containment measures like lockdowns and an aggressive push for work/school from home. Similarly in Indonesia, from January to June 2020, electricity consumption fell by -7.06% which was again due to the industrial (-19.2%) and commercial (-18.7%) sectors. Energy consumption in the industrial and commercial sectors is expected to go back to business-as-usual once the pandemic is under control in both countries.

   On the contrary, residential electricity demand increased significantly by 5.5% in South Korea and 10% in Indonesia, primarily due to restrictions that required people to stay at home for long hours.

2. **The primary focus of fiscal stimulus in response to the COVID-19 crisis in South Korea and Indonesia has been to address health emergencies and to provide support to vulnerable households and businesses for survival. At the same time, South Korea managed to seize the opportunity by using the economic recovery momentum to address climate and environmental challenges.**

   As of July 2020, the South Korean government has announced fiscal stimulus packages amounting to USD 238 billion (277 trillion KRW). It includes the South Korean New Deal (KND) equaling USD 137 billion (KRW 160 trillion) which aims to strengthen the economy by creating close to 1.9 million jobs. In addition to the stimulus packages, the South Korean government introduced the Green New Deal (GND). The policies and projects proposed under the GND can be largely grouped into three categories: (1) transitioning buildings and infrastructure into green, (2) expansion of low-carbon and distributed energy, and (3) green industrial innovation. South Korea shows that it is possible to address both economic and climate concerns through fiscal stimulus packages. The GND, along with other recent developments, signifies a positive change of political commitment and a promising opportunity to leverage large-scale public investments for reaching long-term, sustainable growth goals.

Figure ES1: South Korean New Deal and Job creation plan by 2025



Total	B = 137 (160.0) E = 98 (114.1)
Digital new deal	B = 90 (58.2) E = 38.5 (44.8)
Green new deal	B = 65 (73.4) E = 36.3 (42.7)
Social safety	B = 24 (28.4) E = 22.9 (26.6)

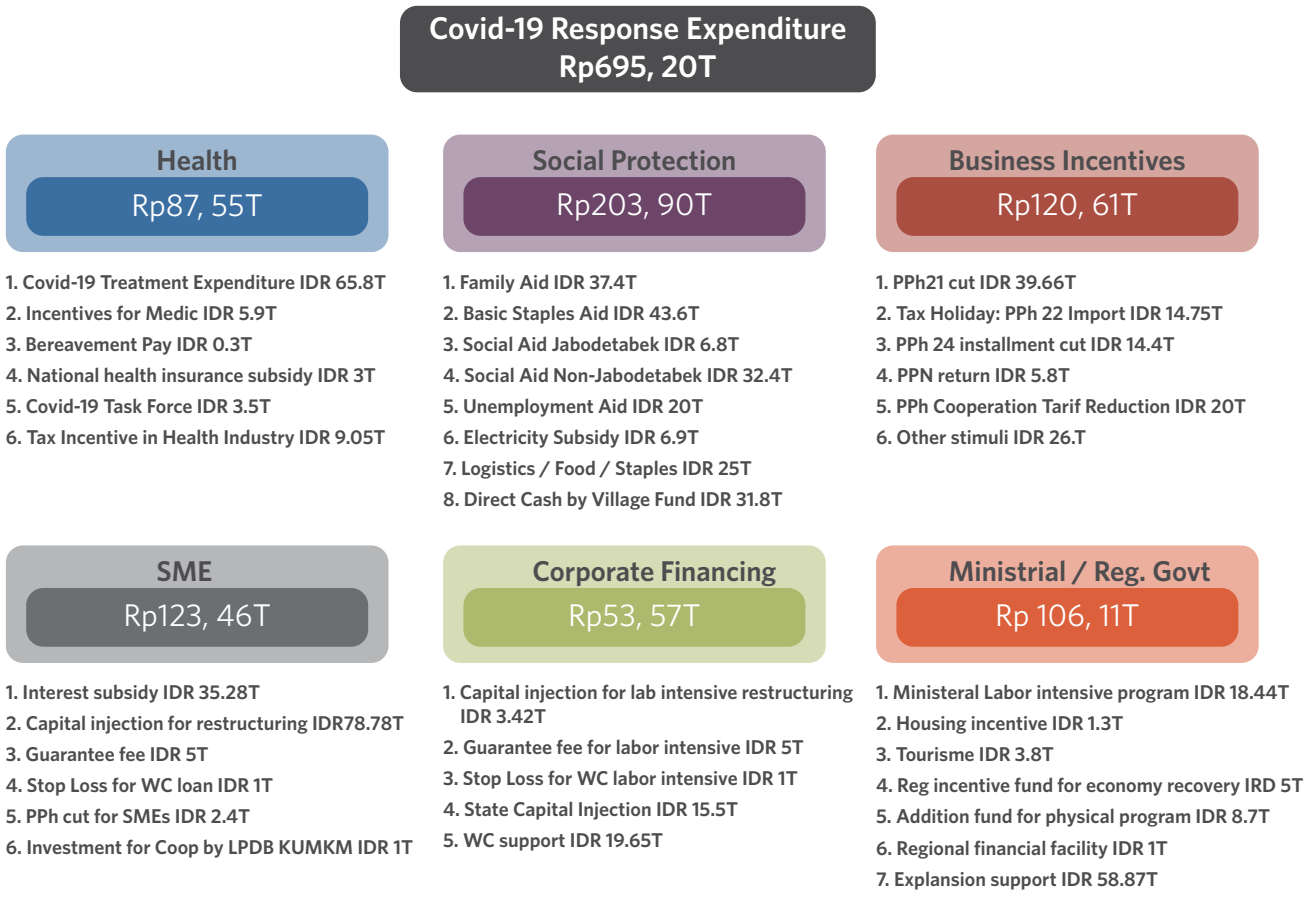
Total	190.1
Digital new deal	90.3
Green new deal	65.9
Social safety	33.9

B = total required budget, E = government expenditure

Unit: Billion USD (trillion KRW), ten thousand jobs

On the other hand, the Indonesian government issued a fiscal stimulus package, known as the National Economic Recovery or Pemulihan Ekonomi Nasional (PEN) program, which sets out stimulus policies to soften the economic impact caused by the pandemic. PEN allocates USD 49 billion (IDR 695.2 trillion) to focus on social protection and fiscal incentives for businesses in different sectors. Allocations related to energy transition represent only 0.9% of the total PEN budget. In other words, Indonesia's PEN does not focus on green recovery specifically. The Indonesia Planning and Development Agency (Bappenas) published recommendations to Build Forward Better, which includes the importance of clean energy for short-term and long-term economic benefits as well as better job creation than conventional energy (Badan Perencanaan Pembangunan Nasional, 2020), but these have not yet materialized into fiscal stimulus action. Overall, Indonesia's fiscal stimulus has the potential for improvements that would support energy transition while still addressing short-term economic recovery.

Figure ES2: Breakdown of Indonesia's PEN in 2020



3. **South Korea's Green New Deal (GND) and Indonesia's National Economic Recovery (PEN) program both provide new impetus to the environmental and climate sectors. However, structural challenges and short-term policies jeopardize long-term sustainability.**

   The current energy structure and market are one of the key barriers to renewable energy transition in South Korea. Unfavorable market policies and practices have made the energy sector unattractive to private investors, which is of considerable concern considering 42% of the GND is dependent on mobilizing private investments. Therefore, policy adjustments, discussed in this report, will likely be required to ensure an increase in active participation from various private actors and prosumers).

   Undeniably, the introduction of the GND is a welcome step, but it is not without shortfalls. The deal primarily emphasizes fiscal investments and job creation, but fails to include specific targets, timelines, and plans to reduce emissions and stimulate economic recovery. By comparison, the European Green New Deal proposes new legislation that stipulates emissions reduction targets, and a revision of existing policies with more detailed plans for measurement and monitoring.

   On the other hand, Indonesia's PEN is fully financed by public fiscal spending but has addressed some potential barriers for private investment in renewable energy through financing and subsidy for small and medium enterprises (SMEs). This can

lower the barriers to high financing costs for renewable energy development. PEN's direct electricity subsidy to consumers should help stabilize electricity consumption levels, which in turn will help ensure demand for renewable energy is relatively steady. However, given that allocations related to energy transition covers only 0.9% of total PEN, few barriers to private investment in clean energy can be addressed. The 2021 fiscal stimulus does not provide much comfort either, as the budget for business and tax incentive programs has declined by 15.7%, and these programs received the smallest portion with an allocation of USD 2.89 billion (IDR 47.27 trillion). This may not be helpful for small renewable energy businesses and services that still struggle with cashflow and require greater fiscal incentives to bounce back.

In conclusion, PEN is designed to address only the short-term COVID-19 impacts and is not adequate for long-term sustainability. It also fails to explicitly mention green recovery or jobs creation targets.

RECOMMENDATIONS

Based on our research, we recommend the following focused interventions to ensure a sustainable economic recovery and accelerate the energy transition agenda in South Korea and Indonesia:

1. Stimulus spending offers a window of opportunity for both nations to support short-term economic growth while addressing longer-term climate, sustainability, and economic inclusion goals. South Korea is already on this path, but adjustments proposed in this report could increase the power of the proposed government spending by removing barriers and creating more incentives that would attract private investment. Learning from South Korea's GND, Indonesia needs to take advantage of the economic recovery momentum to boost the long-term energy transition agenda by formalizing green recovery aspects and making green job creation more explicit within the PEN framework.
2. To further ensure public spending is efficiently applied towards longer-term sustainability goals, South Korea and Indonesia's fiscal stimulus need to include specific targets, timelines, sectoral pathways and plans to reduce emissions and stimulate economic recovery. A toolbox of policies and measures, such as reallocating subsidies to support solar PV adoption in Indonesia and revising relevant laws in South Korea to allow companies to enter into power purchase agreements with renewables providers as discussed in this report, are required to better address both short-term incentives and long-term structural changes.
3. Specific attention needs to be given to create enabling environments that attract private investment in the green transition plan, while relieving the pressure on public spending. For South Korea, market policies and practices need to be reformed, while for Indonesia, better fiscal policies are needed, to address long-term investment barriers and attract private investment in both countries.

CONTENTS

1. INTRODUCTION

As a result of the COVID-19 crisis, the world is seeing a -2-4% decline in Gross Domestic Product (GDP), with developing economies bracing for the deepest declines (Maliszewska et al., 2020). This unprecedented shock has forced countries to disburse fiscal stimulus to help mitigate the crisis. The latest research shows that the size of stimulus from 30 countries[1] has reached USD 14.9 trillion, of which only USD 1.8 trillion (19%) flows into green sectors (Vivid Economics, 2021). In other words, while countries laser-focus their fiscal spending to aid the health and economic effects of COVID-19, they are also prone to jeopardize the prospect of a resilient and sustainable future.

Climate goals should underpin the framework of COVID-19 recovery, as ecological deterioration is associated with an increased risk of zoonotic diseases (UNEP, 2019) similar to COVID-19.

The current pandemic may provide the momentum to further transition the global economy towards low carbon. Government stimulus, or public finance, should be used to leverage private climate finance in the long run.

Directing government stimulus in support of climate goals is not only beneficial in the long run but also the short and medium-term. While ensuring that all social and healthcare needs are addressed immediately, focusing stimulus on climate goals can generate immediate green jobs, while reducing the medium-term debt burdens, and support long-term growth and resilience.

Asian countries, like their counterparts around the world, are using fiscal stimulus to respond to COVID-19. South Korea and Indonesia have both experienced a recession in 2020.

In this study, we focus on South Korea and Indonesia and aim to analyze the COVID-19 recovery policies in each country, particularly the role of fiscal stimulus in their energy transition goals.

Since the outbreak of COVID-19, the South Korean government has aggressively introduced fiscal stimuli with policy packages amounting to a total of USD 241 billion (KRW 277 trillion). While most of the budget has been allocated towards strengthening social security and the economy, and providing support for individuals and businesses through both direct and indirect fiscal support, a portion, albeit smaller, has been directed towards a green and digital transition of the economy and society.

On the other hand, Indonesia has reallocated its fiscal budget amounting to USD 49 billion (IDR 695.2 trillion) for healthcare, social assistance, and small businesses. Indonesia has also widened its debt-to-GDP ratio to more than 3% until 2023 (Government of Indonesia

1 Australia, Canada, France, Germany, Italy, Japan, South Korea, Spain, United Kingdom, United States, Colombia, Turkey, Switzerland, Brazil, China, India, Indonesia, Mexico, Russia, and South Africa

regulation, 2020) to stimulate economic recovery and support the achievement of development targets while maintaining sustainable fiscal management.

New policies have been issued in both countries to counter the negative impact of the COVID-19 pandemic, but there is no previous analysis on the impact of fiscal stimulus on climate goals.

Without adequate knowledge of the trajectory of fiscal stimulus spending, estimating the trajectory of climate actions, such as clean energy transition, would result in an inaccurate estimate. For many years, energy policies in both countries focused on the affordable and stable supply of power to support economic growth. As a result, the energy mix in power generation is heavily driven by fossil fuels.

With similarities in terms of energy supply mix and energy market structure in both countries, through this study, we intend to understand the relationship between South Korea and Indonesia's fiscal recovery spending versus the trajectory of energy transition development. The report is structured as follows: In chapter 2, we focus on South Korea, and in chapter 3, we focus on Indonesia as a case study. Both chapters provide an overview of the electricity demand and supply before and during COVID-19, fiscal stimulus packages to aid economic recovery, and opportunities and challenges in renewable energy development. In chapter 4, we conclude with recommending focused policy interventions to accelerate both, economic recovery, and energy transition.

2. CASE STUDY: SOUTH KOREA

In this section, we outline the impact of COVID-19 fiscal stimulus on South Korea's energy transition policies. We start by assessing the electricity demand and supply prior to and during the pandemic in 2020. We then evaluate the momentum created by COVID-19, its effects on the pathway towards sustainable energy supply, and any consumer behavior changes that occurred as a result of the pandemic.

We then delve further into South Korea's green new deal, a USD 252 billion fiscal stimulus package, which aims to stimulate green recovery in the country. We particularly focuses on whether the deal has the potential to affect the nation's energy transition agenda.

Lastly, we analyze the barriers to South Korea's clean energy transition, evaluate available opportunities, and provide policy recommendations for the South Korean government to accelerate clean energy transition in the country.

2.1 ELECTRICITY DEMAND AND SUPPLY BEFORE AND DURING COVID-19 IN SOUTH KOREA

In the past, South Korea's energy policies were directed towards maintaining an affordable and stable supply of power to support economic growth driven by the nation's manufacturing industry.

Therefore, the key focus dwelt on energy security and increasing supply by constructing additional power plants.

This strategy caused South Korea's position to rise as high as the 7th largest carbon emitter in the world in 2010. Most recently, in 2019, the country's rank dropped to the 9th position with annual emissions amounting to 611 $MtCO_2e$ (Global Carbon Atlas, 2020).

In response to this statistic, South Korea's intended nationally determined contribution (INDC) aims to reduce greenhouse gas (GHG) emissions by 37% compared to the business-as-usual trajectory (BAU, 850.6 $MtCO_2e$) across all economic sectors.

The 2030 basic roadmap for national GHG emissions reductions (2018, revised) and 2nd basic plan on climate change response (2019) provide specific mitigation targets for each sector as summarized in Table 2.1.

In addition to these reduction targets for various sectors, both plans also include reduction targets through the use of carbon capture, utilization and storage (CCUS) technology, which is expected to lessen a further 10.3 $MtCO_2e$.

The nation's planned usage of forests as CO_2 absorbents, while looking for other solutions overseas to handle the residual carbon emissions, will amount to 38.3 $MtCO_2e$.

Table 2.1: Emissions reduction targets

Sector	Estimated Emission Amount	Estimated Emission Amount After Mitigation	Mitigation Amount (Mitigation Percentage)
Transition	333.2	192.7	140.5 (42.2%)
Industry	481	382.4	98.5 (20.5%)
Building (Residential·Commercial)	197.2	132.7	64.5 (32.7%)
Transport	105.2	74.4	30.8 (29.3%)
Waste	15.5	11.0	4.5 (28.9%)
Public·Other	21.0	15.7	5.3 (25.3%)
Agriculture and Stock Raising (Non-Energy)	20.7	19.0	1.6 (7.9%)

*Estimated year is 2030 and measurements are in MtCO2e.

Source: Joint Ministry of South Korean Government

2.1.1 TARGETS AND POLICIES FOR THE ELECTRICITY SECTOR

As shown in the targets, transition can be considered to be the most significant aspect as both absolute mitigation amount (140.5 MtCO2e) and mitigation percentage (42.2%) are at the highest. The electricity sector is the primary focus of transition and, for this reason, will also be the focus of this report.

Meanwhile, policies and interventions must be put in place for both supply and demand to meet the targets. For the supply-side, the government plans to implement a more decentralized system, by reducing the share of electricity generation from centralized energy sources such as coal and nuclear. Instead, it will increase the capacity of more decentralized sources such as renewables.

On the demand-side, measures to increase energy efficiency and manage demand were considered. These trends are represented in the 8th basic plan on electricity demand and supply issued in 2017, as well as the 3rd energy master plan issued in 2019.

According to these plans, the government aims to increase the share of renewable electricity production to 20% by 2030, and to 30-35% by 2040. It also plans to shut down old coal-based power plants or change them to cleaner fuel such as LNG, while prohibiting the construction of new power plants.

As for energy demand, the government intends to stabilize increases in annual electricity consumption to 1.0% on average from 2017 to 2031, and improve energy efficiency by 38% compared to 2017. It also aims to reduce demand by 18.6% compared to its BAU trajectory in 2040.

Nuclear phase-out is also a significant trend in South Korea's current energy policies, as shown in the roadmap for nuclear phase-out in 2017. According to this roadmap, the government intends to reduce the number of government power plants to 14 by 2038 by canceling all planned construction of new power plants. It will also gradually shutdown old plants that may have safety issues.

Such reductions are reflected in both national plans on energy. These note the reduction in nuclear generating capacity from 22.5GW (2017) to 20.4GW (2030) with no renewal of the life-capacity of old reactors, and no construction plans for new ones.

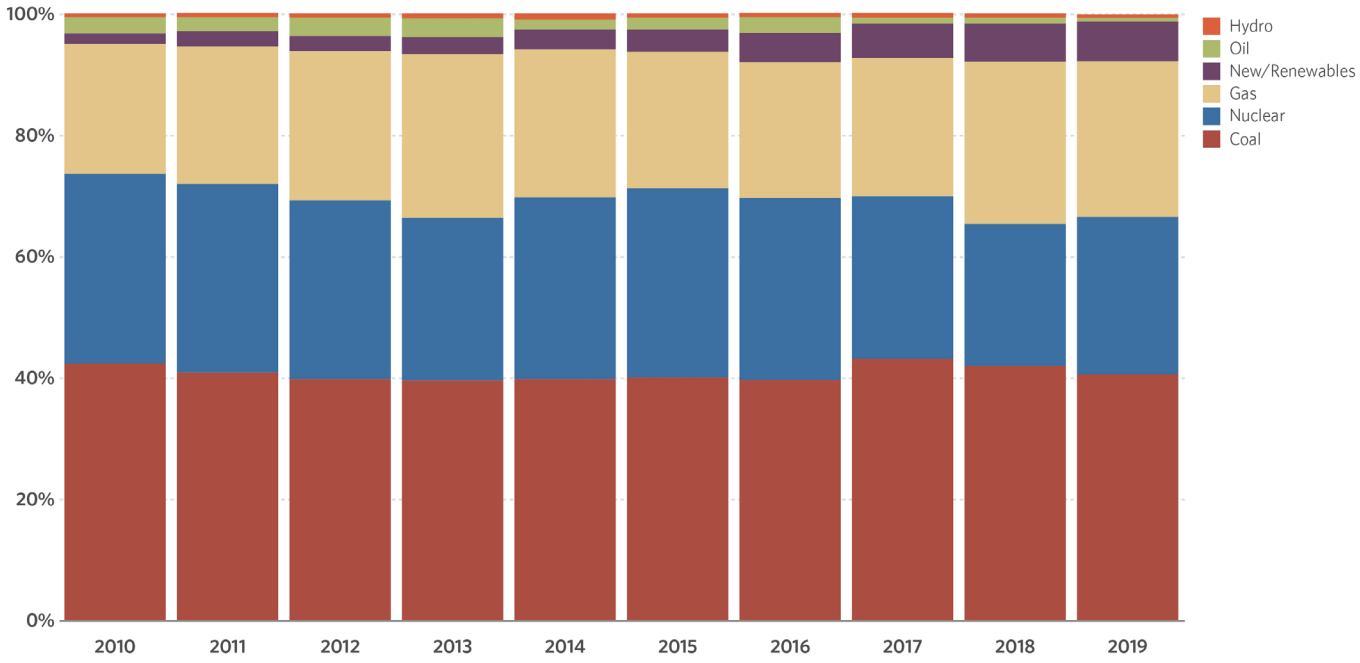
2.1.2 PRE-COVID-19 ELECTRICITY SUPPLY AND DEMAND

Despite the gradual shift in policies, the observed trends of electricity supply and demand over the past decade do not clearly exhibit a shift to a more sustainable path.

Total annual electricity supply increased from 474,660GWh in 2010 to 563,040GWh in 2019, an 18.6% increase, showing an annual increase of 1.9% on average. As shown in Figure 2.1, although the share of new and renewable energy sources increased by more than three times during the same period, it remains meager.

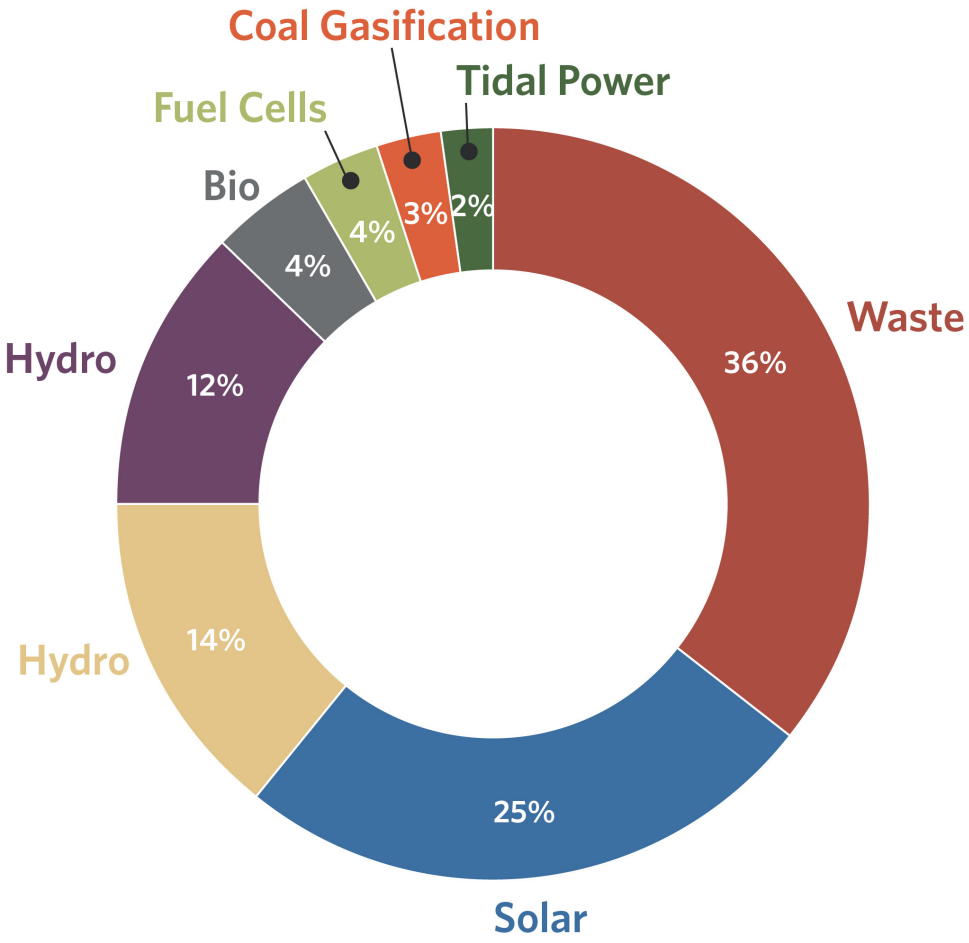
Meanwhile, the classification of new or renewables includes non-renewable sources, such as fuel cells, coal gasification, and waste, as the breakdown of sources in Figure 2.2 shows.

Figure 2.1: Electricity production shares by source (2010-2019)



Source: Statistics South Korea

Figure 2.2: Monthly generation capacity by new or renewable source (2019.10, MW)

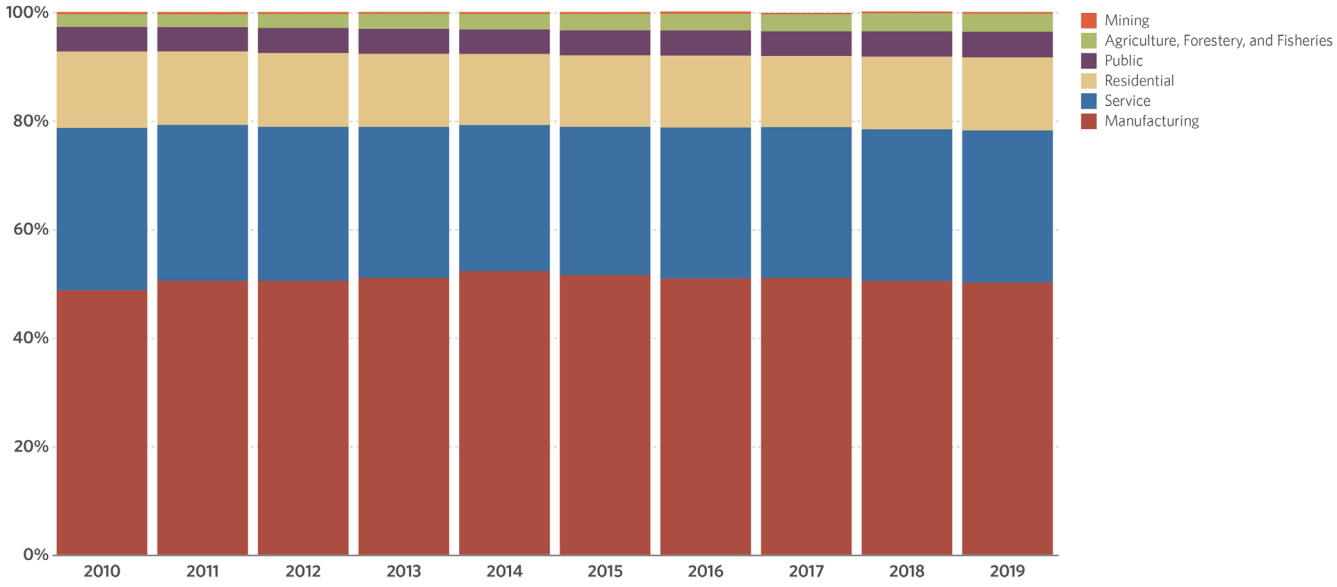


Source: EPSIS

Meanwhile, total electricity demand increased from 434,160 GWh in 2010 to 520,499 GWh in 2019.

As illustrated in Figure 2.3, which shows annual electricity demand (in terms of electricity sales amount) by sector, the manufacturing sector accounted for the highest portion. It amounted to approximately 50% of all electricity demand without much fluctuation. This confirms the high relevance between electricity demand and economic growth.

Figure 2.3: Electricity Demand Shares by Sector (2010-2019)



Source: EPSIS

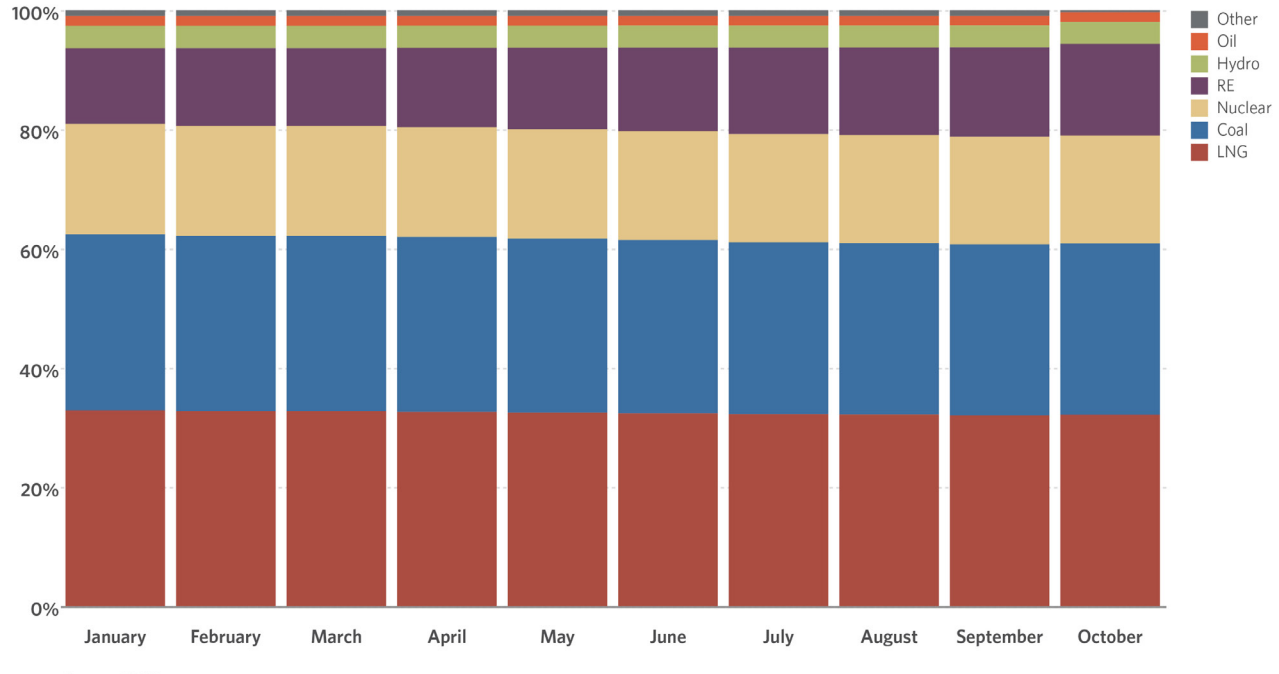
2.1.2 POST-COVID-19 ELECTRICITY SUPPLY AND DEMAND

The trend of electricity supply, in terms of generation capacity, from the beginning of 2020 is shown in Figure 2.4.

While the share of most sources remained relatively constant, that of new and renewable energy sources has steadily increased throughout the year.

However, the data is based on generation capacity rather than generation amount. Due to data availability issues, the overall share of new and renewables and LNG has become much more pronounced compared to Figure 2.1.

Figure 2.4: Electricity Generation Capacity by Source (2020)



Source: EPSIS

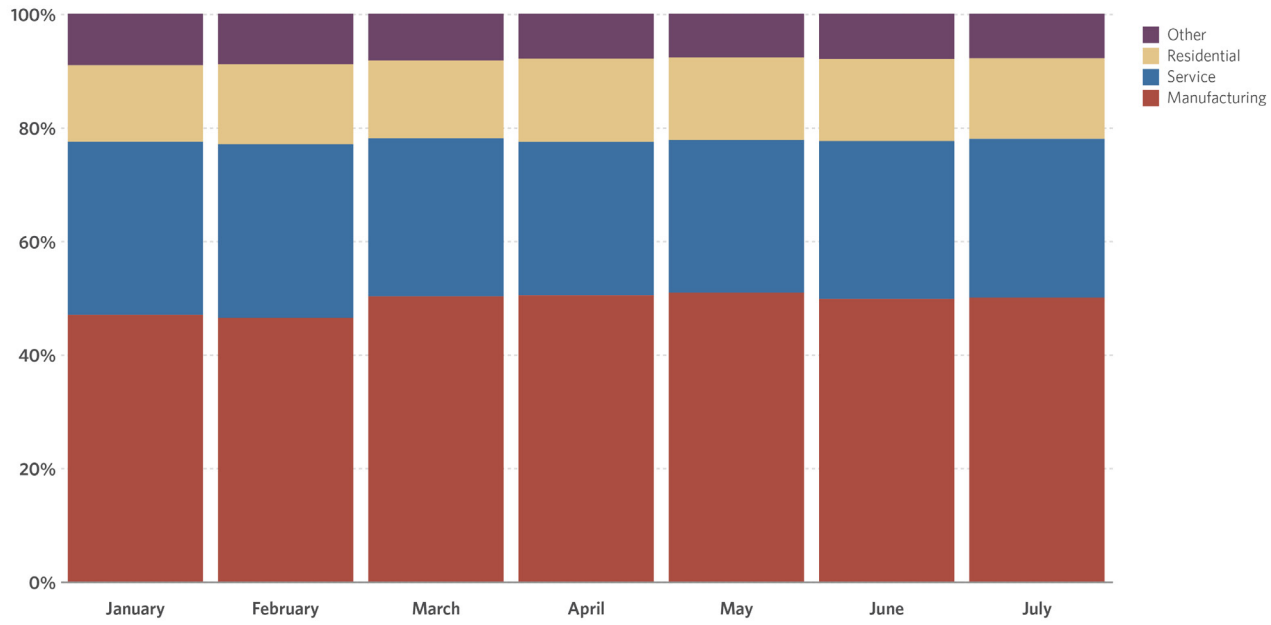
Figure 2.5 shows monthly data on the share of electricity demand by sector for 2020, while Figures 2.6a, 2.6b, and 2.6c compare monthly data on electricity demand between January and July for the years 2019 and 2020 by sector. According to the South Korean Energy Economics Institute (KEEI), electricity consumption from January to July in 2020 had reduced by 2.8% in comparison with the same period in 2019.

While the COVID-19 pandemic was mainly responsible for this change, warm weather during the winter season was also partially responsible as consumers required less heating. Breaking down the reduction in electricity consumption by sector, the industrial and commercial sector each showed a decrease of 5.1% and 1.7%, respectively.

Electricity demand decreases in the commercial sector began to be noticeable from February, when COVID-19 cases worsened domestically in South Korea. The decrease in the industrial sector became obvious during March and April, when the pandemic began to worsen in the major export areas in Europe and the USA.

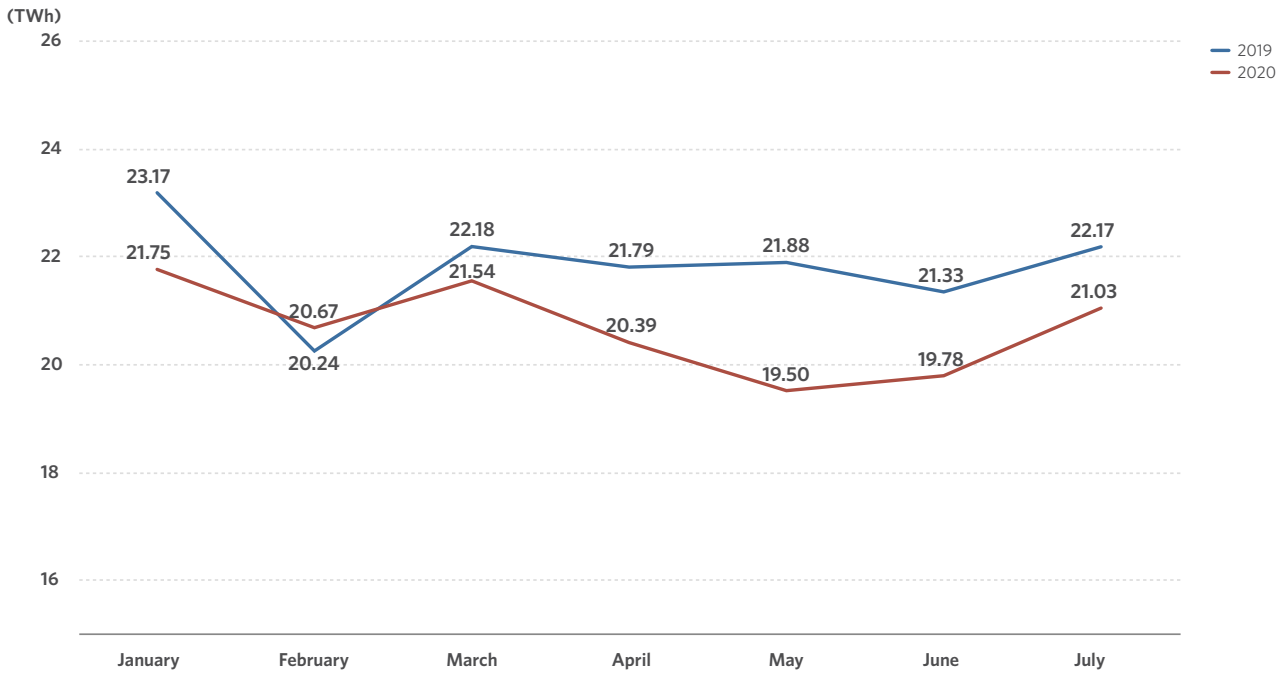
In contrast to these two areas, residential electricity demand, in fact, increased by 5.5%. This may be due to social distancing, which led to a decrease in outdoor activities and people staying at home for longer hours.

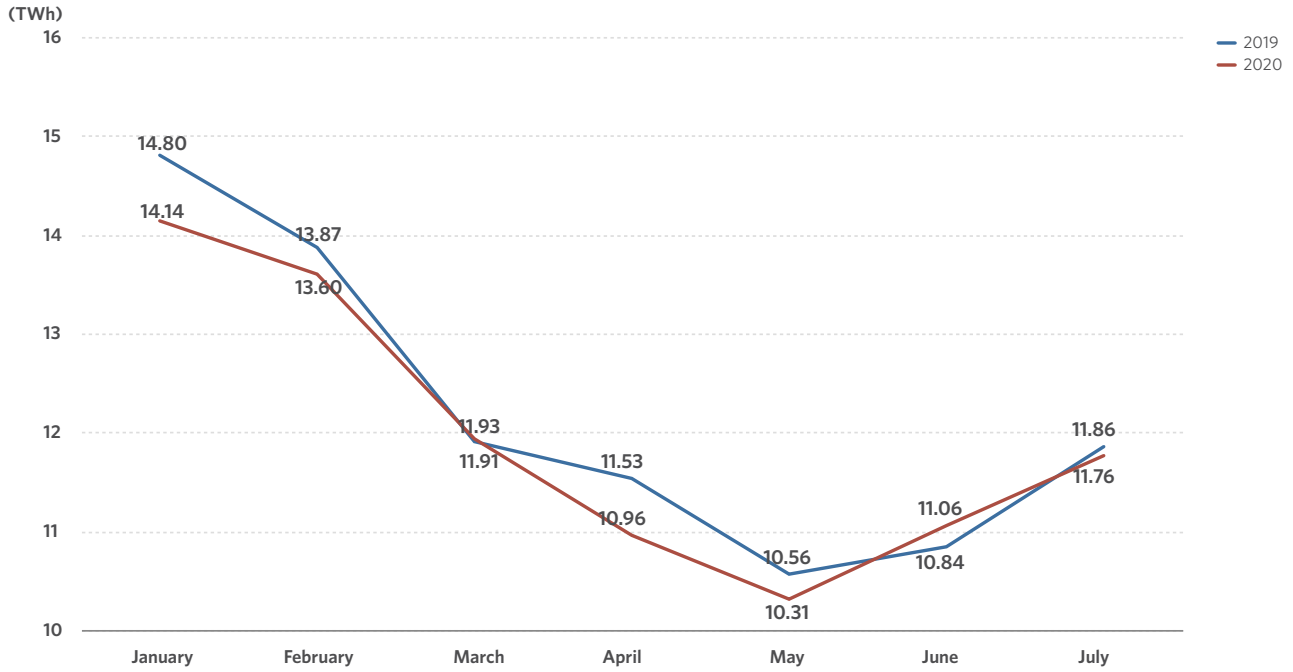
Figure 2.5: Electricity Demand by Sector (2020)

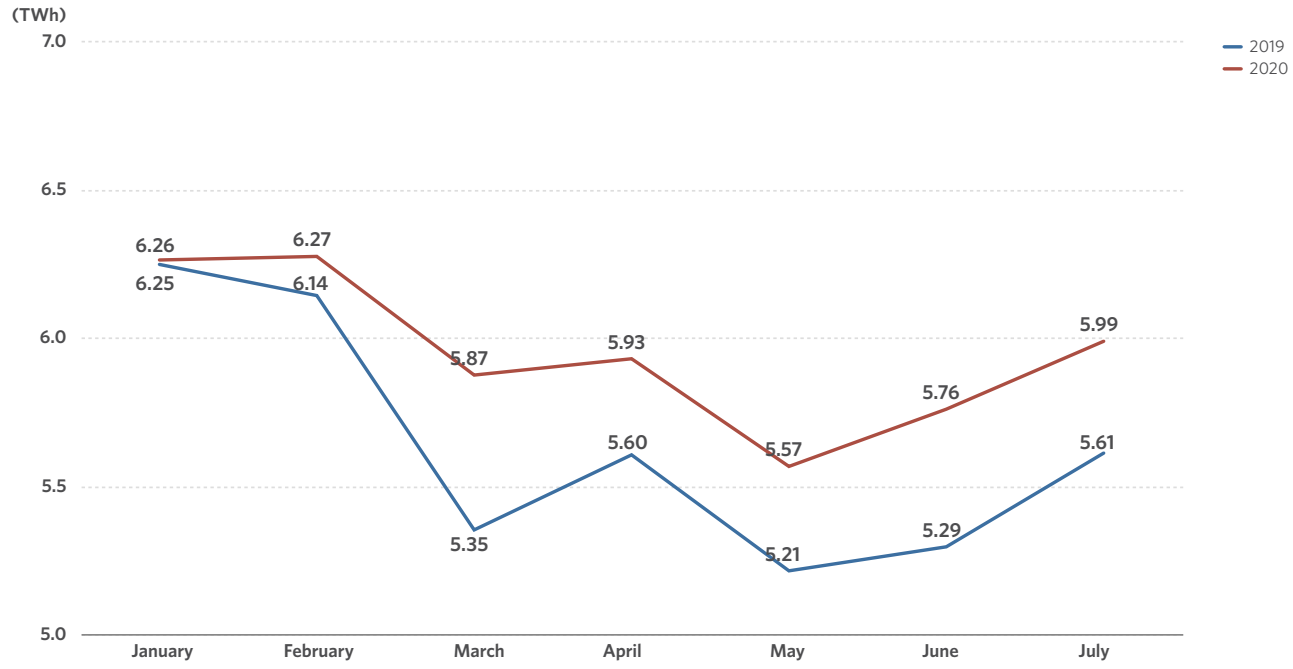


Source: KEPCO

Figure 2.6: Electricity Demand for (a) Manufacturing Sector, (b)Service Sector and (c) Residential Sector (TWh, 2019 01~07 & 2020 01~07)







Source: KEPCO

2.2 FISCAL STIMULUS IN SOUTH KOREA TO AID ECONOMIC RECOVERY

Since the outbreak of COVID-19, the South Korean government has aggressively introduced fiscal stimuli with policy packages amounting to a total of USD 252 billion (KRW 277 trillion), as of July 2020.

From early February, the national assembly discussed the supplementary budget for the year and revised it four times. The last of these discussions proposed a cumulative increase in the budget of USD 60.7 billion (KRW 66.8 trillion).

The main components of the increased budget are largely directed towards strengthening job and social security, economic recovery, tax revenue adjustments, and fiscal support for industries and businesses.

Included in the packages for economic recovery is the South Korean new deal (KND), which constitutes 7.6% of the total USD 4.6 billion (KRW 5.1 trillion). This is only the first stage of the fiscal stimulus package that will be directed towards a green and digital transition of the economy and society. This is the first of its kind to be introduced in the country.

Although the general need is explained in terms of falling growth rates (from 6.9% in the 1990s to 2.9% in the 2010s), and the worsening of social polarization due to a lack of social safety nets, COVID-19 undoubtedly served as a direct catalyst. Not unlike the situation around the globe, the pandemic has led South Korea into an unprecedented economic recession, prompting large-scale changes in economic and social structures.

Of at least equal importance, however, are growing concerns over the changing climate, compared to which COVID-19 may only be the tip of the iceberg. South Korea has not been immune to abnormal or extreme weather events, such as heat and cold waves, stronger and more frequent typhoons, and intense precipitation. Such occurrences have caused society to incur various losses and costs, including in terms of human lives, health, property, infrastructure, agriculture, and restoration costs.

According to a recent study, the scope of damage due to natural disasters through 2060, estimated in terms of annual damage costs, could be as high as USD 20.9 billion (Lee et al., 2017). This is a substantial amount that is over 1% of the country's estimated future GDP, and sheds light on the critical importance of climate change mitigation and adaptation activities.

Under this overall context, this chapter will proceed to provide an overview of the green new deal (GND), and then delve deeper into the details pertaining to a country-level energy transition. This is divided into two sections relating to the supply and demand sides of the issue.

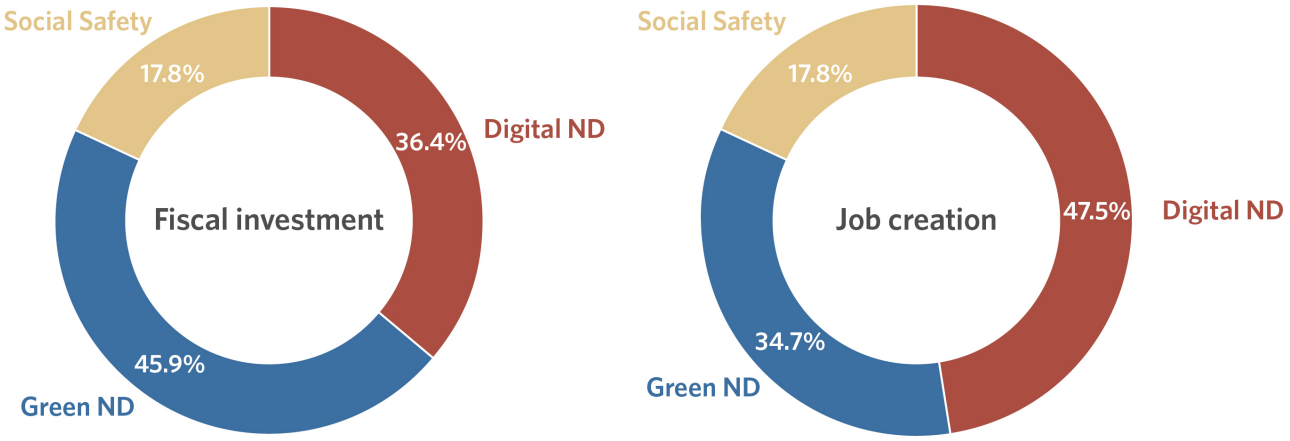
2.2.1 TARGETS AND POLICIES OF THE GREEN NEW DEAL (GND)

According to the plan released by the Ministry of Economy and Finance (MoEF) on 14 July, 2020, the full package to be implemented by 2025 equals USD 145.5 billion (KRW 160 trillion). It is expected to create 1.9 million jobs. Of the total, 45.8% or USD 66.7 billion (KRW

73.4 trillion) is specifically directed towards the GND, while the majority of the remainder will be directed towards the digital new deal, and a smaller portion towards strengthening social safety nets. Through the KND policy and large-scale public investments, the government hopes to also induce large-scale private investments that currently constitute 28.7% of total investments at USD 41.7 billion (KRW 45.9 trillion).

As shown in Figure 2.7, the proportion of private to public investments is higher for the GND compared to the digital new deal, which may signify a potential challenge.

Figure 2.7: South Korean new deal investment and job creation plan by 2025



Total	B = 137 (160.0) E = 98 (114.1)
Digital new deal	B = 90 (58.2) E = 38.5 (44.8)
Green new deal	B = 65 (73.4) E = 36.3 (42.7)
Social safety	B = 24 (28.4) E = 22.9 (26.6)

Total	190.1
Digital new deal	90.3
Green new deal	65.9
Social safety	33.9

B = total required budget, E = government expenditure

Unit: Billion USD (trillion KRW), ten thousand jobs

Government policies and projects proposed under the GND are largely grouped into three categories:

(1) Green transition of buildings and infrastructure

(2) Expansion of low-carbon and distributed energy

(3) Green industrial innovation

The list of projects, allocated budget, and expected number of jobs created under each category are listed in Table 2.2.

Table 2.2: Green new deal investments and job creation by project

Category	Project	Public investment (% of total)	Private investment (% of total)	Total investment (% of total)	Job creation (% of total)
Green buildings & infrastructure	Zero energy public buildings*	6.2 (8.45)	13.8 (18.80)	20.0 (27.25)	24.3 (36.87)
	Ecological restoration	2.5 (3.41)	1.3 (1.77)	3.8 (5.18)	10.5 (15.93)
	Clean & safe water management system	3.4 (4.63)	2.9 (3.95)	6.3 (8.58)	3.9 (5.92)
	Subtotal	12.1 (16.49)	18.0 (24.52)	30.1 (41.01)	38.7 (52.72)
Low-carbon & distributed energy	Smart grid	2.0 (2.72)	2.2 (3.00)	4.2 (5.72)	2.0 (3.03)
	New & renewable energy*	9.2 (12.53)	2.1 (2.86)	11.3 (15.40)	3.8 (5.77)
	Green mobility*	13.1 (17.85)	7.2 (9.81)	20.3 (27.66)	15.1 (22.91)
	Subtotal	24.3 (33.11)	11.5 (15.67)	35.8 (48.77)	20.9 (28.47)
Green industrial innovation	Green business & industrial complexes	3.6 (4.90)	1.3 (1.77)	4.9 (6.68)	4.7 (7.13)
	Green innovation	2.7 (3.68)	0.0 (0.00)	2.7 (3.68)	1.6 (2.43)
	Subtotal	6.3 (8.58)	1.3 (1.77)	7.6 (10.35)	6.3 (8.58)
Total		42.7 (58.17)	30.7 (41.83)	73.4 (100.00)	65.9 (100.00)

*Projects included in the 10 key projects of the South Korean new deal

(unit: trillion KRW, ten thousand jobs)

The first and second categories constitute almost 90% of the investments and are expected to create 81% of the jobs, implying that they hold relatively more weight.

This can also be attributed to the fact that the three projects included in the ten key projects of the KND fall under these two categories.

The government anticipates that the key projects will serve as the core, spurring ripple effects on the other projects and society at large[2].

2 The projects were selected based on the following criteria:
- Projects with large ripple effects (e.g. boosting economic vitality)
- Projects that have a significant effect on promoting balanced regional development and revitalizing local economies
- Projects that will create large numbers of sustainable jobs, including in the short-term
- Projects that result in palpable changes and outcomes
- Projects that have the potential to bolster the impact of private investment, such as revitalizing new businesses

2.2.2 GREEN NEW DEAL POLICIES ON ENERGY SUPPLY

As noted in the previous chapter, energy supply in the Republic of South Korea is still largely reliant on fossil fuels, namely coal and natural gas, and nuclear, with the share of renewable energy sources remaining at only 5.6% as of 2019 (IEA, 2020).

This is a serious concern globally and internally, particularly because of the country's economic status and contribution to greenhouse gas (GHG) emissions. However, so far change has been extremely slow.

The GND, however, aims to turn the tide and boost the transition to renewables, by promoting research and development, further dissemination, and ensuring a just transition.

The main focus of the deal falls largely on solar and wind power. Under the GND, support will be provided to increase PV panel installations in residential and commercial buildings (up to 200,000 households), farming areas, and industrial complexes.

In addition, by establishing a joint research center among public and private actors, the government aims to promote R&D, and support domestic PV manufacturers in carrying out product performance and quality testing.

In the case of wind, the government plans to support the development of large-scale offshore wind power, particularly with regards to conducting feasibility studies and measurements, which has been identified as a key barrier to private investment.

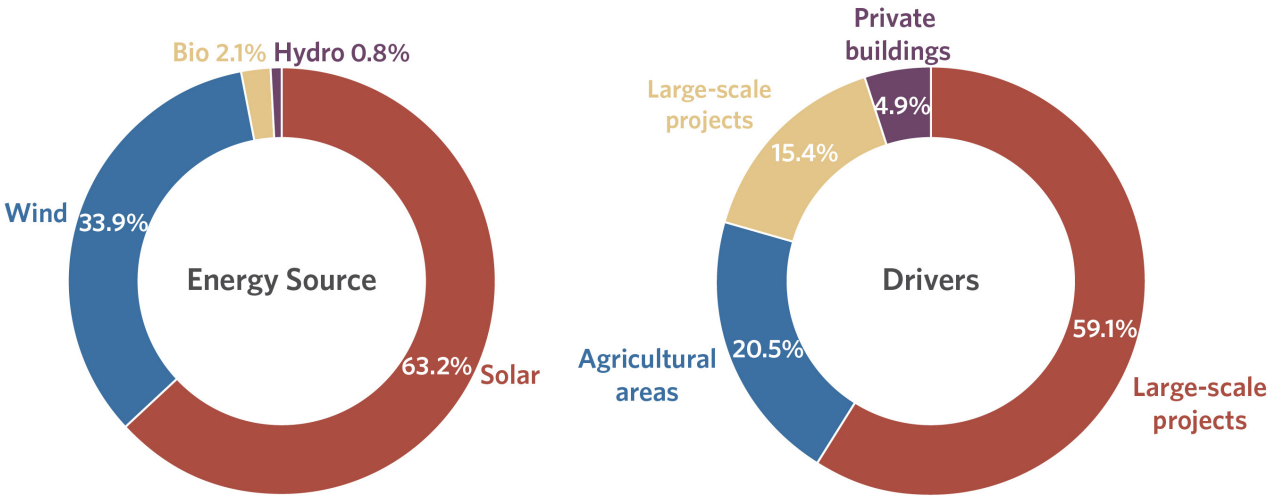
Generic plans to introduce energy projects based on citizen participation, and profit sharing models, such as the provision of support for investment loans for local residents participating as shareholders, also exist.

While the GND does not offer concrete targets, it falls in line with the 2030 renewable energy implementation plan, released by the Ministry of Trade, Industry and Energy (MoTIE) in December, 2017.

Under the plan, the share of new and renewable energy will be increased from 7.6% in 2017 to 20% in 2030. Generation capacity will be amped up from 15.1GW to 63.8GW.

Although the share of waste and bioenergy constituted 41% initially, most of the capacity increase of 48.7GW will come from solar (30.8GW, 63%) and wind (16.5GW, 34%) sources. This will ensure that together their share will jump from 46% to 85%. The breakdown in terms of drivers is shown in Figure 2.8.

Figure 2.8: Renewable energy development plan by energy source and driver



Total	48.7 (100.0%)
Soal	30.8 (63.2%)
Wind	16.5 (33.9%)
Bio	1.0 (2.1%)
Hydro	0.4 (0.8%)

Total	48.7 (100.0%)
Large-scale projects	28.8 (59.1%)
Agricultural areas	10.0 (20.5%)
Small-scale projects (cooperatives, etc)	7.5 (15.4%)
Private buildings (residential, commercial)	2.4 (4.9%)

Unit: GW

Targets such as these and the GND policy in general will be supported by a number of measures. By amending the enforcement decree of the act, on promoting the development, use and diffusion of new and renewable energy, the mandatory requirement for public institutions will be increased from 30% in 2020 to 40% by 2030. The renewable energy portfolio standard (RPS) for generation companies will also be increased.

Further, changes are included in the necessary amendments to strengthen the role of central and local governments in developing larger scale complexes for renewable energy installations. This will help prevent and alleviate conflicts that tend to arise with local residents.

In addition, the government plans to introduce the power purchase agreement (PPA) that will open the doors for domestic businesses that wish to participate in the RE100 initiative. This long overdue measure will require amendments to the electric utility act.

2.2.3 GREEN NEW DEAL POLICIES ON ENERGY DEMAND

Policies on energy demand largely pertain to the sectors of transportation, industry, and buildings. This section will focus on green remodeling and eco-friendly future mobility.

However, there are additional measures, such as green smart schools to promote the convergence of green and smart technologies in classrooms and create an eco-friendly and digital educational environment.

Additionally, measures such as smart green cities can help support more tailored regional efforts to improve environmental quality, utilize ICT technologies, and provide a comprehensive diagnosis of urban climate and environmental issues.

These measures will further support government efforts to increase energy efficiency and better manage energy demand.

2.2.3.1 GREEN REMODELING

In South Korea, the construction and building sector was reported to account for 25% of GHG emissions and 20% of energy consumption (Sung, 2017). Therefore, preventing energy leakage from aged buildings is a particularly important task for the country, where 37.8% of all buildings are old, i.e., aged over 30 years (MoLIT, 2020).

Green remodeling is a key response policy that aims to increase the number of zero energy buildings or buildings that reduce the amount of energy used. Zero energy buildings accomplish this by strengthening insulation and air-tightness performance (passive technology methods), and minimize energy consumption through renewable energy production (active technology methods). Such interventions are expected to save more than 44% of heating costs, especially in the winter season.

In line with the emissions reduction target of 32.7% for the building sector under the national roadmap for GHG reductions, the GND includes green remodeling as a key policy. It aims to create 7.8 million jobs by investing USD 2.8 billion (KRW 3.1 trillion) by 2022, and create 1.24 million jobs by investing USD 4.9 billion (KRW 5.4 trillion) by 2025.

At this early transition stage, however, the target is confined to public buildings, including public rental houses, daycare centers, sports centers, health and medical institutions, cultural facilities, and government office buildings.

Green remodeling for old buildings aims to improve energy efficiency or reduce energy use by installing solar energy systems, and replacing insulation materials and other equipment needs such as more efficient lighting.

Newly constructed buildings will be required to use high-efficiency equipment and eco-friendly materials. In addition, USD 1.8 billion (KRW 2 trillion) will also be invested to jointly neutralize wires and telecommunications lines in areas with a high need for support, such as routes around schools.

Such changes, however, are not completely new introductions. To fulfill the country's GHG reduction goal, promote new and renewable energy source expansions, and better respond to the fine dust problem, the government announced the roadmap for mandatory zero energy buildings in 2016.

This roadmap gradually expands the zero energy mandate from medium and large-sized public buildings (with a floor area of 1,000m2 or more) in 2020 to include smaller public buildings (with a floor area of 500m2 or more) and medium and large-sized private buildings in 2025.

It will also bring in all public and private buildings with a floor area of 500m2 or more in 2030. The GND is expected to merely accelerate this plan and strengthen reinforcement, prompting the changes to happen earlier.

2.2.3.2 ECO-FRIENDLY FUTURE MOBILITY

The growth of electric and hydrogen cars has been a rising focus area for the South Korean government. This is a key measure for the nation to reduce air pollutants such as GHG and fine dust, and continue to lead the global car market.

For instance, the comprehensive plan for fine dust management, introduced in 2019, included the goal of increasing the number of electric vehicles to 850,000 by 2024, and to 1.5 million by 2025.

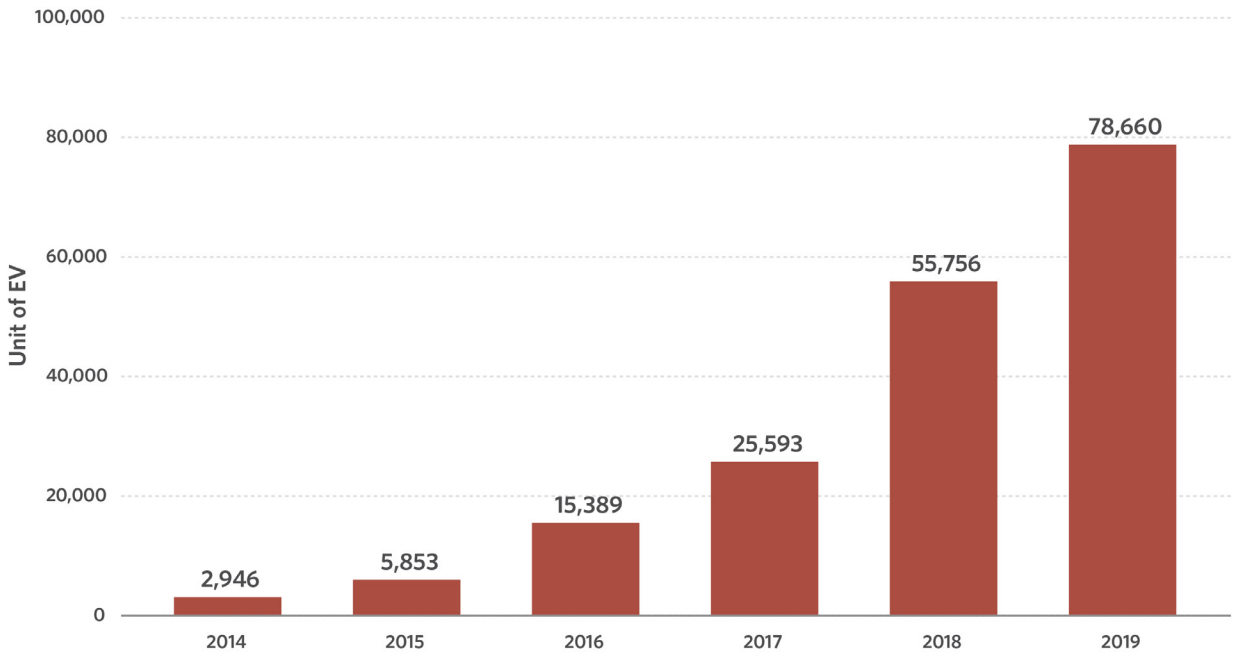
The plan offers several benefits:

(i) Consumers who purchase electric vehicles enjoy subsidies of varying amounts, depending on the type of vehicle, price, performance, and effect on air pollution improvement.

(ii) They also receive several benefits, including tax reductions (for individual consumption tax, education tax, and acquisition tax) and discounts on congestion fees and at public parking lots (Shim et al., 2019).

The result of this policy is illustrated in Figure 2.9 with the number of electric vehicles gradually increasing over time.

Figure 2.9: Number of electric vehicles in South Korea



Source: MoLIT

Following such a policy path, the expansion of eco-friendly vehicles is a key policy under the GND, with the objective of transforming the current oil-reliant transportation system.

As for electric vehicles, the government plans to supply a total of 1.13 million vehicles, including taxis, buses, and cargo trucks, and strengthen infrastructure by installing 1.5 million fast chargers and 3.0 million slow chargers.

With hydrogen cars, the aim is to supply a total of 200,000 vehicles, including passenger cars, buses and cargo. In terms of infrastructure, the plan aims to install 4.5 million charging facilities, create hydrogen distribution bases that produce hydrogen near areas with demand, and ensure a stable supply.

The comparison between the existing policy and the GND policy is shown in Table 2.3 below.

Table 2.3: Comparison of existing policies with green new deal mobility policies

	Fine Dust Management Comprehensive Plan (existing policy)				**South Korean Green New Deal (2020)**				
	Electric cars	**Hydrogen cars**	**Electric vehicle rapid charging**	**Hydrogen charging station**	**Electric cars**	**Hydrogen cars**	**Electric vehicle rapid charging**	**Electric vehicle slow charger**	**Hydrogen charging station**
Target year	2024				2025				
Target year	850,000	150,000	15,000	450	1,130,000	200,000	15,000	30,000	450

Plans to reduce the number of aged diesel vehicles and vessels will come into effect simultaneously.

Also, under the fine dust management comprehensive plan of 2019, the government aimed to complete the withdrawal of more than 80% of aged diesel cars by 2024. To do so, the government has been providing subsidies for early scrapping and switching to non-diesel models.

An exception applies to subsistence vehicles, where support is provided to attach a diesel particulate filter (DPF) or convert to an LPG engine (Shim et al., 2019).

The GND reinforces the plan, with intentions to:

- Convert 1.35 million trucks and 8.8 million school vehicles into LPG-powered or electric vehicles
- Promote the early disposal of 1.16 million diesel cars and construction machinery, and 3.2 million agricultural machineries
- Convert government-owned and private ships and vessels
- Invest in technology development, such as for future electric vehicle parts, fuel cell systems for hydrogen cars, and mixed fuel systems for eco-friendly ships

2.2.4 EVALUATION AND OUTLOOK FOR THE GREEN NEW DEAL

Although the introduction of the GND is undeniably a welcome development, it is not without its shortfalls. This becomes more evident when it is compared to the European Green Deal.

The European Green Deal covers a longer period of ten years and directs an equal focus to responding to the climate crisis (Chung, 2020). Such a difference in perspective seems apparent from the choice of name, i.e., green deal versus green new deal.

South Korea's model, which primarily emphasizes fiscal investments and job creation, is reminiscent of the new deal following the Great Depression, and remains distant from a proactive response to climate change. It also fails to include specific targets, timelines, and plans to reduce emissions and stimulate economic recovery.

By comparison, the EU has proposed new legislations that stipulate emissions reduction targets, and a revision of all relevant policies with detailed plans for measurement and monitoring.

Table 2.4: Comparison between South Korean new deal and EU green deal

	South Korean Green New Deal	EU Green Deal
Budget	USD 63.62 billion (KRW 73 trillion)	USD 1.18 trillion (1 trillion EUR)
Net-zero Target (including energy transition agenda)	X	O
Period	5 years	10 years
Budget to GDP scale	0.70%	0.60%
% of government finance/total project costs	37%	53%
Legislation	X	O

Source: Chung, 2020

2.3 OPPORTUNITIES AND CHALLENGES IN RENEWABLE ENERGY DEVELOPMENT IN SOUTH KOREA

As one of the early movers to declare carbon neutrality and introduce a GND in Asia, South Korea has attracted the attention of many nations. It has given rise to expectations concerning how the country will align its GND policy with previous climate policies, along with plans for economic recovery, both from abroad and within.

However, South Korea does not have a notable green record or a particularly enabling environment. Out of 61 countries, it ranked 58th in the climate change performance index of 2020, and was identified as one of the 'bottom three performers' that 'fail[ed] to make any progress in GHG emissions'(GermanWatch, 2019).

Despite the opportunity to holistically address issues concerning the environment, energy transition, sustainable development, and socio-economic problems, past challenges that have hindered such an undertaking continue to exist. This chapter aims to more clearly present a view of the opportunities and challenges of the GND to address debates that have risen over policy prospects.

2.3.1 BARRIERS TO CLEAN ENERGY TRANSITION IN SOUTH KOREA

2.3.1.1 HEAVILY CENTRALIZED MARKET STRUCTURE: THE MAIN HINDRANCE TO THE PROLIFERATION OF RENEWABLE ENERGY

In its present state, the current energy market and structure in South Korea presents a key obstacle to a renewable energy transition. Electricity in South Korea is mainly generated and distributed by the South Korean Electricity Power Company (KEPCO).

While KEPCO is a public company supervised by the government, the company shows characteristics of a monopoly firm in the market. KEPCO possesses 100% shares in the six main subsidiary power generation companies, and is solely in charge of transmission, distribution and sales.

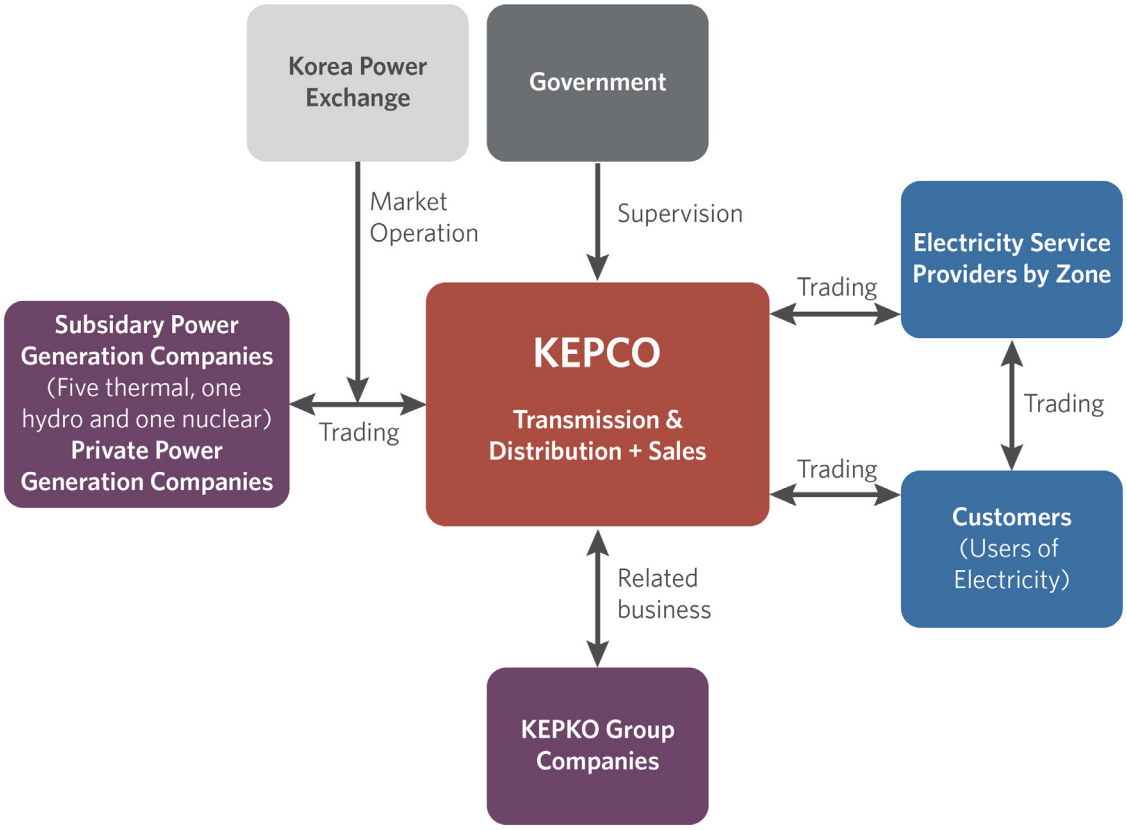
Although other independent private power generation companies exist, they remain a minority in the market, while the electricity they sell through the South Korea Power Exchange (KPX) is eventually bought in its entirety by KEPCO.

This heavy centralization influences how electricity is supplied in South Korea with heavy concentration towards coal, nuclear and natural gas.

There are further complications. “Large consumers (> 10MWh) can buy power directly from the wholesale market, while smaller and domestic consumers are subject to regulated tariffs. Electric power volumes above 20MWh must be traded in the wholesale market” (Jensterle et al., 2019).

The presence of such limits and complications has made it impossible for the private power purchase (PPP) market to develop (Seol et al., 2020).

Figure 2.10: Structure of KEPCO



Source: KEPCO

The nation's electricity price, which was found to be the lowest among OECD countries (OECD, 2018), is relevant in this context. In the current distorted market, the price is largely determined by the energy source, much of which is produced from fossil-fuels and nuclear.

As such sources are likely to be initially cheaper than renewable sources, the entrance of private actors into the renewables sector, and the introduction of benefit-sharing models for increased dissemination may be hindered.

Considering that a successful transition also entails the increase of active participation from various private actors and 'prosumers,' who are not merely passive consumers, a change in the energy market and structure is imperative.

2.3.1.2 ATTRACTING PRIVATE INVESTMENT: THE KEY FISCAL CHALLENGE FOR A SUCCESSFUL ENERGY TRANSITION

The main fiscal and financial challenge that the GND plans to address is to create a desirable environment for the influx of private investment.

As mentioned in the previous sub-chapter, 41.8% of the GND itself is dependent on private investments, and a green transition cannot be sustained with public resources alone. In other words, the challenge faced by South Korea is not one of a lack of available resources, but one of well-spent public resources to effectively access and draw in those financial opportunities.

Therefore, the key focus of the government's policies and public investments under the GND must be to prime the market, and lower the uncertainties and risks faced by private investors. This means lifting any institutional barriers. For instance, blocking power purchase agreements, and stepping in to support investments that are either too risky or unprofitable for the private sector such as improving infrastructure, would make a difference.

So far, the GND appears to have sent out the right signal and has begun to pave a favorable path. This is apparent as South Korea's rank has jumped from 17th to 13th in the renewable energy country attractiveness index (RECAI) released in November, 2020 (EY, 2020).

There are, however, concerns over public spending levels, which have been adding up. Compared to the government debt-to-GDP ratio of 37.7% at the end of 2019 (K-indicator, 2020), the number has jumped to 43.9% in less than a year, according to the latest budget adjustment (MoEF, 2020).

As a result, there are concerns about the country's fiscal soundness and financial sustainability. This may be related to the investments made through the stimulus packages, as higher government debt may negatively influence effectiveness in the long-run (Nickel & Tudyka, 2013).

2.3.1.3. SOCIAL ACCEPTANCE: AN IMPROVING YET PERSISTING HURDLE

Social acceptance is important to gain legitimacy in a democratic society, and also because it is crucial to secure funds. Overall, it acts as a determining factor that influences success in the long run. Unfortunately, energy transition projects have not yet earned full public support and have been marked by cases of serious social conflicts.

An example is a project to install floating solar panels carried out in the Saemangeum coastal area, which led to conflicts over fishing grounds with locals involved in the fishing industry (Lee, 2019).

Generally, resistance stems from the perception that the welfare and concerns of local populations have been largely ignored in favor of affluent society that consumes much higher levels of electricity.

Another infamous case is that of Miryang, where a long conflict ensued over the construction of a high voltage transmission tower in farming areas. Although this case is not specifically related to renewable energy transition, it illustrates the challenges that can follow projects to expand infrastructure.

Despite recent signs of improvement, negative perceptions against renewable energy continue to persist. One of the main concerns surround electricity prices. While the price of renewable energy can become competitive in the long run, energy transition can create a risk in the form of an unreliable power supply.

In its early stages, it can also lead to price uncertainty, as technologies have not yet matured (Hong et al., 2019; Blazquez et al., 2016).

Intertwined with these issues is the problem of nuclear lobbying and conservative ideologies, which continue to question the reliability of renewable energy sources and oppose the phasing out of nuclear power.

However, the energy transition in Germany has shown that, despite the fact that the shift may be costly in the beginning, energy prices will eventually fall.

A related and perhaps more serious problem is the spread of misinformation, or the rise of fake news over solar and wind installations.

Numerous examples of false claims exist. These range from exaggerated health threats posed by electromagnetic waves from solar panels, claims of public opposition due to light pollution, and risks of blackouts due to the instability of renewable sources. These issues pose a barrier that can hinder the government in its efforts to establish its projects.

2.3.2 OPPORTUNITIES: POLICY RECOMMENDATIONS TO ACCELERATE CLEAN ENERGY USE

2.3.2.1 STRONG GOVERNMENT COMMITMENT TOWARDS NUCLEAR AND COAL PHASE OUT: A SIGNIFICANT OPPORTUNITY FOR CHANGE

Along with the declaration to achieve carbon neutrality by 2050, the government's plans to phase out nuclear and coal present opportunities for an energy transition.

Two aged units (Gori, Wolsung) have already been shut down. In addition, the MoTIE has released plans to reduce the number of nuclear power plants from the current count of 24 to 17 by 2034, through the draft 9th basic plan on electricity demand and supply.

The two units of the Shinhanwool power plant development was cancelled. As for coal power, the government plans to shut down 30 out of 60 power plants over the same period, although 24 of them will be replaced with liquefied natural gas (LNG) plants.

Recently, the government made additional announcements to terminate the construction of overseas coal power plants after 2050.

It also plans to phase out a coal plant in the Philippines and convert it into an LNG plant. However, a moratorium for projects in Indonesia and Vietnam has not yet been announced.

Commitments beyond national borders hold importance. This is because phasing out coal from the electricity mix has implications in terms of reducing costs related to GHG emissions, and impacts the global endeavor against climate change (Climate analytics, 2020).

2.3.2.2 RENEWABLE POWER PURCHASE AGREEMENT (PPA): THE LONG-AWAITED CHANGE IN THE PIPELINE

A successful energy transition requires the participation and support of private entities to achieve net zero emission targets.

The rapid growth of the RE100 initiative is a case in point. When players join the initiative, they make a commitment to source 100% of a company's energy use from renewables.

Global giants such as Apple, Google, and BMW have joined the movement, and these developments have put pressure on South Korean companies to follow suit, as many lie within global supply chains.

For instance, Apple has shown signs of preferring a semiconductor company in Taiwan over Samsung, as the former has announced its intention to join the RE100 initiative, while the latter has not.

Although many companies in South Korea, including Samsung, SK Hynix, and LG Chem, have shown a desire to take part in the initiative, the impossibility of entering into a PPA is a major barrier.

If the relevant laws are revised to allow PPAs, the road towards the expansion of renewable energy and carbon neutrality will be much easier to navigate. This is what the government plans to do.

2.3.2.3 TECHNOLOGICAL DEVELOPMENT AND INNOVATION: AN AREA WITH A PROMISING OUTLOOK

Support policies are instrumental towards reducing costs and propelling the growth of new markets. During the last decade, the renewable energy market in South Korea has been able to experience growth backed by such support.

Along with plans to increase installation capacity for solar and wind power under the 3020 renewable energy implementation plan, projects under the GND present additional opportunities for the expansion of renewable energy. These projects include building smart energy complexes and constructing zero energy buildings that consume less electricity and generate lower GHGs.

Government support, increased cooperation among the various stakeholders, and increased public and private investment can help form an enabling environment to boost technological development and innovation.

South Korea is also known for being a global ICT leader, and is home to a number of powerful businesses in the renewables sector. Hanwha Q Cells' solar panels boast a US market share of 25.2% for households and 13.3% for the industrial sector.

In 2019, Shinsung E&G won a contract with Sunpower to supply solar cells that will generate 322MWh, which is enough to power 100,000 households.

Therefore, promising opportunities for public-private partnerships exist. Better incentives for various actors in society are expected to be provided on the basis of past failures to get them more involved.

2.3.2.4 INTEGRATION AND COORDINATION WITHIN THE ENERGY GOVERNANCE STRUCTURE: A CHANCE FOR IMPROVEMENT OFFERED BY THE GREEN NEW DEAL

Currently, the national plans and targets for climate change, energy, and sustainability are not fully integrated and coordinated with each other. For instance, while issues related to the environment and climate change are largely governed by the Ministry of Environment (MoE), the management of energy supply and demand falls under the jurisdiction of the MoTIE.

Although it lacks a concrete timeline and implementation plan, the GND could serve as an enabler for the much-needed integration and coordination of policies.

The same can be said for bridging the gap, and strengthening cooperation and coordination, between the central and local governments, which is especially desirable for a successful country-level transition.

Despite the fact that some regions like Seoul have released proactive implementation plans, there remains a lack of structure for substantive coordination. Consequently, the role of local governments has been limited to participating in central government projects to support local activities. These are usually directed at increasing installations for renewable energy.

An alternative to such a top-down approach may be the place-based strategy, adopted by the EU. According to this strategy, solutions must take into account the particular economic, social, geographic and environmental challenges and opportunities specific to the region or city.

It must also be based on the participation and involvement of the local population in the design and implementation of proposals.

In terms of cooperating with and involving the civil society's participation, the GND has the potential to serve as an opportunity and incentive for improvement. Although the typical policy in favor, a feed-in-tariff (FIT), was replaced with the renewable energy portfolio standard (RPS) policy in 2012, the GND includes plans to introduce community benefit-sharing models and increase citizen involvement.

However, for such plans to succeed, it is necessary that the government learns from past failures. One example is the low-carbon green village project introduced in 2008, where some participants dropped out because of spatial limits, lack of technological support or funds, and lack of education, among other reasons.

3. CASE STUDY: INDONESIA

Similar to chapter 2, we discuss the impact of the pandemic on Indonesia's energy transition policies in this section. And aim to answer the following key questions: What is the current energy landscape of Indonesia; how the proposed National Economic Recovery or Pemulihan Ekonomi Nasional (PEN) will, a USD 49 billion fiscal stimulus package impact Indonesia's transition towards clean energy; and what are the opportunities and challenges for leveraging Indonesia's fiscal stimulus to achieve its renewable energy development goals.

3.1 ELECTRICITY DEMAND AND SUPPLY BEFORE AND DURING COVID-19 IN INDONESIA

The COVID-19 pandemic triggered a huge downturn in multiple areas of Indonesia's economy, including the energy sector. Low electricity consumption during the pandemic, the weakening of the rupiah, and Indonesia's coal-dependent electricity supply have created severe financial stress on the state's utilities and grid industry.

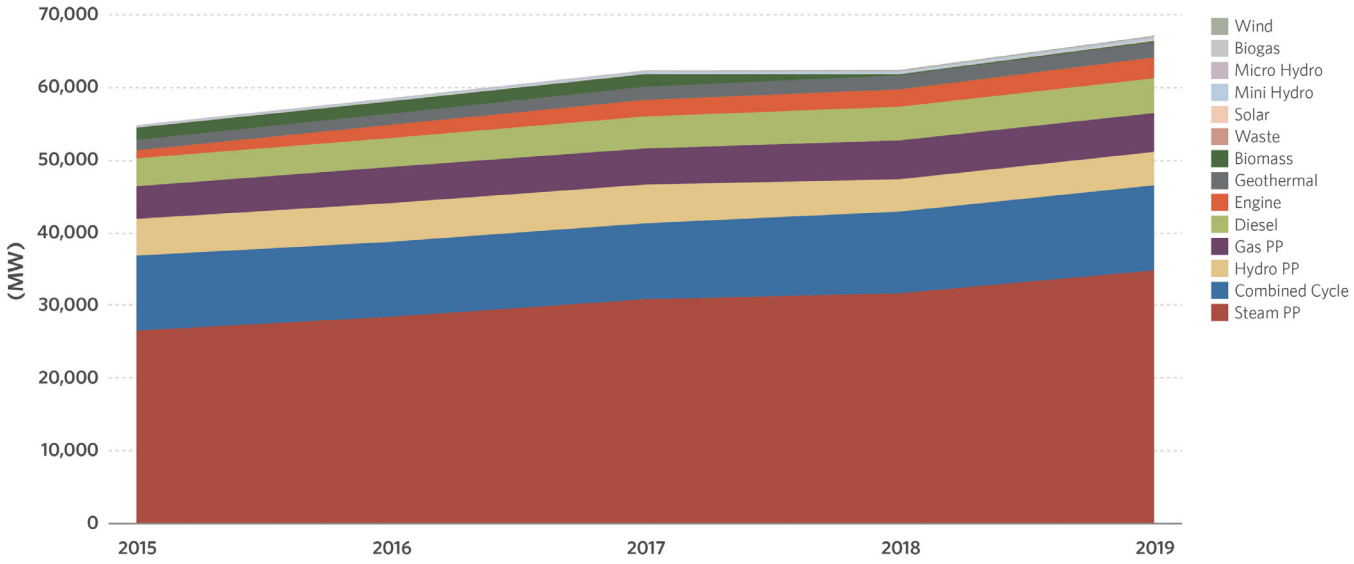
Increasing the renewable energy contribution in Indonesia's energy mix will require policies focused on increasing private sector investments. Indonesia will need approximately USD 16 billion of clean energy investment, or 1.7% of the average annual GDP, to achieve the national renewable energy mix of 31% in 2030.

Understanding the vulnerabilities of coal-based electricity, the Government of Indonesia recently stated its intent to build a more sustainable electricity system as part of its economic recovery efforts.

However, Indonesia's energy infrastructure is not entirely funded by the state budget (APBN) but relies heavily on investments. Therefore, policies focused on enabling investment from the private sector are the key to success. IRENA estimates that Indonesia will require around USD 16 billion of clean energy investment, or 1.7% of the average annual GDP, to achieve the national renewable energy mix of 31% in 2030.

Before the COVID-19 pandemic struck, the annual power generation capacity in Indonesia averaged at 4.15% annually between 2015 and 2019. The installed power plant capacity of the state's power company, Perusahaan Listrik Negara (PLN), was dominated by coal-fired power plants with a total share of 51% or 34 GW in 2019. The total installed capacity for on-grid power generation in 2019 was 67 GW (figure 3.4).

Figure 3.4: Total Electricity installed capacity (MW) from 2015-2019



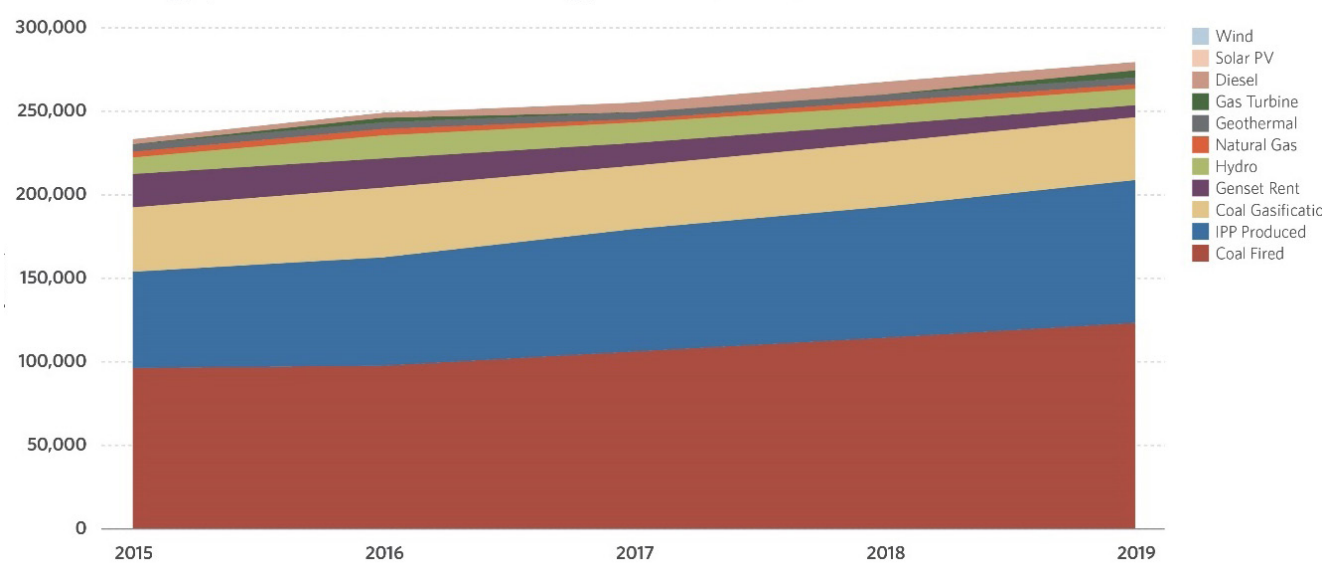
In 2019, the portion of total renewable energy in installed capacity amounted to 11.4%. Of this, large scale hydro and geothermal were the main contributors, totaling 10% of the total installed capacity.

In PLN's long term electricity development plan (RUPTL) for 2019, the government aimed to add 56.6 GW of power generation capacity until 2028 or an average capacity increase of 5.6 GW/year. Of this amount, coal-fired electricity generation is still the major contributor, reaching 27.1 GW or 48% of the total additional capacity target. The installed capacity expansion between 2019-2028 will mainly address the independent power producers (IPP) for 60% of the total capacity. Meanwhile, coal-fired power generation will still be the largest contributor for IPPs, reaching 14.3 GW or around 44%.

In 2021, PLN announced a moratorium on construction of new coal plants as of 2023 to meet PLN's target of net zero by 2050. However, throughout 2020 PLN also needed to take short-term measures to cope with declining demand for electricity and increasing reserve margins (overcapacity).

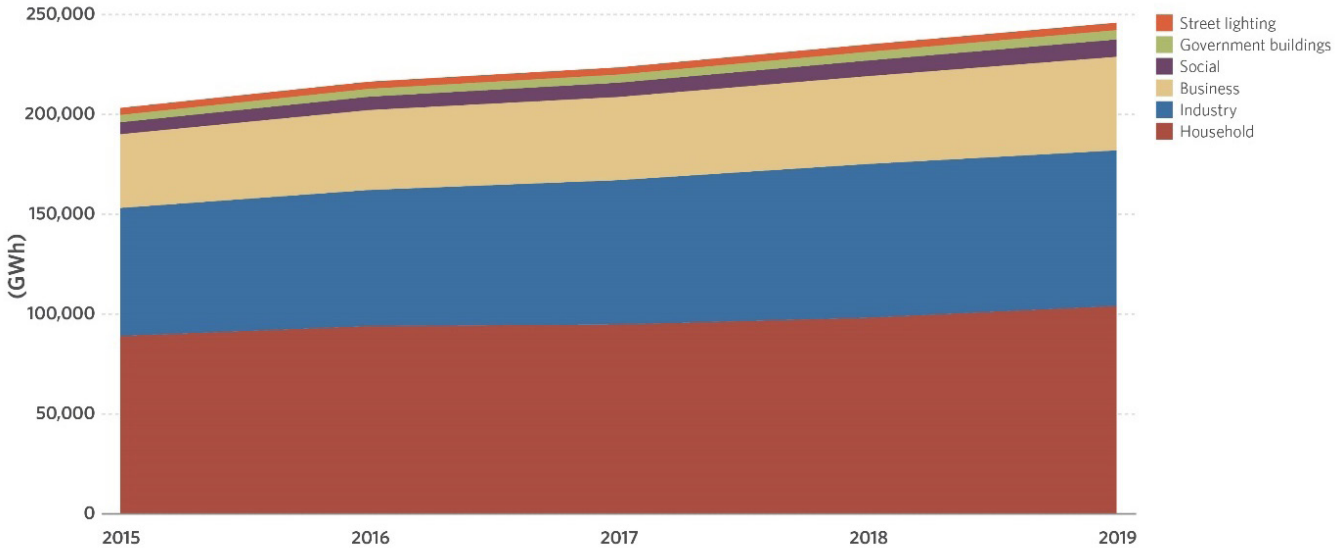
Total electricity production in the pre-COVID-19 era (between 2015 and 2019), grew from 222 TWh to 269 TWh in 2019 showing a steady increase aligning with economic development. Coal-fired power plants still dominate PLN's energy production at 58.2%, while renewable energy accounts for only 8.40%.

Figure 3.5: Energy production based on energy source (GWh) 2015-2019



Total energy consumption in 2019 totaled 245,518 GWh with a compounded annual growth rate (CAGR) of 3.89% from 2015-2019. Household users were the largest group of consumers amounting to 42% of the total consumption, followed by industry with 31% of the total consumption.

Figure 3.6: Energy consumption based on users (GWh) 2015-2019



The breakdown of energy sources above covers only PLN's own power generation. PLN does not openly disclose the breakdown of energy purchased from IPP.

By the time COVID-19 began to spread across the nation, PLN data showed that provinces with business hubs and a strong tourism economy suffered the greatest decline in electricity consumption. Bali was the worst hit, as shown in Table 3.1.

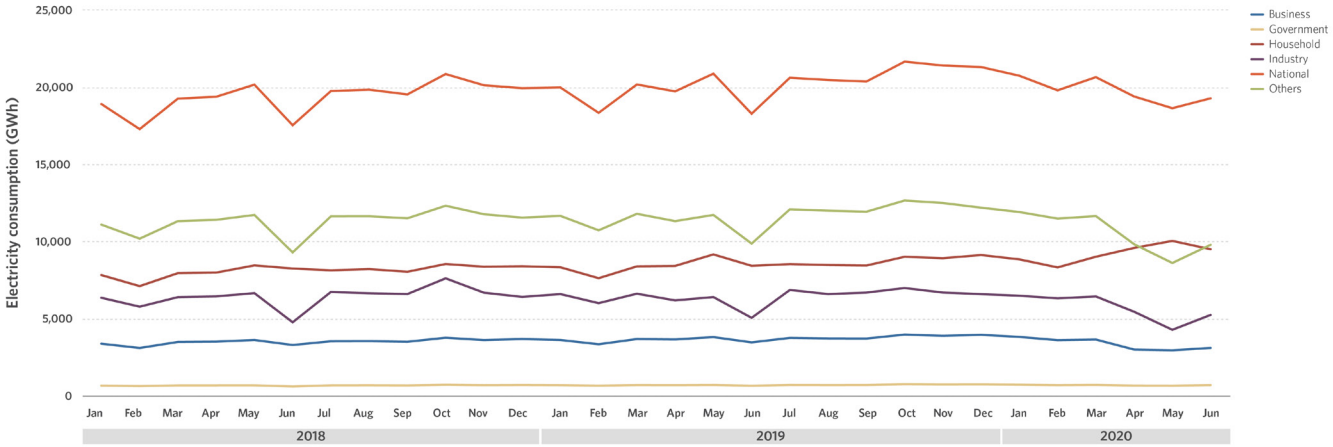
In general, national electricity consumption grew YoY (Jun 2019-2020) by 5.46%, but is projected to decrease (Dec 2020, YoY) by -6.25%. A study of the numbers from January 2020 and June 2020 indicates that national electricity consumption slowed down at -7.06%, with eight service areas experiencing negative growth of more than -5%. This is far from the original 2020 target growth of 6.55%.

Table 3.1: Electricity consumption during COVID-19 by province in Indonesia

Area	Electricity Consumption (GWh)								
	(a) Jun-19	(b) Jan-20	Feb-20	Mar-20	Apr-20	May-20	(c) Jun-20	(a) vs (b)	(b) vs (c)
Aceh	232.00	239.10	224.70	244.20	262.40	252.10	252.40	8.79%	5.56%
North Sumatra	876.10	931.50	897.60	956.50	921.90	906.70	932.50	6.44%	0.11%
West Sumatra	269.50	297.80	273.30	287.20	267.10	281.60	276.60	2.63%	-7.12%
Riau	434.90	488.20	463.90	496.70	474.90	500.50	483.20	11.11%	-1.02%
S2JB	658.30	690.70	658.90	698.30	689.10	693.70	686.80	4.33%	-0.56%
Babel	92.20	98.70	95.30	104.40	99.20	101.20	98.00	6.29%	-0.71%
Lampung	373.80	394.80	378.70	422.50	409.10	417.00	403.60	7.97%	2.23%
West Kalimantan	206.40	221.30	212.00	227.60	230.90	234.30	226.20	9.59%	2.21%
SE Kalimantan	329.80	361.20	348.30	374.40	368.80	379.10	362.90	10.04%	0.47%
East Kalimantan	308.60	349.40	334.50	353.50	347.20	345.20	336.30	8.98%	-3.75%
Sumatra & Kalimantan	**3,781.60**	**4,072.70**	**3,887.20**	**4,165.30**	**4,070.60**	**4,111.40**	**4,058.50**	**7.32%**	**-0.35%**
N&C Sulawesi	279.90	308.70	293.80	312.80	312.40	320.30	309.00	10.40%	0.10%
SE Sulawesi	570.50	632.80	602.60	628.40	613.60	610.50	584.20	2.40%	-7.68%
Maluku	84.00	96.50	92.30	96.70	97.50	98.00	91.80	9.29%	-4.87%
Papua	124.70	140.00	135.60	141.90	138.30	140.70	137.10	9.94%	-2.07%
NTB	155.30	178.50	170.10	177.10	187.70	184.60	177.10	14.04%	-0.78%
NTT	76.60	89.30	87.00	90.60	95.70	93.80	93.40	21.93%	4.59%
Eastern Indonesia	**1,291.00**	**1,445.80**	**1,381.40**	**1,447.50**	**1,445.20**	**1,447.90**	**1,392.60**	**7.87%**	**-3.68%**
Bali	441.40	540.40	484.70	480.30	394.90	389.40	362.80	-17.81%	-32.86%
East Java	2,768.10	3,204.50	3,050.40	3,194.60	3,091.10	2,932.00	3,001.80	8.44%	-6.33%
Central Java	2,107.20	2,399.10	2,270.90	2,366.90	2,302.40	2,156.30	2,248.40	6.70%	-6.28%
West Java	3,663.00	4,322.60	4,139.70	4,298.90	3,856.10	3,621.20	3,865.50	5.53%	-10.57%
Jakarta	2,558.90	2,793.70	2,663.70	2,776.20	2,488.20	2,440.10	2,636.70	3.04%	-5.62%
Banten	1,659.10	1,952.50	1,906.50	1,909.60	1,739.70	1,528.40	1,702.30	2.60%	-12.81%
Bali and Java	**13,197.70**	**15,212.80**	**14,515.90**	**15,026.50**	**13,872.40**	**13,067.40**	**13,817.50**	**4.70%**	**-9.17%**
NATIONAL	**18,270.30**	**20,731.30**	**19,784.50**	**20,639.30**	**19,388.20**	**18,626.70**	**19,268.60**	**5.46%**	**-7.06%**

Household consumption remained the key driver for electricity demand in Indonesia before and during the pandemic. Households showed a growth in electricity consumption for both YoY and the January-June 2020 comparison (12.76% and 7.47% respectively). Commerce on the other hands experienced negative growth on both comparisons (-10.38% and -18.68%).

Figure 3.7: Electricity consumption during COVID-19, by sector, in Indonesia



Future renewable energy projects by the private sector are likely to slow down until the economy recovers.

PLN data showed that the reserve margin for 2020 was above 30%, averaging at 40%. PLN has announced official strategies to mitigate the high reserve margin by rescheduling the commercial operation date (COD) of on-going power plant projects. It also plans to rearrange the connections of existing plants with low utilization rates with other systems to cut down investing into new power plants.

At present, eight developers have asked for projects to be delayed indefinitely due to the pandemic. There are six coal power plants, one gas power plant and one hydro plant project (with a total capacity of 6,510 MW) in the pipeline.

The government also acknowledged this critical problem with PLN's electricity oversupply. The Ministry of SOE released letter no.S-756/MBU/09/2020 to the Ministry of Energy and Mineral Resources (MEMR) and letter no.S-757/MBU/09/2020 to the investment coordination board (BKPM), both authorities in power plant investment.

The letters aim to limit the issuance of captive power permits to push sales by PLN and adjust RUPTL 2020-2028 following a demand shift and PLN's financial capacity.

3.1.1 INDONESIA'S PREEXISTING ENERGY POLICIES AND TARGETS

It is pertinent to understand Indonesia's policy landscape in the context of the pandemic's impact. Indonesia's preexisting policy targets may serve as the baseline to measure the success of fiscal stimulus in getting Indonesia back on track in the aftermath of the pandemic. The same logic can be applied to the country's energy transition policy, which has been significantly affected by the pandemic. This chapter outlines Indonesia's preexisting energy policy and targets that were in place before the pandemic shock in early 2020.

Indonesia has made a climate commitment to reduce its emissions by 29% unconditionally. It also aims to reduce emissions by 41% with international assistance by 2030 (Republic of Indonesia, 2016) as stipulated in the nationally determined contribution (NDC). Meanwhile, in the context of energy transition, the overarching policies are outlined in the national electrification plan (Rencana Umum Ketenagalistrikan—RUKN) and the national energy plan (Rencana Umum Energi Nasional—RUEN), which are equivalent to government regulations.

Indonesia's climate and energy target is an ambitious one. Calculations indicate that the envisaged energy transition target (if all targets are achieved) may exceed the envisaged emission reduction target outlined in the NDC (Climate Action Tracker, 2020). Further, there are several other technical regulations under the NDC, RUEN, and RUKN to be considered. All of these regulations are regularly updated and revised.

Table 3.2: Simplified tabulation of Indonesia's energy transition policies

Indonesia's Nationally Determined Contribution (NDC) 2016	
Climate target	○ 23% of voluntary emission reduction by 2030 ○ 41% of emission reduction
Energy target	○ Increasing the renewable energy mix from 10.5% (2015) to 23% in 2025 ○ Expanding energy conservation measures to 75-100% of energy users in 2025
National Energy Plan (RUEN)	
Energy supply	○ 45.2 gigawatts (GW) of renewable energy capacity to be installed by 2025 to meet the target of 23% of renewable energy
Energy demand	○ 21.9% of energy savings achieved in 2025 compared to the business as usual (BAU) scenario ○ 39% savings achieved in 2050
National Electrification Plan (RUKN)	
Energy supply	○ In the BAU scenario, 22 out of 76 GW renewables will be added by 2025 ○ In the conservation scenario, 17 out of 67 GW renewables will be added by 2025
	○ The KESDM 39/2019, however, issued a lower demand than what was forecasted by the RUKN

In Annexure A, we detail on Indonesia's policy related to energy generation, MoF's fiscal assistance for clean energy generation, and Indonesia's policies related to energy consumption.

3.2 FISCAL STIMULUS IN INDONESIA TO AID ECONOMIC RECOVERY

The COVID-19 pandemic has caused an upheaval in many countries across the globe, and Indonesia is no exception. The world's fourth most populous country has recorded more than 30,000 fatalities as of February 2021. This is also the highest number in Southeast Asia.

The government has deployed stringent measures to get the pandemic under control and has authorized unprecedented stimulus packages to minimize the economic damage as the nation's GDP contracted by -2.19% compared to 2019. As the health system is overwhelmed,

major economic indicators such as FDI, exports, imports, and retail sales show a downward trend.

As the government seeks to forge a path towards economic recovery, it is still trying to balance its short-term crisis relief and economic recovery, along with its long-term development. The government aims to achieve this by juggling policies that give equal support to what is likely to support Indonesia's growth beyond COVID-19, i.e. foreign investment, green projects, and domestic consumption. The Indonesia Planning and Development Agency published recommendations to Build Forward Better, which includes the importance of clean energy for short-term and long-term economic benefits as well as better job creation than conventional energy (Bappenas, 2020), but these have not yet materialized into fiscal action.

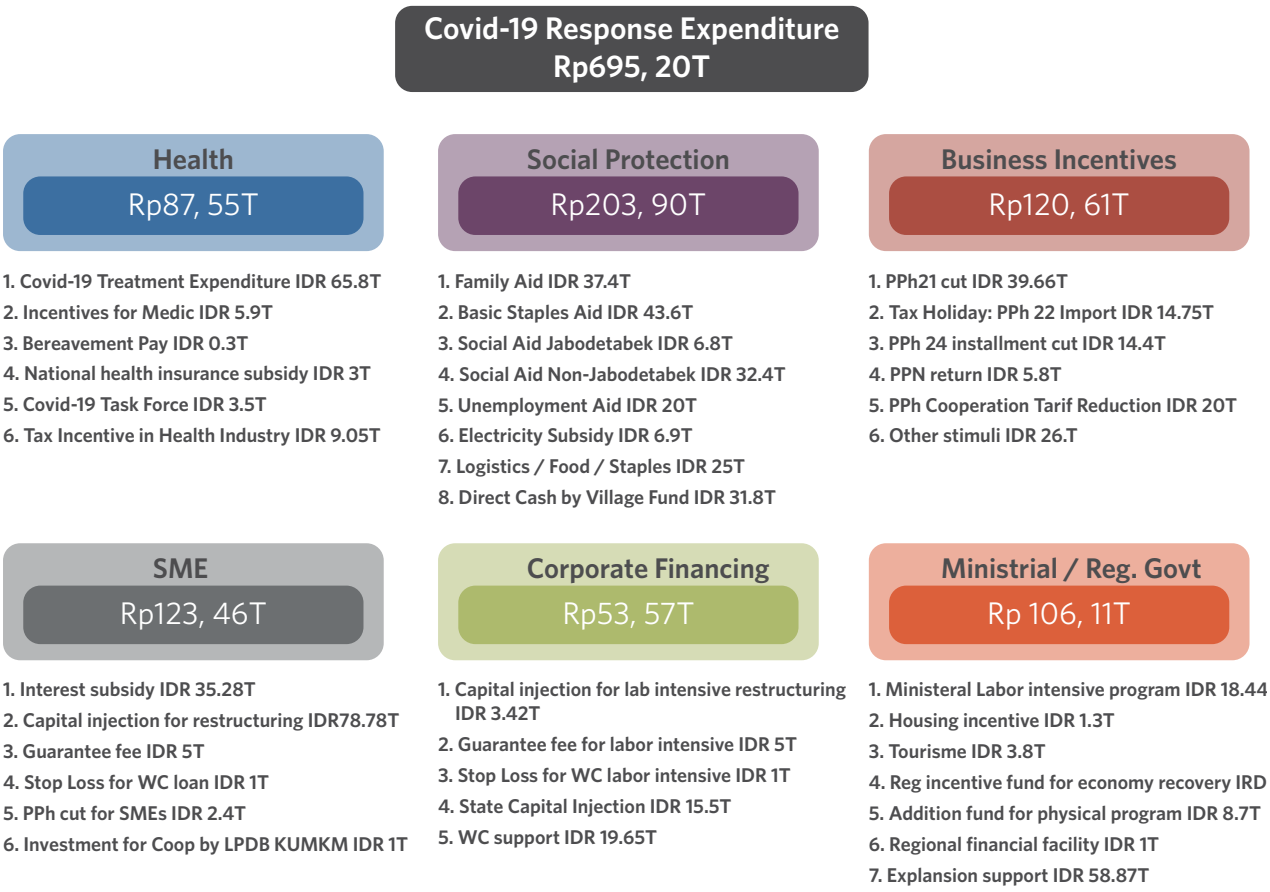
3.2.1 OVERVIEW OF THE NATIONAL FISCAL STIMULUS PACKAGES IN INDONESIA

On May 11, 2020, the Indonesian government issued government regulation no. 23/ 2020 (PP no.23/2020) regarding the implementation of the national economic recovery (PEN) program. The regulation outlines the latest stimulus policies to soften the economic impact caused by the pandemic.

PEN was introduced as an expansion of the incentives in the stimulus packages issued in February and March 2020 amounting to USD 2.27 billion (IDR 33.2 trillion or 0.2% of GDP). Since then, PEN has been constantly refined and the package currently amounts to USD 47.7 billion (IDR 695.2 trillion).

As outlined in figure 3.4, these fiscal packages comprise six main expenditure streams where a large portion of PEN in 2020 is dedicated to social protection and fiscal incentives for different sectors of business.

Figure 3.8: Breakdown of Indonesia's PEN in 2020



Since then, regulation PP no. 23/2020 has been amended by PP no. 43/2020, which streamlines the President's policy with the regulations issued by his ministers since the announcement of the PEN program.

These include the appointment of state-owned PT Sarana Multi Infrastruktur to distribute PEN loans to regions, and the Indonesia export financing institution, and PT Penjaminan Infrastruktur Indonesia to execute the government's loan guarantee program. The regulation also gives the President's ministers and regional governments greater authority in executing and disburse the PEN money as they see fit to quickly bounce back the economy at national and/or regional level.

3.2.2 PEN'S FISCAL STIMULUS FOR ENERGY TRANSITION OBJECTIVE IN INDONESIA

Economic stability and financial liquidity are the main concerns addressed by this fiscal stimulus program. Green recovery as a target, and especially energy transition, was never explicitly mentioned in the document. However, CPI has identified several specific allocations related to energy transition programs by the government and its agency, which covers 0.9% of the whole PEN.

1. **PLN:** The state capital injection (PMN) of USD 0.34 billion (IDR 5 trillion) to the PLN was formalized by PP no. 37/2020 on July 7, 2020. As requested by the Ministry of Finance (MoF), USD 0.07 billion (IDR 1 trillion) of PMN will be allocated towards renewable energy development of 99 MW, with a total investment of USD 0.21 billion (IDR 3.5 trillion). This consists of 151 PV in Papua (total capacity of 5.82 MW), 24 PV in East Nusa Tenggara (total capacity of 5.35 MW), and hydropower plant Peusangan 1-2 (87 MW) in Aceh. PLN will also use USD 0.013 billion (IDR 200 billion) from the PMN to develop village electricity distribution in Kalimantan (total investment of USD 0.08 billion/ IDR 1.1 trillion).
2. **Pertamina:** The state budget subsidy (APBN) for B30 biodiesel amounting to USD 0.19 billion (IDR 2.78 trillion) has already been allocated.
3. Other government programs for economic recovery may also open up the potential for energy transition program implementation, although this was not specified by the MoF.
    - APBN to ministries: Four ministries have been assigned to create labor-intensive programs (USD 1.26 billion or IDR 18.4 trillion, current estimation) to provide temporary work for daily workers affected by COVID-19.
    - APBN and SMI's concessional loan to the regional government to push economic recovery in affected regions.

The allocation mentioned in point (3) above can be used to fund government-sponsored energy-related projects. These include village irrigation projects integrated with mini-hydropower plants and last-mile renewable energy development, biogas projects, energy efficiency projects in regional areas, and other clean energy development projects. Although unspecified, PEN still has the potential to leverage private players in the energy market in Indonesia.

In general, PEN-funded allocations are flexible depending on the activities planned by the entities assigned by the government. There is fiscal room to impact energy transition in Indonesia both directly and indirectly. Figure 3.9 highlights the allocation from PEN towards the demand and supply side of energy in Indonesia that can be utilized by the public and private sectors.

Figure 3.9: PEN 2020 allocation to the demand and supply sides

Demand side / **IDR 205.2T**		
Social Protection		
Family protection, basic staple needs, social aid, unemployment aid, electricity aid, direct cash aid	IDR	203.9T
Low-income housing incentive	**IDR**	**1.3T**

Supply side / **IDR 384.45T**		Public / Private
Interest subsidy	IDR	35.2T
Capital injection for labor intensive SME (IDR 78.7T) and labor intensive(IDR 3.42T)	IDR	82.2T
Guarantee fee subsidy (IDR 10T) and additional allocation (IDR 2T)	IDR	12.0T
State capital injection	IDR	15.5T
Working capital grant	IDR	19.65T
Tax incentive	IDR	123.01T
Regional government support	IDR	14.7T
Support for tourism	IDR	3.8T
Ministerial labor-intensive program	IDR	18.44T
Investment in cooperatives through LBDB KUMKM	IDR	1.0T
Additional expansion budget	IDR	18.44T

On the demand side, PEN's priority is to limit the supply-demand gap from growing larger, by providing electricity bill subsidies (direct impact) and incentives to support the people's purchasing power (indirect impact).

On the supply side, PEN allows flexibility for energy companies and corporates to restructure credit to maintain the liquidity and financial health of companies.

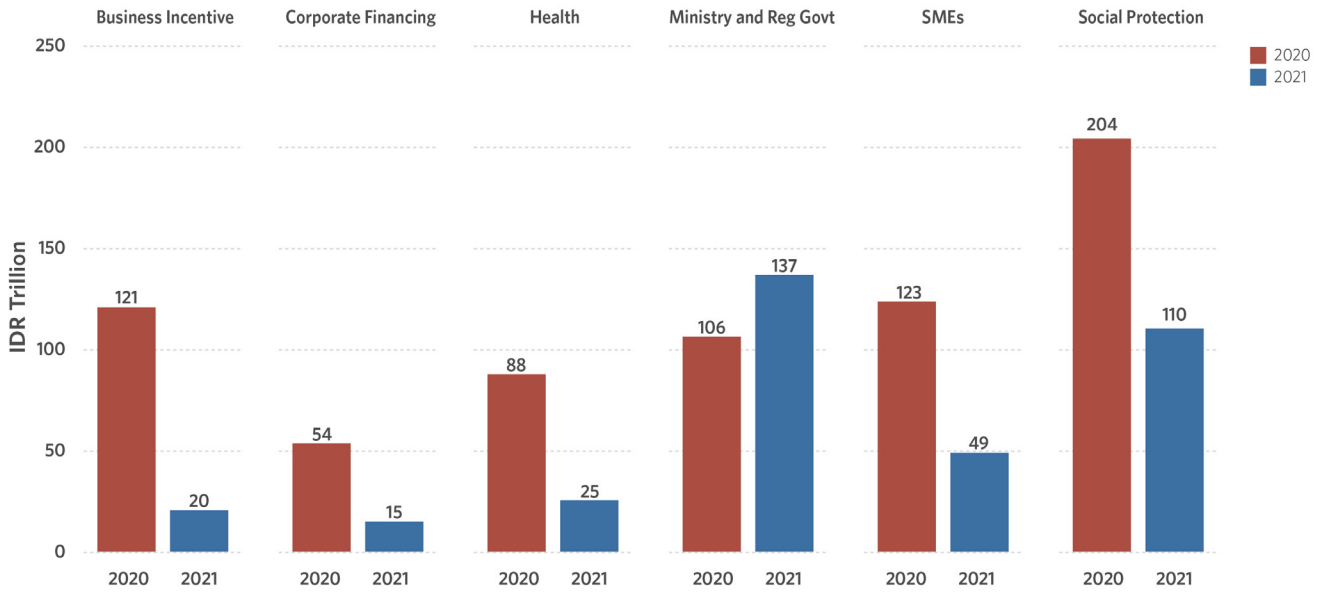
Box 1: The use of PEN for energy transition is driven by community and private sector

The flexibility of PEN's allocation is considered by civil society organizations (CSOs) and corporations as an opportunity to propose energy transition programs that are in line with the PLN's or national electricity development plan and financeable by PEN. Some of the ideas proposed under the PEN's umbrella are:

- Adoption of Program Surya Nusantara by the MEMR as part of the ministerial program funded by PEN. This can lead to a potential electricity reduction of USD 0.05-0.09 billion (IDR 0.8-1.3 trillion), absorb 78,000 direct and indirect laborers, reduce 105 million tons of carbon per gigawatt peak on NDC, and support the local PV industry.
- Development of community forests to support PLN's plan to increase its biomass cofiring portion into the electricity mix.
- Incentivizing new small businesses to support EV (electric vehicle) down streaming. The EV battery swap business model is an example.

For 2021, the government announced plans to extend the economic recovery stimulus. The looming uncertainty caused by the ongoing pandemic has pushed the national government to revise and readjust the 2021 PEN budget multiple times with the latest figure at USD 43 billion (IDR 627.93 trillion) or 9.6% less than the 2020 budget[3].

Figure 3.10: Program allocation comparison between PEN 2020 and 2021



As shown in the graph above, ministry-regional government programs and social protection are the main priority in 2021. The priority programs carried out by ministries or agencies, and regional governments, are intended to stimulate the economy and are particularly relevant to tourism and labor-intensive industries that are vulnerable to the impact of a pandemic.

On the other hand, the budget for business and tax incentive programs has declined by 15.7%, and these programs received the smallest portion with an allocation of USD 2.89 billion (IDR 47.27 trillion). This may not be helpful for small renewable energy businesses and services that still struggle with cashflow and require greater fiscal incentives to bounce back.

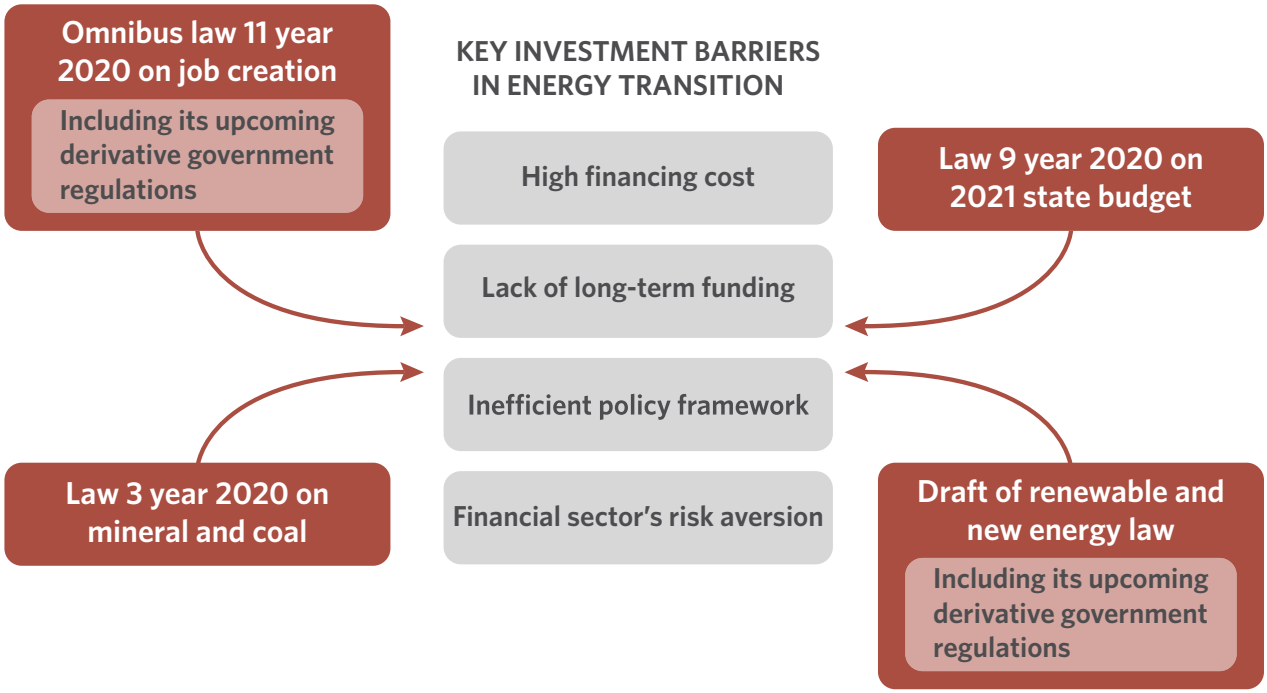
3.2.3 EXPLORATION OF CLEAN ENERGY TRANSITION POLICIES OTHER THAN COVID-19 ECONOMIC RECOVERY

Other than the policies available on the PEN package that are relevant to the pandemic, this study also focuses on reviewing upcoming policies that can potentially affect clean energy investment in Indonesia.

Unlike PEN, these upcoming policies may be designed to last beyond the COVID-19 economic recovery period. Therefore, in addition to PEN, an analysis of the new policies is also pertinent as these policies will have long-term effects after the economy recovers from the pandemic.

3 Data as of February 9th 2021

Figure 3.11: Key upcoming policies that will impact existing investment barriers to energy transition



Four new regulations that are significant to Indonesia's energy transition agenda are assessed in this study.

1. Law 11 year 2020 on omnibus law on job creation (UU Omnibus) relaxes several regulations related to business licensing to spur private investment in Indonesia. This includes business investment in the energy sector.
2. Law 3 year 2020 on mineral and coal (UU Minerba) regulates fossil-based coal energy, a substitute for renewables.
3. Draft law on renewable and new energy regulates matters related to licensing, incentives, and technical direction on renewable and new energy generation.
4. The state budget 2021, which is revised annually, will reflect the future economic focus of the Government of Indonesia after the pandemic.

These new regulations include clauses that will affect the landscape of energy transition in Indonesia. The clauses are grouped into non-fiscal instruments, which concern business licensing processes, and fiscal instruments, which concern incentive mechanisms for private investment.

Figure 3.12: Effects of the upcoming regulation on energy transition beyond the fiscal stimulus in Indonesia

	Non-fiscal instrument	Fiscal instrument
Omnibus law on job creation	**Business Licensing Process:** simplification of investment requirements, risk-based approach on business licensing **Environmental protection & forestry:** business & environmental permits, sanctions **Power generation:** mandatory local content requirements	**Mining:** 0% royalties for coal mining **Geothermal:** no requirement on production royalty **Investment:** exclusion of dividend from income tax (Pph) and adjustment of tax interest
Mineral and coal law	**Permits:** centralization of authority on permit issuance, expansion of exploration site, operational permit extension guarantee **Investment:** obligation on foreign-stake divestment	**Fund:** establishment of the exploration fund **Tax:** tax incentive on coal **Incentive:** fiscal / non-fiscal incentive for downstream industry develepment
2021 state budget (law 9 year 2020)	**Permits:** the exclusion of renewable energy in the development priority **Electricity:** additional equity injection to the state electricity company, stricter requirement for electricity subsidy beneficiaries	**Fund:** Sovereign Wealth Fund (SWF) **Geothermal:** risj-sharing through grant from the state-owned company **Special allocation fund (DAK):** infrastructure and thematic DAK will remain available for provinces
Draft renewable/ new energy law	**Reneable energy:** local content requirements, centralization of authority for procurement, state-own electricity company requirement to purchase the power generated **New energy:** local content requirements, centralization of authority for procurement	**Renewable energy:** RE Feed-in-Tariff, subsidy / compensation, fiscal / non-fiscal incentives, blended biofuel pricing, renewable energy fund

3.3 ROLE OF FISCAL STIMULUS AND NEW ENERGY POLICIES TO ADDRESS CHALLENGES AND OPPORTUNITIES FOR ENERGY TRANSITION IN INDONESIA

To achieve Indonesia's energy transition targets, the most critical step is to leverage the current fiscal stimulus packages and the new RE-related policies to promote a faster energy transition. In this context, private investment in renewable energy is an important requirement and financial barriers continue to be the biggest hurdle for the private sector to invest in RE (IRENA, 2017 and ACE, 2017).

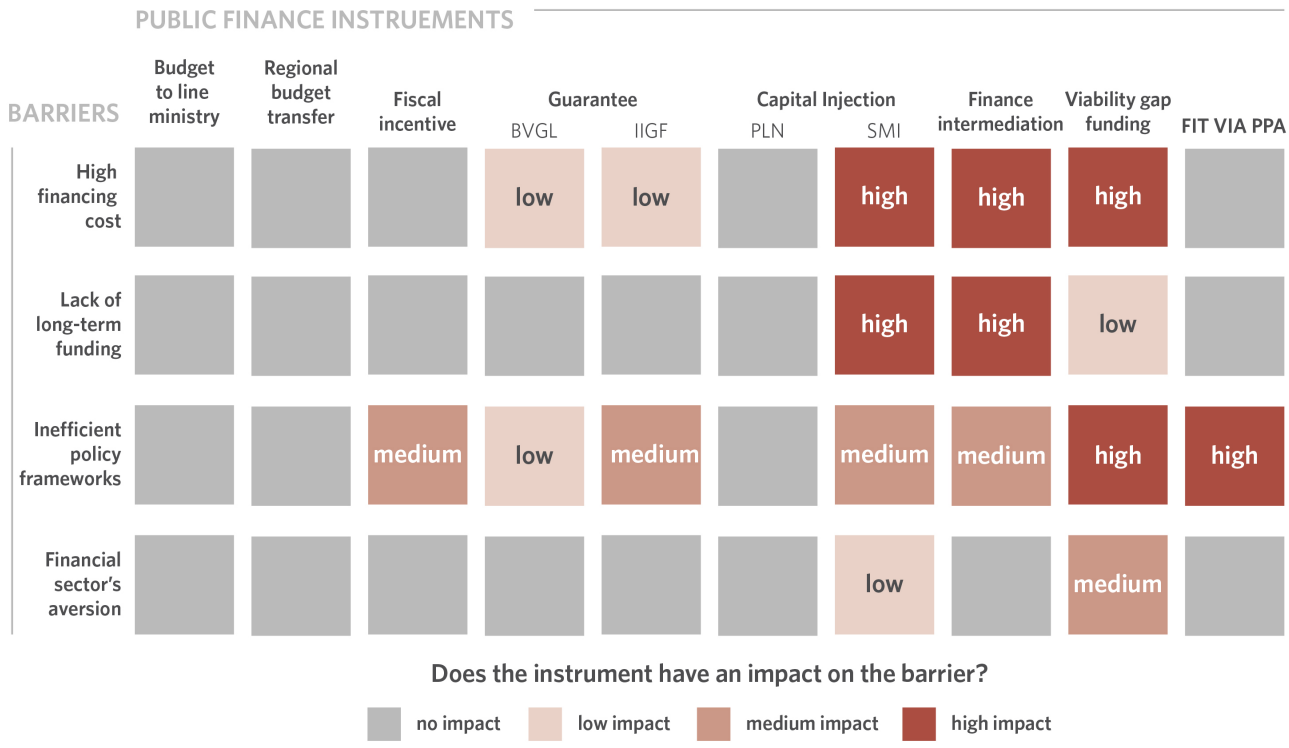
Therefore, the fiscal stimulus program planned by the Indonesian government must be able to attract private investment in clean energy by eliminating the barriers that pose a hurdle to private investment.

The four main barriers to private investment in clean energy in Indonesia (Sitorus et al., 2018) are:

1. **High financing cost:** Indonesia's persistently high interest rates pose a significant challenge for developers looking to raise funds to meet their target financial returns.
2. **Limited long-term debt funding:** Structural problems in Indonesia's financial system make it difficult to raise much-needed long-term debt finance for clean energy development.
3. **Inefficient policy frameworks skewing the risk-return profile:** Inefficient tariff design skews the risk-return profile of clean energy projects, and this makes it challenging to put together a bankable project.
4. **Financial sector's risk aversion:** The local financial sector's inexperience with the clean energy sector and its reluctance to provide funding in a project finance scheme may increase the perception of risk when developing clean energy projects.

The following figure outlines the ability of the existing public finance instruments to absorb these investment barriers. In the context of this study, the analysis of public finance will expound on the role of fiscal stimulus policies and how other relevant policies may affect the four barriers to private investment.

Figure 3.16: Example of public finance absorbing existing investment barriers (CPI, 2018)



In the table below, we have also outlined the top nine challenges with regards to PEN and four upcoming regulations that will impact the existing investment barriers to the energy transition.

Table 3.3: Key issues for renewable energy development in Indonesia

General RE development issues	Decentralized RE issues	COVID-19 specific issues
1. High financing costs 2. Limited long-term debt funding 3. Inefficient policy frameworks skewing risk return profile 4. Financial sector's risk aversion	5. DRE projects are unattractive for private investment 6. The lack of access to innovative financial instruments 7. The lack of financial instruments for financial or project risk mitigation	8. Lack of RE demand 9. Cash flow problem for RE operator/ developer *Only for PEN

3.3.1 BARRIERS TO INVESTMENT FOR THE CLEAN ENERGY TRANSITION IN INDONESIA

3.3.1.1 MAJORITY REQUIREMENT OF LOCAL MATERIALS IN PROJECTS AND THE STRONG POSITION OF COAL MAKES RENEWABLE INVESTMENT NON-COMPETITIVE AGAINST COAL INVESTMENT

Under the Omnibus Law and the Draft Law of RE, the majority of the materials used in any project have to be locally produced. This could potentially lower project bankability because local materials are generally more expensive despite lower quality and durability.

The current strong position of coal in the energy mix, backed by favorable policies also weakens the case for renewable energy investment. The coal-related measures created in the new Law of Mineral and Mining; from the obligation of annual new reserves exploration and allocation of exploration fund, provision of tax incentives, provision of incentives for downstream industries development, erasure of coal production royalties to operational permits extension guarantee; will practically provide long-term legal and investment certainty for coal investors while accommodating the interests of coal giants in Indonesia. This is especially threatening for renewable energy.

3.3.1.2 LONG-TERM DEBT FUNDING FOR RENEWABLE ENERGY INVESTMENT IS LIMITED

PEN's main focus is to maintain the liquidity of economic actors by providing short term subsidies. It has zero to limited influence on the structural problems in Indonesia's financial system that makes it difficult to raise the much-needed long-term debt finance for clean energy development.

The latest draft law of RE still does not specify appropriate methods to address the lack of long-term funding. Although the Omnibus Law does mention the establishment of Government Investment (popularly known as Sovereign Wealth Fund or SWF) which might increase government investments in green projects. This would encourage private entities to invest as they will feel more secure. However, the impact of this SWF on securing more long-term funding from the private sector is yet to be proven.

3.3.1.3 LACK OF SPECIFIC POLICIES TO MAKE RENEWABLE ENERGY INVESTMENT MORE ATTRACTIVE

PEN does not include policy frameworks that make the national RE risk return profile more attractive to investors. Meaning, there is no change in tariff design in PEN to help RE projects become more bankable.

The State Budget 2021 (Law no.9/2020) also did not include RE investments in the list of national development priorities for 2021. The government is only predisposed to prioritize economic recovery, health, tourism, and social security. This could potentially draw a negative picture for investors as it implies that Indonesia's economic recovery might not be driven by clean energy provision and may indicate that the government will not go the extra mile to help clean energy projects to have a competitive edge against their fossil fuel alternatives.

The Omnibus Law seeks to decrease the complex legal processes for business through (1) centralization of licensing process and introduction of a risk-based licensing; (2) centralized central planning for spatial planning; (3) centralization of environmental permits and assessment; and (4) relaxation of the negative investment list for foreign investment. However, we are yet to see if the implementation of this centralized system will adversely or favorably affect the cost in certain sectors, including RE, and thus affecting the attractiveness of private investment in this industry.

3.3.1.4 PEN IS UNABLE TO ADDRESS THE FINANCIAL CHALLENGES IN DECENTRALIZED RENEWABLE ENERGY PROJECTS

The geographic conditions and uneven demand distribution create significant challenges in providing electricity to thousands of islands and remote areas in Indonesia. Therefore, an off-grid or decentralized electricity generation model is the best choice to electrify these underdeveloped areas. A decentralized renewable energy (DRE) system offers greater advantages to accelerate the electrification rate as it uses locally available energy sources.

However, private investment interest in DRE has been absent due to three perceived financial barriers: DRE projects considered unattractive for private investment, the lack of access to innovative financial instruments, and the lack of financial instruments for financial or project risk mitigation (CPI, 2020)

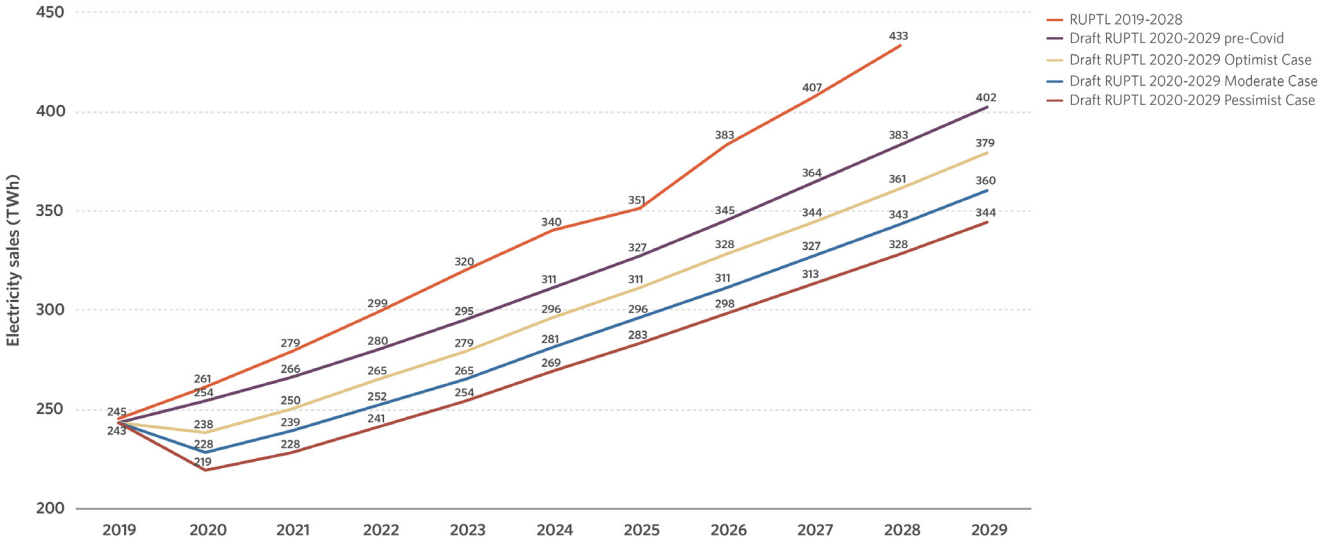
CPI has tried to analyze the effectiveness of PEN in addressing these barriers, given the scale and allocation of PEN fiscal stimulus that fits the profile of many decentralized renewable energy (DRE) projects. Regional governments are one of the major disbursers of PEN and they have been given a wide range of flexibility to utilize PEN for infrastructure projects that can boost the local economy as they see fit, including DRE for communities in remote areas.

However, so far PEN has not been able to respond effectively to these barriers. The certainty of a DRE business model can positively affect its attractiveness, which in turn provides access to different sources of available financing. In this context, the PEN neither has a specific allocation that can be directly utilized to improve a DRE project's return profile, nor a dedicated de-risking instrument that can mitigate the inherent risk of a DRE project.

3.3.1.5 READJUSTMENT OF PLN'S LONG-TERM BUSINESS PLAN DUE TO COVID-19 STILL INCLUDES A HEAVY MIXTURE OF COAL GENERATION, ALBEIT LABELED AS CLEANER COAL

Following the decreasing demand for electricity and the economic recession in 2020, PLN has decided to readjust its RUPTL 2020-2029, with significant corrections to its sales and capacity projection. PLN has modelled three RUPTL scenarios with three different yearly targets to encourage sales recovery, i.e., optimistic scenario for 2021, moderate scenario for 2022 and a pessimistic scenario for 2023. For reference, the economic growth is assumed at 4.35% in 2021 in a pessimistic scenario.

Figure 3.13: RUPTL scenario for 2020-2029

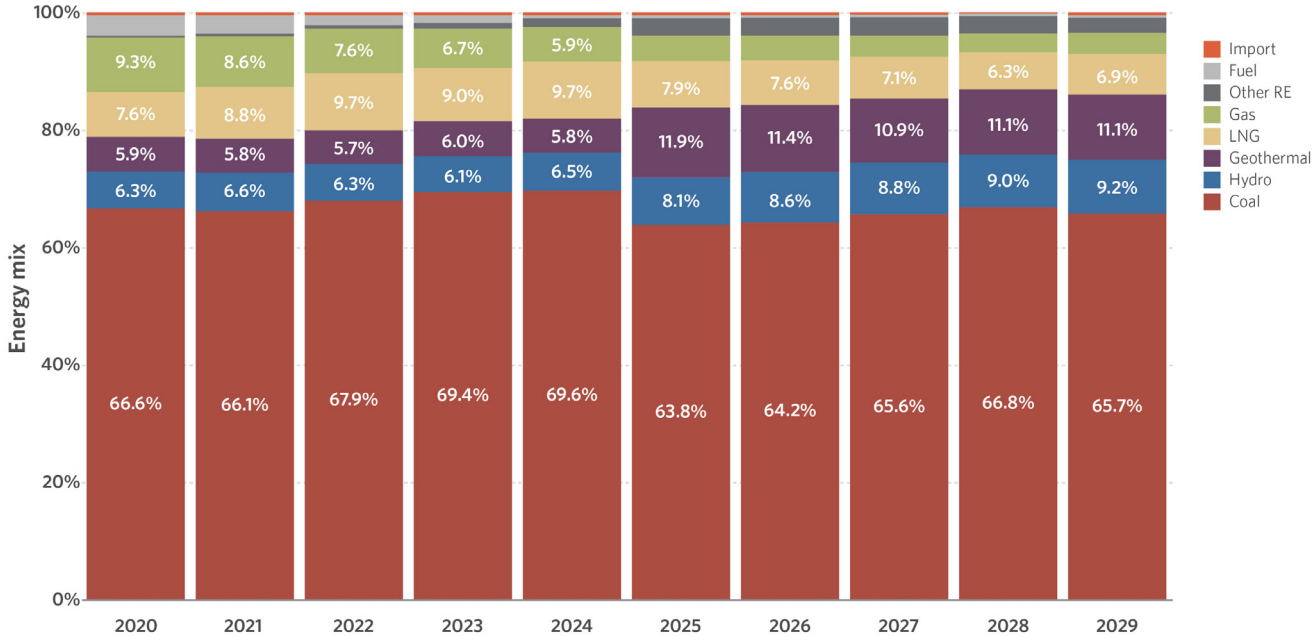


In this long-term plan, cleaner coal powered plants remain a significant part of the electricity generation mix. PLN is depending on geothermal energy to achieve its 23% renewable electricity (RE) production target for 2025. PLN's strategy for this target, as mentioned in the RUPTL, and its challenges are:

- The use of biomass to replace 10% of coal by integrating cofiring and/or waste to energy (WtE) technology. This will cover a total capacity of 790 MW of electricity from cofiring/WtE and will reduce 4.2 million tons of coal every year. However, at the moment, only 5% biomass mix is possible at PLN's coal power plant.
- Acceleration of PLTP and PLTA development at 2.234 MW capacity. However, geothermal economic electricity price at USD 0.10-0.12/kWh is not in line with the selling price specified in MEMR's regulation no. 50/2017 to PLN. Average coal plant electricity is priced at USD 0.07-0.09/kWh in the market.

- If the 1,000 MW geothermal plant development is delayed, PLN will develop in its place, a 4,000 MW PV plant or 1000 MW cofiring plant (which will replace 6 million tons of coal per year). However, PV's intermittency and battery price are challenges that may not allow it to fully replace geothermal energy.

Figure 3.14: Energy mix plan (%) in PLN's RUPTL 2020-2029



3.3.2 EMERGING OPPORTUNITIES FROM PEN AND OTHER SUPPORTING POLICIES IN INDONESIA

3.3.2.1 RE FINANCING COST CAN BE LOWERED THROUGH BUSINESS EASING AND FISCAL INSTRUMENTS

Currently, PEN has no specific facilities for RE investment financing. However, a total of USD 8.6 billion (IDR 123,46 trillion) has been allocated for SME and cooperatives financing in 2020, which is also accessible for SMEs in the renewable energy sector.

The Omnibus Law has stipulated several measures (including the erasure of general capital requirement for companies, streamlined licensing, tiered administrative sanctions as opposed to heavier sanctions) that may ease the cost of investment and business in general.

In addition to that, the Draft Law of RE is including the feed-in-tariff (FIT) that will consider a fair return on investment for business entities at no less than 4%, above the applicable commercial interest rate. The government will also have to provide subsidy/compensation if the renewable energy tariff exceeds local PLN generation cost (BPP). The draft law will also establish Renewable Energy Fund, earmarked to provide incentives for renewable energy-related projects. These specific fiscal incentives will directly improve the risk-return profile of RE pipelines and pushing down the financing cost for such projects.

3.3.2.2 TAX CUTS AND THE MANDATORY PURCHASE OF RENEWABLE ENERGY BY PLN WILL BOOST THE CONFIDENCE OF THE FINANCIAL SECTOR IN THE CLEAN ENERGY INDUSTRY

PEN has no specific funding or program for financial institutions to avail RE financing and initiate capacity building. Such programs can help to familiarize and create confidence towards RE project pipelines among lenders. However, PEN offers guarantee instruments (USD 350 million or IDR 5T) to corporations, including renewable energy developers, that can be used to cover 80% of the Non-Performing Loan (NPL) of these companies. This is an opportunity to bring reassurance to lenders and in turn, keep the RE developers afloat through the uncertain pandemic.

For the long run, the Omnibus Law has stipulated several fiscal measures to boost the confidence of financiers towards RE investment which include: (1) erasure of capital gains tax; (2) adjustment of interest tax; and (3) erasure of royalties for geothermal production. The upcoming RE Law also mentions the mandatory purchase of RE electricity by PLN which could reduce the off-taker uncertainty and will be welcomed by the financial industry. IPPs will also be required to meet the Renewable Energy Portfolio Standards (REPS) or they could purchase a Renewable Energy Certificate (REC) as an alternative. All these upcoming measures will make the renewable energy sector much more attractive to the financial industry leading to more private RE investment in Indonesia.

The illustration below summarizes how the four upcoming regulations impact the top four existing investment barriers to energy transition in Indonesia. In general, simplification of business processes and new fiscal measures for selected industries would boost investor confidence and could potentially lead to competitive financing costs for RE projects.

However, leaving out clean energy development in the 2021 priority list may significantly delay any on-going positive changes to the currently ineffective policy framework that keeps RE projects unbankable. These policies also brings no immediate solution towards the structural problems in Indonesia's financial system that makes it hard to access long-term debt finance for clean energy development.

Table 3.4: Potential impact of new regulations on existing barriers to energy transition

Recently issued regulations / Barriers to investment	Omnibus law on job creation	New and renewable energy draft law	Mineral resources and coal law	2021 state budget plan
High financing cost	Neutral	Positive impact	N/A	Positive impact
Lack of long-term funding	Neutral	N/A	N/A	Neutral
Inefficient policy framework	Neutral	Neutral	N/A	Negative impact
Financial sector's aversion	Positive impact	Positive impact	Negative impact	Neutral

3.3.2.3 PEN IS PROVEN EFFECTIVE IN FIXING SHORT-TERM ISSUES CAUSED AS A DIRECT IMPACT OF COVID-19

The pandemic has trigged problems like lack of electricity demand due to reduced power to purchase and cashflow problems experienced by power producers and developers that have also heavily impacted the renewable energy sector. This is because PEN's main focus is to provide fiscal patches to immediately stop events that could lead to an economic downturn. Direct subsidies on electricity help maintain levels of electricity consumption. PLN has calculated that USD 763 trillion (IDR 11,02 trillion) will be disbursed in the form of this subsidy.

PEN provides another financial support in the form of microcredit interest subsidy for SMEs. It covers existing loans drafting up to USD 686,000 (IDR 10 billion), with a duration of 6 months and an interest subsidy rate ot 2-6%/month. This facility is disbursed by almost 2,000 financial institutions and can serve as quick solution for small power companies that are facing cashflow problem due to COVID-19.

Table 3.5, summarizes the potential of PEN in the context of both, energy transition and economic recovery targets. It also recaps the components of PEN that can be used to address four main financial barriers in private RE investment, three barriers specific to DRE private investment, and two barriers specific to COVID-19 impact.

Table 3.5: Assessment of PEN's impact in addressing RE financial barriers

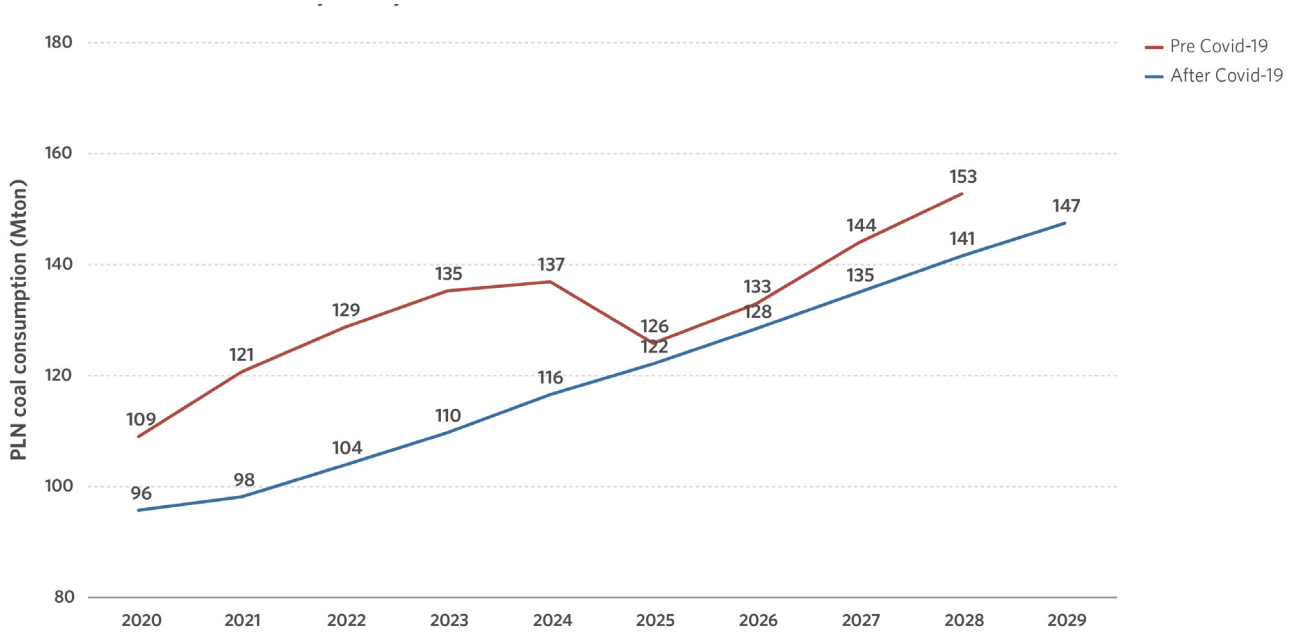
Barrier	Impact Assessment	How the policy can leverage the opportunity
High financing cost	**Positive**	Total available financing for SMEs and cooperatives amounts to IDR 123,46 trillion in 2020.
Limited long-term debt funding	**N/A**	PEN's main focus is to maintain the liquidity of economic actors by providing short term subsidies. It has zero to limited influence on the structural problems in Indonesia's financial system that make it difficult to raise the much-needed long-term debt finance for clean energy development.
Inefficient policy	**N/A**	No specific program to develop greater RE-supportive policy frameworks that can help the national RE risk return profile. No change in tariff design to help RE projects become more bankable.
FI aversion	**Positive**	No specific funding or program for financial institutions to avail RE financing and initiate capacity building. Such programs can help increase lender familiarity and confidence towards RE project pipelines. However, PEN offers guarantee instruments (IDR 5T) to corporations that can cover 80% of NPL.
Unattractive DRE	**N/A**	The certainty of a business model can positively affect the attractiveness of DRE projects. Financing availability normally follows if the business model can demonstrate good risk mitigation and a convincing return profile.
Access to innovative finance	**N/A**	The certainty of a business model can positively affect the attractiveness of DRE projects. Financing availability normally follows if the business model can demonstrate good risk mitigation and a convincing return profile.
Instrument for risk mitigation	**N/A**	DRE risks can be mitigated at its inception by the business model. At the moment there is no dedicated instrument that can mitigate the risk.
Lack of RE demand	**Positive**	Direct electricity subsidy help maintain levels of electricity consumption. PLN calculated a need for USD 763 million (IDR 11,02 trillion) of financial support for this subsidy.
Cashflow problem	**Positive**	Subsidy for SMEs for KUR or non-KUR, with existing loan drafting up to USD 686,000 (IDR 10 billion), for 6 months with interest subsidy rate at 2-6%/ month. This is disbursed by 102 banks, 1570 BPR, 176 BPRS and 110 leasing companies.

3.3.2.4 COVID-19 HAS ACCELERATED THE DIVERSIFICATION OF GLOBAL FOSSIL FUEL INDUSTRY'S PORTFOLIO IN CLEANER ENERGY ASSETS

Despite slow growth expectations for renewable energy in the near future, at the global market level, the pandemic has created an unexpected opportunity for RE development.

Global fossil industry players have been shifting their portfolios to RE in recent years, and COVID-19 has accelerated the process. China and India have paused coal imports from Indonesia. PLN is likely to slow down its future yearly coal consumption due to market uncertainties and achieve its 2025 RE target.

Figure 3.15: PLN coal consumption plan 2020-2028



In the oil and gas industry, weak oil prices have been compounded by the mobility freeze due to COVID-19. Even in its most optimistic recovery scenario, the global O&G industry is required to significantly restructure businesses by acquiring a larger energy transition portfolio. Pertamina is also taking the same path by accelerating its PEN-funded biodiesel program.

In terms of primary energy transition from fossil fuels to electricity, the government of Indonesia recently issued new regulations that strongly support the development of the electrical vehicle (EV) downstream industry and market in Indonesia. This will form a part of its economic recovery efforts in the post-COVID-19 world.

The private sector has so far committed an investment of USD 3.7 billion to EV-related infrastructure over the next five years. There is a big push for more electrification on PLN's demand side, and it has been rolling out its nationwide campaign on the switch towards electricity appliances and modes of transport.

The upcoming new regulations are likely to affect Indonesia's energy transition target more permanently in the future than fiscal stimulus policies (PEN). These policies are effective only during the pandemic shock, and the following 1-5 years of economic recovery. The new regulations may affect the existing barriers to investment to different degrees as outlined in table 3.4.

4. CONCLUSION

For many years, energy policies in South Korea and Indonesia were focused on the affordable and stable supply of power to support economic growth. As a result, the energy mix in power generation is heavily driven by fossil fuels. Both countries now aim to turn the tides and boost the transition to renewables. South Korea, through the Renewable Energy Implementation Plan released by the Ministry of Trade, Industry and Energy (MoTIE) in December 2017, plans to increase the share of new and renewable energy from 7.6% in 2017 to 20% in 2030 and generation capacity from 15.1GW to 63.8GW. Indonesia aims to increase the renewable energy mix from 10.5% (2015) to 23% in 2025 and 30% in 2050.

However, the COVID-19 pandemic has led to dramatic economic loss for South Korea and Indonesia. Both countries implemented some measures to counter the negative impact of the COVID-19 pandemic through new policies, including disbursement of fiscal stimulus. The level of government spending pursued by both governments is a rare opportunity to significantly advance the energy transition agenda in South Korea and Indonesia while simultaneously creating jobs and boosting each economy, but this will only occur if the proper frameworks and policies are created quickly to remove barriers and optimize incentives.

This study highlights some of these issues and opportunities:

- The South Korean government has introduced an aggressive fiscal stimulus package, which includes its Green New Deal (GND). The policies and projects proposed under the GND are largely grouped into: (1) green transition of buildings and infrastructure, (2) expansion of low-carbon and distributed energy, and (3) green industrial innovation. The South Korean policies show that: (1) it is possible to address both economic and climate concerns through fiscal stimulus packages, (2) the GND, along with other recent developments, signifies a positive change and promising opportunity, as a manifestation of political commitment and guarantee of large-scale public investments, and (3) the difficult challenges of transitioning from a heavily centralized energy system to a distributed one and building a promising and attractive environment for private investments, require additional policies to be addressed.
- Indonesia's National Economy Recovery (PEN) puts emphasis on economic stability and liquidity as the main concern in fiscal stimulus. PEN is designed to heavily focus on social protection and fiscal incentive. The allocation of PEN funding is flexible, depending on the activities planned by the assigned entities by the government, and there is fiscal room that can be used to affect energy transition in Indonesia both directly and indirectly. However, allocations related to energy transition programs cover only 0.9% of total PEN, both on demand and supply sides. Therefore, only a few barriers to private investment in clean energy in Indonesia can be addressed by PEN through financing for SMEs and cooperatives and guarantee instruments provided in PEN for a corporation which can cover 80% of NPL.

To address the above, this study provides some recommendations:

1. Stimulus spending offers a window of opportunity for both nations to support short-term economic growth while addressing longer-term climate, sustainability, and economic inclusion goals. South Korea is already on this path, but adjustments proposed in this report could increase the power of the proposed government spending by removing barriers and creating more incentives that would attract private investment. Learning from South Korea's GND, Indonesia needs to take advantage of the economic recovery momentum to boost the long-term energy transition agenda by formalizing green recovery aspects and making green job creation more explicit within the PEN framework.
2. To further ensure public spending is efficiently applied towards longer-term sustainability goals, South Korea and Indonesia's fiscal stimulus need to include specific targets, timelines, sectoral pathways and plans to reduce emissions and stimulate economic recovery. A toolbox of policies and measures, such as reallocating subsidies to support solar PV adoption in Indonesia and revising relevant laws in South Korea to allow companies to enter into power purchase agreements with renewables providers as discussed in this report, are required to better address both short-term incentives and long-term structural changes.
3. Specific attention needs to be given to create enabling environments that attract private investment in the green transition plan, while relieving the pressure on public spending. For South Korea, market policies and practices need to be reformed, while for Indonesia, better fiscal policies are needed, to address long-term investment barriers and attract private investment in both countries.

Ultimately, learning from best practices and focusing on innovation and creativity will allow both countries to leverage their significant fiscal stimulus investments to achieve a more sustainable future.

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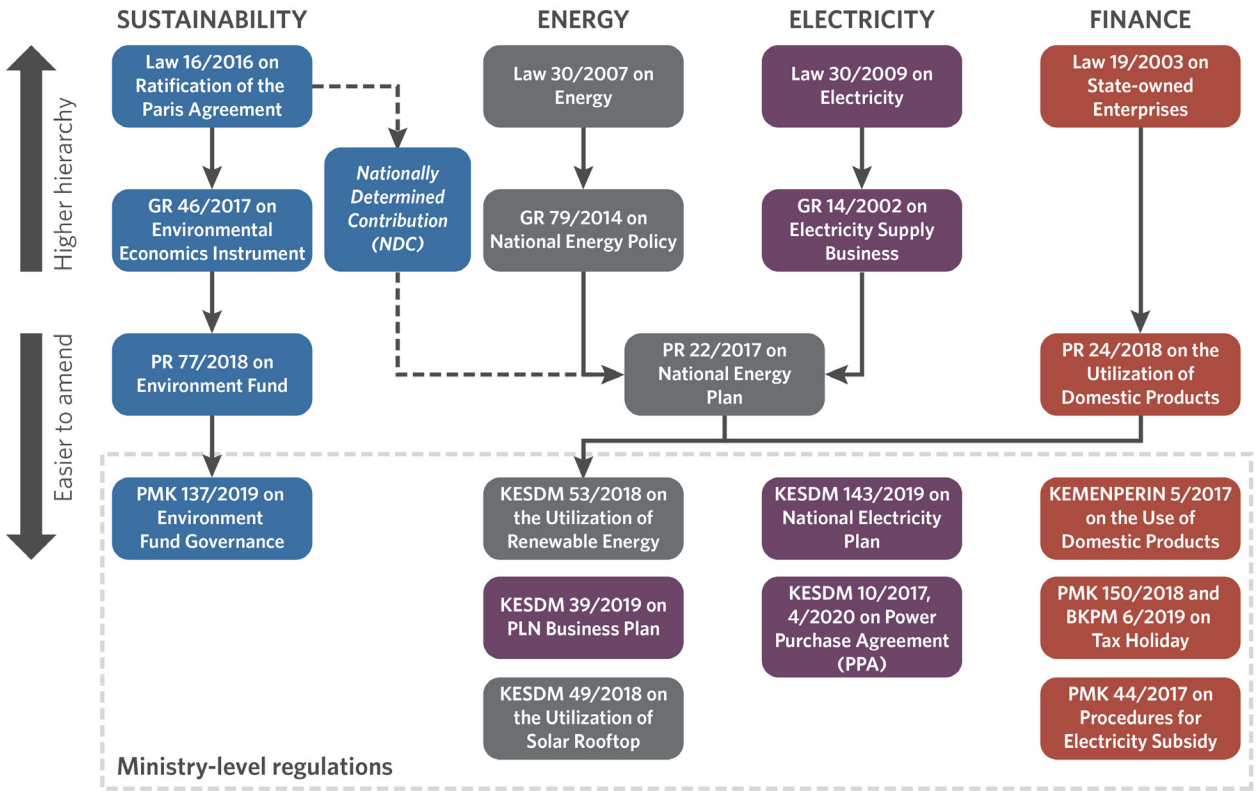
ANNEXURE: INDONESIA'S ENERGY TRANSITION POLICY AND TARGETS

1. ENERGY TRANSITION POLICY AND TARGET: SUPPLY SIDE

In the analysis of existing energy transition policies, this study makes a clear distinction between energy supply and demand, given the nature of policies in both categories. Energy supply policies focus on the ability of the government to provide energy to its users. In energy transition, this includes the envisaged composition of clean energy in Indonesia, and who should finance it, among other things.

The study identifies four categories of energy supply policies based on sustainability, energy, electricity, and finance. The regulations are mapped in the following graph.

Figure 3.1: Indonesia's policies related to energy generation

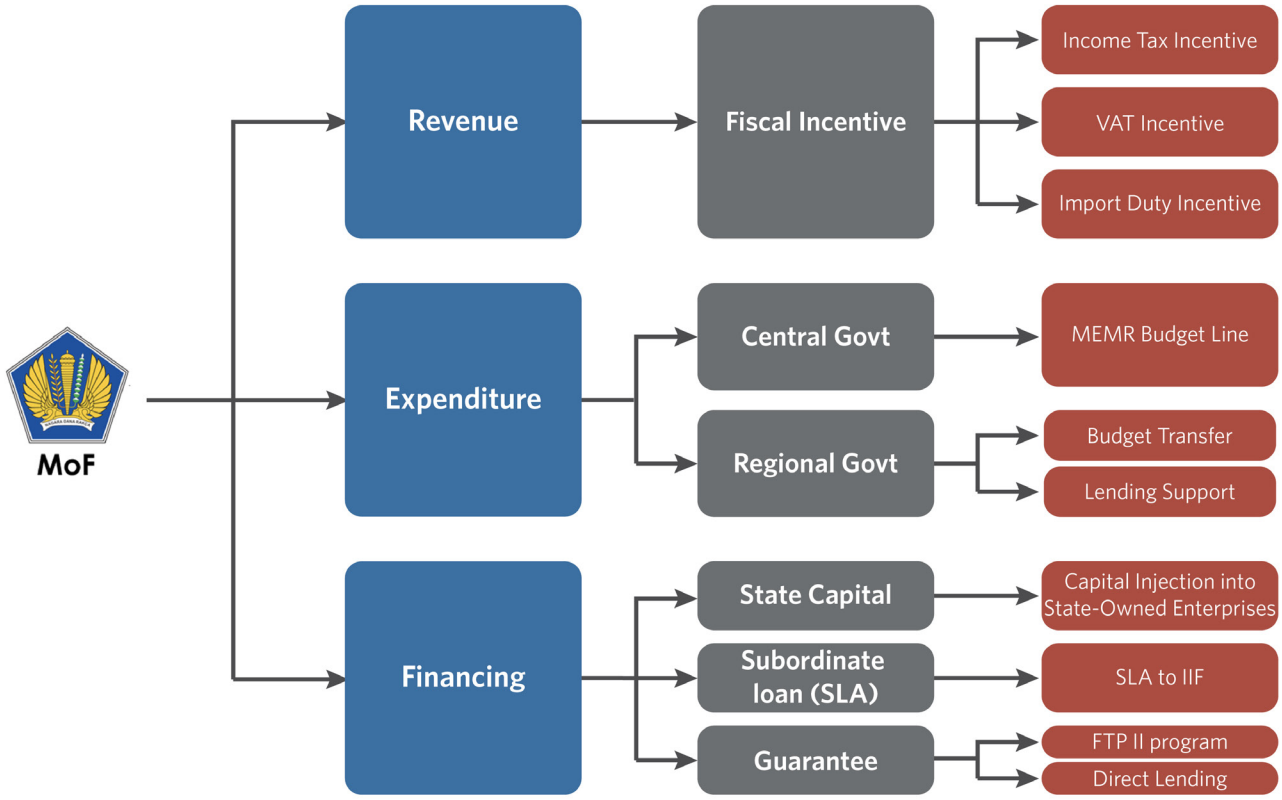


Until early 2020, the Ministry of Finance (MoF) has provided a wide range of fiscal support to attract clean energy investments. Based on fiscal policies, the MoF has provided several incentives for income tax, value-added tax (VAT), and import duty on clean energy projects.

The tax incentives are mainly related to the new clean technology tax waivers, and particularly for imported components. Fiscal support is also available for clean energy projects that include budget lines for ministries, fiscal transfer to local governments, and capital injection into state-owned enterprises to initiate and catalyze clean energy project development.

On the demand side, the MoF also provides credit guarantee mechanisms for national electrification programs that include clean energy projects. The following diagram illustrates the range of fiscal support that the MoF provides for clean energy.

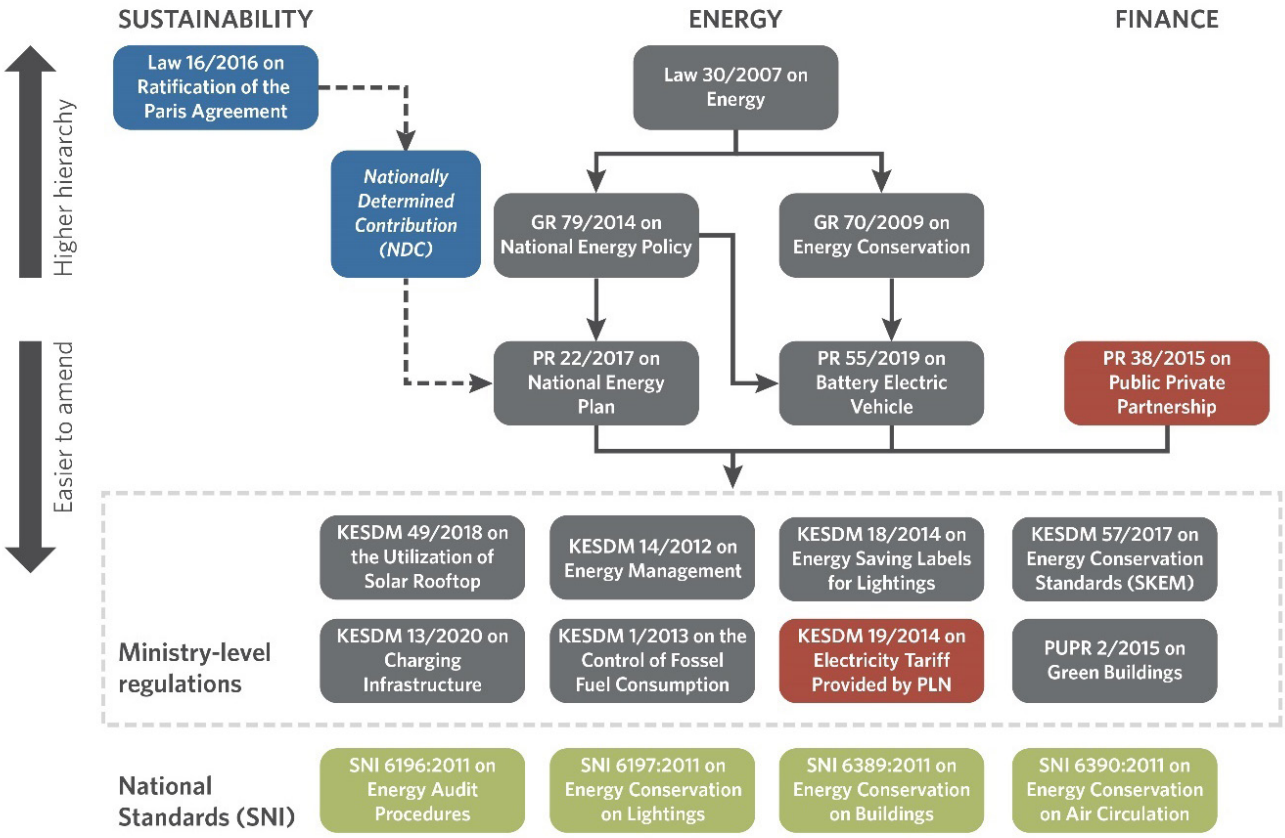
Figure 3.2: Fiscal assistance for clean energy generation from the MoF



2. ENERGY TRANSITION POLICY AND TARGET: DEMAND SIDE

The policies and targets related to the demand side of Indonesia's energy transition refer to those that directly affect end-user behavior in energy consumption. This includes policies related to energy management in general, including energy efficiency and conservation targets, electric vehicles and green buildings.

Figure 3.3: Indonesia's policies related to energy consumption



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