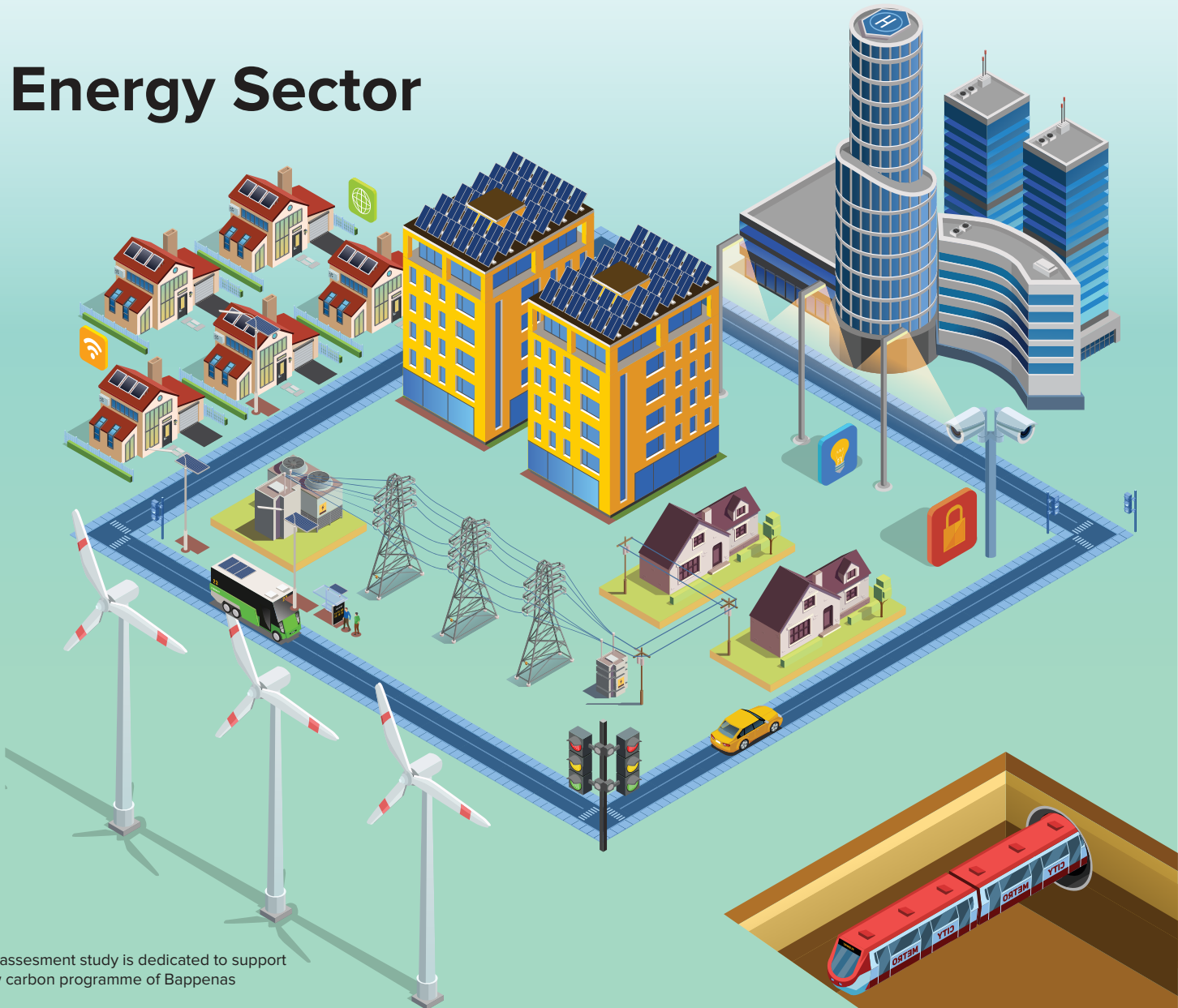


Report

# Green Stimulus Package for National Economic Recovery

## Energy Sector



This rapid assesment study is dedicated to support the B3-low carbon programme of Bappenas



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Organization



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# Report

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# Executive Summary

The Government of Indonesia has accommodated low-carbon development in its 2020 - 2024 National Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional/ RPJMN*) which has been stipulated in Presidential Regulation No. 18 of 2020. As a follow-up to the stipulation of the RPJMN, the Ministry of Energy and Mineral Resources (MEMR) has established a Strategic Plan through the Minister of Energy and Mineral Resources Regulation No. 16 of 2020. The following is a summary of the targets set in the two Regulations regarding the development of low-carbon energy sector:

| Target   | 2024  |
|--|-------|
| Portion of NRE in the National energy mix.         | 19.5% |
| NRE installed capacity (GW)                        | 19.2  |
| Biofuel utilization for domestic use (million kL)  | 17.4  |
| Primary energy intensity (BOE/billion IDR)         | 133.8 |
| Final energy intensity reduction (BOE/billion IDR) | 0.8   |
| GHG emissions reduction                            | 27.3% |
| GHG emissions intensity reduction                  | 24%   |

It is feared that the renewable energy target in the energy mix of 19.5% by 2024 will be difficult to achieve if there are no significant changes in policies and regulations, renewable energy procurement patterns, and the provision of fiscal incentives, so that renewable energy can compete with fossil-based power plants, considering that until 2019 new and renewable energy reaches 9.15% in the energy mix with an installed capacity of 10.16 GW.

The government has provided various fiscal incentives that have been used for the energy sector, such as tax allowances, tax holidays, exemption from import duties, and reduction of gas prices for power plants. The ones that benefit most from this fiscal incentive are projects with large investment values. Meanwhile, the majority of renewable energy projects that will be built are projects with a small investment value, so that they cannot take full advantage of the fiscal incentive facilities, especially for tax holidays. On the other hand, many project financing proposals (including their supporting documents) submitted to the Financial Institutions/Banks do not meet the quality required to provide financing. On the other hand, the uncontrolled risk of investment in renewable energy causes the Financial Institutions/Banks to require the provision of collateral in the form of assets.

Increasing efficiency in energy utilization is a potential that has not been fully maximized, although many activities can actually be carried out without costs or at low cost. Some of the main obstacles to increasing efficiency are mainly related to the relatively cheap energy price, unavailable energy efficiency funding, and the lack of fiscal incentives provided by the government to encourage energy efficiency investment.

In order to encourage the achievement of the targets set in the 2020-2024 RPJMN and the 2020-2024 MEMR Strategic Plan, the following various stimuli are needed:

| Stimuli  | Budget allocation  | Number of supported projects                          | Annual reduction in tCO2 GHG emissions | Employment (people)   | Remarks   |
|--|--|---|--|---|---|
| Tax holiday  | The total investment value is approximately USD 20.5 billion | About 400 projects, depending on capacity per project | 34.450.991 tCO2 per year               | 641,750 people during the construction period and 29,772 people during the operation period |   |
| Tax allowance for 10 years                                     |  |   |  |   |   |
| Import duty exemption  |  |   |  |   |   |
| Non-collected VAT  |  |   |  |   | The value of non-collected VAT is USD 1,333 million   |
| Loan guarantee (USD)   | 111 million  |   |  |   | Assuming the guarantee premium is 1.5% of the loan value, the premium is paid 50% each by the developing government |
| RE development fund (IDR)                                      | 300 billion  | 100   | 1.226.400 - 3.985.800                  | 10.000 - 30.000   |   |
| Rooftop photovoltaic system (PLTS Atap) development fund (IDR) | 3 trillion   | 200.000   | 204.400                                | 1.000.000   | Require 5 people for the construction of each Rooftop system (PLTS Atap)  |
| Dana efisiensi energi (IDR)                                    | 300 billion  | 600   |  |   |   |

Provision of this stimulus will contribute to national economic recovery, flow of investment in renewable energy and energy efficiency, GHG emissions reduction and jobs creation.



# List of Abbreviations

|            |  |
|------------|--|
| BBG/BBM    | : <i>Bahan Bakar Gas/Bahan Bakar Minyak</i> (Fuel Oil/Fuel Gas)                                      |
| NRE        | : New and Renewable Energy   |
| LCDI       | : Low Carbon Development Initiatives   |
| FGD.       | : Focussed Group Discussion  |
| LPG        | : Liquefied Petroleum Gas  |
| RPJMN      | : <i>Rencana Pembangunan Jangka Menengah Nasional</i><br>(The National Medium-Term Development Plan) |
| BAPPENAS   | : <i>Badan Perencanaan Pembangunan Nasional</i> (National Development Planning Agency)               |
| PLN        | : <i>Perusahaan Listrik Negara</i> (State Electricity Company)                                       |
| PLTA       | : <i>Pembangkit Listrik Tenaga Air</i> (Hydroelectric Power Plant)                                   |
| PLTB       | : <i>Pembangkit Listrik Tenaga Bayu</i> (Wind Power Plant)   |
| PLTD       | : <i>Pembangkit Listrik Tenaga Diesel</i> (Diesel Power Plant)                                       |
| PLTG/GU    | : <i>Pembangkit Listrik Tenaga Gas dan Uap</i> (Combined Cycle Power Plant)                          |
| PLT HYBRID | : <i>Pembangkit Listrik Tenaga Hybrid</i> (Hybrid Power Plant)                                       |
| PLTM       | : <i>Pembangkit Listrik Tenaga Minihidro</i> (Minihidro Power Plant)                                 |
| PLTP       | : <i>Pembangkit Listrik Tenaga Panas Bumi</i> (Geothermal Power Plant)                               |
| PLTS       | : <i>Pembangkit Listrik Tenaga Surya</i> (Photovoltaic System)                                       |
| PLTU       | : <i>Pembangkit Listrik Tenaga Uap</i> (Steam-Electric Power Plant)                                  |
| PSBB       | : <i>Pembatasan Sosial Berskala Besar</i> (Large-Scale Social Restrictions)                          |
| PMK        | : <i>Peraturan Menteri Keuangan</i> (Minister of Finance Regulation)                                 |
| RUU        | : <i>Rancangan Undang-Undang</i> (Bill)  |
| RUPTL      | : <i>Rencana Usaha Penyediaan Tenaga Listrik</i> (Electricity Supply Business Plan)                  |

# A

## Introduction

The government has formulated a policy on Low Carbon Development Initiative (LCDI) which integrates environmental considerations (carbon emissions and carrying capacity) into the development planning framework. LCDI has been adopted in the RPJMN 2020-2024 and has begun to be implemented at the national and regional levels. However, due to the COVID-19 pandemic, the government's priorities have shifted to prioritizing handling the pandemic and reallocating the budget to deal with current priorities. This has an impact on the promotion of green economy in Indonesia that places "sustainability" in development programs and policies. It definitely will affect the implementation of LCDI, including the energy sector. Therefore, the current challenge is how to make better economic, social and environmental recoveries.

The government is currently preparing a National Economic Recovery Program which is expected to be adopted in the revised RPJMN 2020 - 2024. It is estimated that short-term policies will still be dominated by COVID-19 handling, which could result in a lack of focus on sustainability aspects. Therefore, medium and long term development scenarios are proposed that will turn back the development to a greener future path. The Directorate of Environment of National Development Planning Agency (Badan Perencanaan Pembangunan Nasional/Bappenas) proposes a "Build Back Better" approach within the LCDI framework for medium and long-term development scenarios, expecting that there will be opportunities to transform the economy in a better direction in all aspects, including economic, social and environmental aspects. In this regard, a green stimulus policy package, including for the energy sector, will be crucial to recalibrate existing efforts. For the energy sector, it is expected to focus on:

1. Renewable energy development;
2. Energy efficiency applications;
3. Provision of green jobs.

### **Purpose of the study**

The purpose of this study is to provide an overview of the potential for low-carbon development in the energy sector and to explore fiscal stimulus/incentive options needed so that the potential for low-carbon development in the energy sector can be realized.

### **Study methodology**

The study begins with a desk review to identify various regulations, data and information related to the study. Furthermore, surveys and interviews were conducted with various relevant stakeholders. In order to obtain more complete data, the Consultants submitted formal and informal requests to obtain data, especially to the Ministry of Finance, the Ministry of Energy and Mineral Resources, and the Indonesia Investment Coordinating Board (Badan Koordinasi Penanaman Modal/BKPM). Furthermore, to obtain input from stakeholders, an FGD was conducted by inviting stakeholders from the energy sector. This report is a summary of the various activities mentioned above.

### **Scope and limitations of the study**

This study was conducted for the energy sector, particularly the potential for renewable energy development and energy efficiency as an effort to promote low-carbon development. The study was conducted qualitatively, considering the availability of data that can be used to evaluate these potentials.



# B National Energy Policy Achievements

Based on the report of the Ministry of Energy and Mineral Resources (MEMR) in 2019, the following are some of the performance achievements of the Ministry of Energy and Mineral Resources related to the targets set in the 2020-2024 RPJMN.

## a. Renewable energy targets

The achievement of renewable energy targets in the new energy mix reached 9.15% of the target of 13.4% in 2020 and is estimated to be in the range of 20% in 2024 based on the RPJMN 2020-2024 target, so it is feared that if no significant efforts are made to encouraging the development of renewable energy, the target of renewable energy in 2024 will not be achieved.

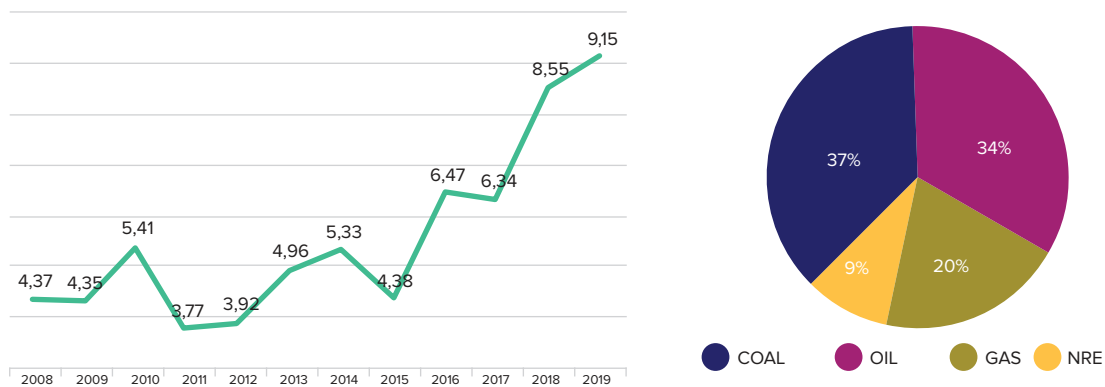


Figure 1 – Renewable energy achievement in the 2019 energy mix  
Source: MEMR, 2019

Specifically, for the power generation sector, the energy mix has reached 13.96% per July 2020 (See Figure 2 below).

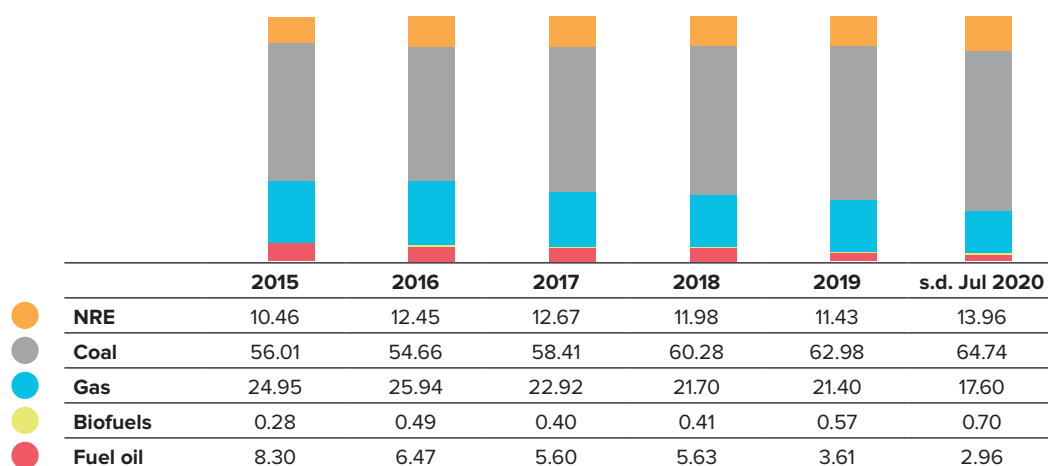


Figure 2 – Energy mix in the power generation sector  
Source: Indonesian Electrical Power Society (IEPS/MKI)

**b. Renewable energy installed capacity**

In total (on-grid and off-grid), until 2019 it only reached 10,157 MW. Hydroelectric Power Plant (PLTA) contributed the most to the provision of renewable energy power plants with a share of around 57.94%, followed by Geothermal Power Plant (PLTP) at 20.98% and bioenergy generation at 18.55%. The rest consists of Photovoltaic system (PLTS), Wind Power Plant (PLTB) and Hybrid Power Plant (PLT hybrid). Not all of the energy generated is evacuated to the electricity grid owned by PLN, some of them are power plants for private use, especially the Bioenergy Power Plant (PLT Bioenergi) used in the Palm Oil Mill (POM).

|              | 2015    | 2016    | 2017    | 2018    | 2019    | 2020    |
|--------------|---------|---------|---------|---------|---------|---------|
| ● Hybrid     | 4,0     | 4,0     | 4,0     | 4,0     | 4,0     | 4,0     |
| ● Wind       | 1,5     | 1,5     | 1,5     | 143,5   | 154,3   | 154,3   |
| ● Solar      | 33,4    | 43,1    | 50,9    | 60,2    | 97,4    | 231,9   |
| ● Bioenergy  | 1.741,7 | 1.783,1 | 1.856,8 | 1.882,8 | 1.884,6 | 2.131,5 |
| ● Geothermal | 1.438,3 | 1.583,3 | 1.808,3 | 1.948,3 | 2.130,6 | 2.270,7 |
| ● Water      | 5.227,5 | 5.620,9 | 5.657,9 | 5.742,1 | 5.885,5 | 6.050,7 |

Table 1 – Development of renewable energy generation  
Source: MEMR

The installed capacity of on-grid renewable energy power plants served by PLN until August 2020 has only reached 7,992 MW of the 2020 RPJMN target of 14.5 GW (on-grid).

| A. NRE Power Plant                                      | MW     | %MW    |
|---|--------|--------|
| Geothermal Power Plant (PLTP)                           | 2,443  | 3.90%  |
| Hydroelectric Power Plant (PLTA)                        | 4,707  | 7.50%  |
| Minihidro Power Plant (PLTM)                            | 454    | 0.70%  |
| Photovoltaic System (PLTS)                              | 79     | 0.10%  |
| Wind Power Plant (PLTB)                                 | 131    | 0.20%  |
| Biomass Power Plant/Waste-To-Energy Plants (PTL Bio/Sa) | 179    | 0.30%  |
| Subtotal  | 7,992  | 12.60% |
| B. Non NRE Power Plant                                  | MW     | %MW    |
| Steam-Electric Power Plant (PLTU)                       | 31,827 | 50.40% |
| Combined Cycle Power Plant (PLTGU)                      | 12,137 | 19.20% |
| Gas Engine Power Plant (PLTG/MG)                        | 6,765  | 10.70% |
| Diesel Power Plant (PLTD)                               | 4,487  | 7.10%  |
| Subtotal  | 55,216 | 87.40% |
| TOTAL   | 63,208 |        |

Table 2 - PLN generation capacity until August 2020  
Source: Indonesian Electrical Power Society (IEPS/MKI)

From the table and graph above, it can be seen that the achievement of renewable energy targets in the energy mix, particularly for the generation sector, is still far from the 23% target that must be achieved by 2025. It is feared that if the renewable energy development pattern still uses the “business as usual” scenario, then the renewable energy target will not be achieved by 2025.

The slow pace of developing renewable energy-based power plants is caused by several reasons, including:

- a. Existing regulations are not effective in driving the development of renewable energy. Changing regulations often create uncertainty in investing. Therefore, it is necessary to rearrange regulations related to renewable energy, starting from the level of Laws, Government Regulations, Presidential Regulations and relevant Ministerial Regulations to make strong and long-term regulations that can attract local and international investors to invest in renewable energy.;

- b. Lack of government commitment in prioritizing renewable energy development, from planning to implementation and operations carried out by PLN and Pertamina. The government is still prioritizing the use of fossil-based energy, such as Coal-Fired Power Plant (PLTU Batubara), PLTG/GU, and PLTD (especially in remote areas), without considering the cost of externalities. The impact of COVID-19 also causes a reduced demand for energy today, so that the share of renewable energy is also reduced in the energy mix. In fact, it should be noted that if a Power Purchase Agreement (PPA) of a renewable energy project is signed at this time, then the project will only operate 2-7 years later, depending on the type of technology. This means that the purchase of electricity that will be generated from the PPA at this time will only be paid for 2-7 years later and it is expected that when the power plant is operated, the economy will be recovering so that the absorption of electricity from renewable energy will also increase. Thus, PLN's burden for the payment of electricity purchased will only be realized between 2-7 years from now, when the power plant is officially operational. It also applies to the provision of incentives in the form of reduced taxes (tax allowance and tax holiday), which can only be used after the power plant operates. Exceptions are related to the provision of fiscal incentives in the form of exemption from import duties for imports of capital goods in the construction of renewable energy-based power plants;
- c. The current price policy for renewable energy has not prioritized economic aspects and is not in accordance with the provisions in Law no. 30/2007 concerning Energy, in particular Article 7 and its Elucidations. On the other hand, the selling price of electricity from PLN to the public also does not reflect the economics of the energy sold, so there is a gap between the expected return from the developer and the selling price of electricity to the public, because PLN cannot set the selling price of electricity to the public according to economic value;
- d. To date, no special incentives have been provided by the government for the development of renewable energy even though renewable energy provides environmental, health and social benefits. The existing incentive regulations can be beneficial for all types of power plants, including fossil-based plants. The ones that benefit most from the current regulation are projects with large investment values, while the majority of renewable energy projects have relatively low investment values, so that the majority of renewable energy projects gain less benefit that can reduce investment costs. Thus, special incentives are needed so that renewable energy can compete with fossil-based energy;
- e. Funding for renewable energy development from national banks/financial institutions is limited because the PPA between PLN and renewable energy developers is not/less bankable for project finance. On the other hand, national banks/financial institutions are not familiar with the risks of developing renewable energy;
- f. Until now, the procurement pattern for renewable energy still prioritizes small scale, so that the funding costs for developing renewable energy are high. This is not the case with the procurement for fossil-based power plants, except for PLTD, in which the majority of plants being tendered are large-scale. This has an impact on the absence of benefits for Indonesia from the lowering of technology prices, especially for PLTS and PLTB;
- g. The technology for locally produced renewable energy is very limited. Meanwhile, if there is local technology, the price is higher than the import purchase price. For example, the price of locally produced solar modules is more than 30% higher than imported products because some of the raw materials are still imported and the production capacity is also low;

Considering the above issues, in order to achieve the RPJMN 2020-2024 target on renewable energy, the following matters are necessary:

- a. Finalization of regulations related to renewable energy which are currently in process, especially the NRE Bill and the Presidential Regulation on Renewable Energy Prices;
- b. Determination of Electricity Supply Business Plan (*Rencana Usaha Penyediaan Tenaga Listrik/ RUPTL*) that prioritizes the development of renewable energy;
- c. Determination of the operating pattern of power plants that prioritize renewable energy;
- d. Provision of funds for the development of renewable energy at low interest rates, consisting of:
  - provision of development funds provided for developers to improve the quality of documents

- so that financial institutions/banks are willing to provide funding for renewable energy development,
- providing investment costs at low interest rates (e.g. through interest subsidies);
- provision of guarantee instruments to reduce banking risk.
- e. Provision of special fiscal incentives for developers and compensation for procurement of renewable energy;
- f. Development of renewable energy technology and industry;

**c. Energy efficiency**

Based on the Ministry of Energy and Mineral Resources Performance Report for 2019, it is stated that primary energy intensity reaches 424.9 BOE/Billion IDR. This realization has met the Ministry of EMR's performance target of 425 BOE/Billion IDR for 2019 and it is expected to be able to achieve the performance target for 2020 of 421 BOE/Billion IDR.

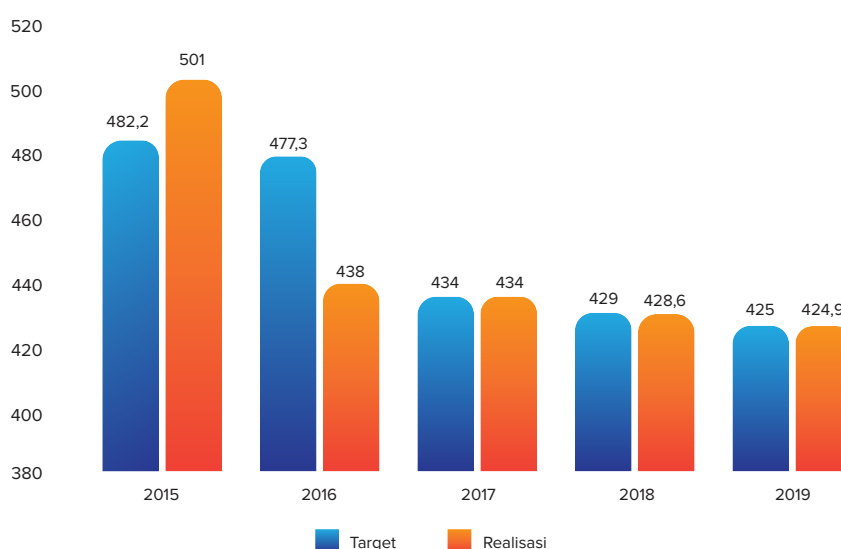


Figure 3 – The 2019 energy intensity achievements  
Source: MEMR

The achievement of this target is closely related to the role of the Ministry of Energy and Mineral Resources in carrying out various coaching and socialization activities related to the importance of efficient energy use which is supported by the use of online reporting platforms such as Online Energy Management Reporting (*Pelaporan Online Manajemen Energi/POME*), Online Energy and Water Saving Reporting (*Pelaporan Online Penghematan Energi dan Air/POPEA*), Air Conditioner (AC) Minimum Energy Performance Standards (MEPS) and Self-ballast Lamp MEPS. However, energy savings can still be maximized in various sectors, as shown in the following table:

| Energy users                               | Identified* | Energy consumption** (TOE/year) |
|--|-------------|---------------------------------|
| Utility generators                         | 30          | 35,373,168                      |
| Oil and gas producers                      | 25          | 1,892,969                       |
| Mining operations                          | 16          | 4,300,020                       |
| Oil and gas processing                     | 4           | 2,655,593                       |
| Transmission and distribution              | 7           | 311,160                         |
| <b>Total</b>                               | <b>82</b>   | <b>44,532,910</b>               |
| * Energy users > 6,000 TOE/year            |             |                                 |
| ** Sources from POME MEMR and Proper KLHK  |             |                                 |
| Potential energy savings: 400,000 TOE/year |             |                                 |

Table 3 – Potential for energy savings in the industrial sector  
Source: MASKEEI

The potential for energy savings is also found in industrial activities and commercial buildings, as shown in the following table:

| Sector   | Minimum energy threshold (TOE/year)*                     | Number of company | Energy consumption (TOE) | Potential savings (TOE/year) |
|----------|--|-------------------|--------------------------|------------------------------|
| Industry | 6,000 (in accordance with Government Regulation 80/2009) | 35,373,168        | 11,985.041               | 1,198.504                    |
|          | 4,000 (proposed adjustments)                             | 1,892,969         | 12,643.463               | 1,264.346                    |
| Building | 6,000 (proposed adjustments)                             | 4,300,020         | 776,285                  | 77,628                       |

Table 4 – Potential for energy savings with regulatory changes  
Source: MASKEEI

Many energy efficiency activities that have been carried out are “no cost” and “low cost” activities, because those activities can actually be done immediately by energy users. Meanwhile, implementation of energy efficiency with a greater impact requires significant investment, thus requiring economic considerations and the availability of financing (See Annex 1: Examples of energy utilization and production activities in various industries). Between 2011 - 2012, the Director General of New, Renewable Energy and Energy Conservation conducted energy audits involving 555 companies/institutions. Below are the total implementation costs of the 162 companies/institutions participated in the energy audit:

| Classification of implementation costs | Agro chemistry | Building | Glass | Metal | Manufacture | Paper | Textile | Cement | Pipe | Total implementation cost |
|--|----------------|----------|-------|-------|-------------|-------|---------|--------|------|---------------------------|
| up to 1 billion                        | 31             | 53       | 2     | 9     | 17          | 4     | 24      |        | 1    | 39,612,466,020            |
| > 1 Billion – 10 Billion               | 4              | 2        |       | 5     |             |       | 5       | 2      |      | 26,786,699,000            |
| > 10 Billion – 30 Billion              |                |          |       |       |             |       |         |        |      | 14,330,000,000            |
| > 20 Billion – 50 Billion              |                |          |       |       |             |       |         |        |      | 46,270,000,000            |
| Total                                  | 35             | 55       | 2     | 17    | 17          | 4     | 29      | 2      | 1    | 127,199,165,020           |

Table 5 – Estimated investment costs for energy efficiency activities  
Source: Ministry of Energy and Mineral Resources Energy Audit Results, 2010-2012 (processed)

From the table above, it can be seen that around 87% of energy efficiency activities can be carried out at a cost of < IDR 1 billion, 18% of activities will cost between IDR 1 billion - IDR 10 billion, and the rest will cost > IDR 10 billion. In other words, if the government intends to encourage energy efficiency improvements involving a larger number of business actors, the government can focus support on business groups that only need investment costs <IDR. 1 billion.

Problems in the implementation of activities that have a major impact on reducing energy consumption, among others:

- Government Regulation No. 70/2009 regulates the provision of fiscal and non-fiscal incentives or companies that are successful in managing energy, but until now only non-fiscal incentives have been provided by the government in the form of awards. Meanwhile, the fiscal incentives have never been realized. In other words, the efforts made by the government to encourage the implementation of energy efficiency activities are limited to coaching, socialization, provision of reporting platforms and awarding;
- Energy efficiency activities requires funding at low interest rates. As shown in Table 6, many energy efficiency activities require funding of < IDR 1 billion, but until now there are no banks willing to provide funding for energy efficiency investments;
- The threshold for energy users who are required to carry out energy management, as stipulated in Government Regulation No. 70/2009, which is > 6,000 TOE/year, is too loose. From Table 5 above, it can be seen that based on the Government Regulation No. 70/2009, the number of companies obliged to carry out energy management is only 327 companies, whereas if the threshold is lowered to 4,000 TOE/year, the number of companies required to carry out energy management

will be 462 companies, and this increases the potential for energy savings by about 5.5%. This threshold reduction has been included in the proposed revision of Government Regulation No. 70/2009.

Therefore, to encourage greater energy savings and achieve the RPJMN targets and the National Energy Policy (*Kebijakan Energi Nasional/KEN*) targets, it is necessary to do the following:

- a. Finalize the revision of Government Regulation No. 70/2009;
- b. Provision of tax incentives for energy efficiency activities;
- c. Provision of cheap funds for energy efficiency investment.

## C Pengalaman Indonesia dalam pembangunan rendah karbon

Indonesia has carried out many activities related to low carbon development, both those using government funds and those financed by business actors and development partners, including:

1. Transportation sector:
  - a. Development of public transportation (busway, MRT, LRT) in some cities, especially Jakarta. The government invests around IDR 16 trillion for MRT Phase I construction, around IDR 25.7 trillion for Jabodetabek LRT, and around IDR 12.5 trillion for Palembang LRT;
  - b. Development of sidewalks in various cities;
  - c. Provision of biodiesel fuel which currently has reached B30 and is in testing for B40;
  - d. Converting Fuel Oil (Bahan Bakar Minyak/BBM) to Fuel Gas (Bahan Bakar Gas/BBG) for public transportation in various cities;
2. Generation sector
  - a. Construction of various low emission power plants (for example: super critical coal power plant, PLTGU) and renewable energy sold to PLN;
  - b. Development of various renewable energy power plants, including in areas where electricity sourced from PLN is not yet available;
  - c. Distribution of Energy-Saving Solar Lamps (Lampu Tenaga Surya Hemat Energi/LTSHE));
3. Household sector
  - a. Conversion of kerosene to LPG;
  - b. Conversion of kerosene to biomass stoves;

These activities have directly contributed to reducing Indonesia's greenhouse gas emissions.

With the enactment of the Kyoto Protocol in 1992 and starting operations in 2004, Indonesia has registered 147 projects as CDM (Clean Development Mechanism) projects. The registered projects have the potential to reduce Indonesia's greenhouse gas emissions. Until 2012, the potential for emission reduction resulting from these activities reached 110,137,000 tCO<sub>2</sub>e and could reach 135,899,425 tCO<sub>2</sub>e by 2020. Of this potential, 34,944,465 Certified Emission Reduction (CER) units (or equivalent to reduction in GHG emissions by 34,944,465 tCO<sub>2</sub>e) have been issued. With the exception of N<sub>2</sub>O emissions, PFCs, SF<sub>6</sub> and some cement projects, these projects are related to the energy sector (see table below). From the table, it can be seen that projects registered as CDM projects have been able to mobilize the private sector investment of USD 6,993 million, and some of these projects have taken advantage of incentives provided by the government, in particular exemption from import duties for imports of machinery and other equipment.

| Type of project                  | Total kCERs until 2012 | Government incentive   |
|----------------------------------|------------------------|--|
| Biomass energy                   | 7,500                  |  |
| Cement                           | 1,368                  |  |
| Industrial energy efficiency     | 3,179                  |  |
| Energy efficiency for own use    | 345                    |  |
| Energy efficiency for supply     | 2,969                  |  |
| Fossil fuel replacement          | 2,630                  |  |
| Fugitive emissions               | 2,725                  |  |
| Geothermal Power Plant (PLTP)    | 44,745                 | VAT and income tax are paid by the government for imports of machinery and spare parts |
| Hydroelectric Power Plant (PLTA) | 16,838                 | VAT and income tax are paid by the government for imports of machinery and spare parts |
| Landfill gas                     | 6,781                  | VAT and income tax are paid by the government for imports of machinery and spare parts |
| N2O methane gas avoidance        | 18,983                 | VAT and income tax are paid by the government for imports of machinery and spare parts |
| N2O                              | 1,495                  |  |
| PFCs and SF6                     | 579                    |  |
| Total                            | 110,137                |  |
| Total investment                 | 6.933 million USD      |  |

Table 6 – CDM projects in Indonesia  
Source: UNEP DTU Partnership



# D Impact of COVID 19 on the energy sector

The energy sector is also affected by the COVID-19 pandemic. This can be seen from the sales of PLN electricity between January - July 2020. To prevent the transmission of COVID 19, during the implementation of the Large Scale Social Restriction (Pembatasan Sosial Berskala Besar/PSBB) in several areas in April 2020, there was a decrease in electricity demand in the industrial, business and traction (Commuterline) sectors. The decline in consumption continued in May 2020, coinciding with the month of Ramadan, Eid Al-Fitr and extended PSBB, so that electricity demand in the industrial sector fell by 21.51% from the previous month.

The existence of the PSBB easing policy (transitional PSBB) in June 2020 increased electricity demand in the industrial sector by 22.58% from the previous month and in July it recorded an increase of 4.77% from June.

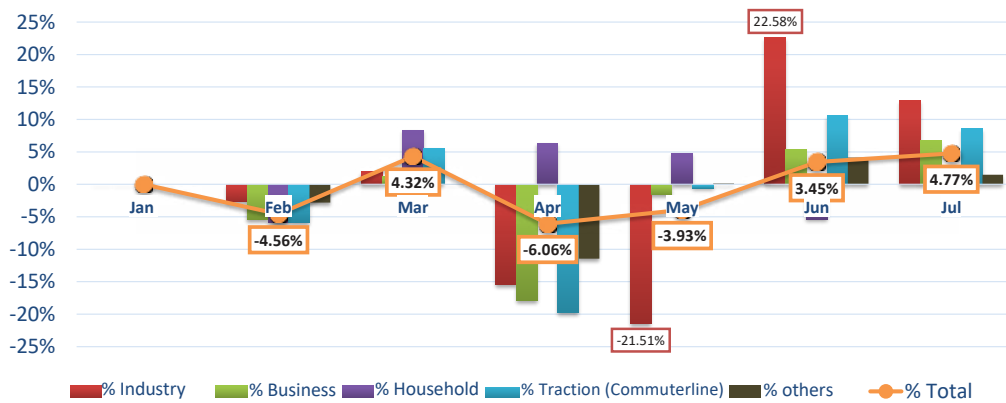


Figure 4 - Electricity sales in January 2020 to July 2020  
Source: MEMR

The decrease in fuel oil consumption also occurred during the pandemic, where the largest decrease occurred during the implementation of the PSBB. The sales of fuel oil slowly rose during the implementation of the transitional PSBB, even though it had not reached the sales as it was in early 2020. The reduction in electricity and fuel oil consumption during COVID 19 automatically reduced GHG emissions. On the other hand, this reduction in electricity consumption was followed by changes in the plans of the government and PLN in developing renewable energy.

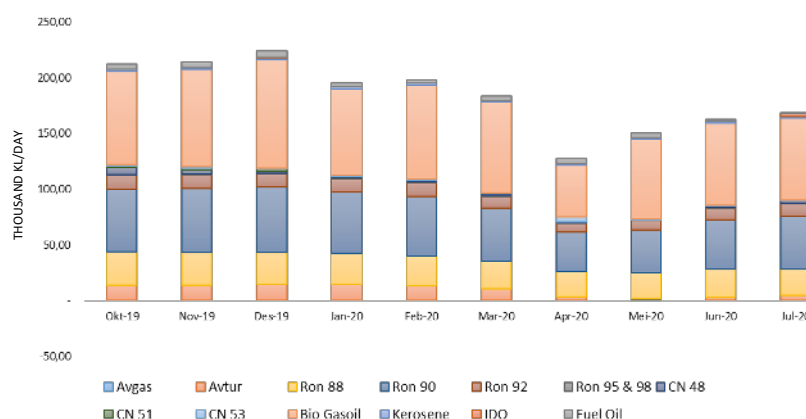


Figure 5 – Fuel sales during the COVID 19 period  
Source: MEMR

## E

## Stimulus/incentive for the energy sector

The government has established regulations that form the basis for providing various stimuli/incentives to the business world. The incentives/stimuli include:

### 1. Income tax deduction for investment in certain business fields in certain areas

Income tax deductions are given for investment in certain business fields and/or in certain areas as well as business expansion based on Government Regulation no. 78/2019 which replaced the old provisions, namely Government Regulation Number 9 of 2016 and the Indonesian Investment Coordinating Board (*Badan Koordinasi Penanaman Modal/BKPM*) Regulation Number 13 of 2017. This facility is provided with the following conditions:

- high investment value or for export;
- large labor absorption;
- high local content

The income tax facility provided is in the form of:

1. 30% (thirty percent) net income deduction of the total investment value in the form of tangible fixed assets including land, which is used for Main Business Activities, is charged for 6 (six) years at 5% (five percent) each year;
2. accelerated depreciation of tangible fixed assets and accelerated amortization of intangible assets acquired in the context of investment
3. the imposition of Income Tax on dividends paid to foreign Taxpayers other than a permanent establishment in Indonesia of 10% (ten percent), or a lower rate according to the applicable double tax avoidance agreement;
4. compensation for losses that are longer than 5 (five) years but not more than 10 (ten) years.

Several business fields that can apply for the fiscal incentive facility include coal gasification, geothermal exploitation, coal briquette industry, electrical equipment industry, electricity generation with an investment value of < IDR 100 billion, waste management that produces methane gas, biofertilizer or carbon dioxide gas. This Government Regulation was followed up with the issuance of Minister of Finance Regulation No. 11/2020 which regulates in more detail the provision of this fiscal facility.

Between 2018 - 2020 (until September), approval for the tax allowance is only issued for 5 projects with an investment value in the master list of IDR 1,173,856,798,389.

| 2018                             |                     |                          | 2019                         |                     |                          | 2020 (until September)     |                     |                          |
|----------------------------------|---------------------|--------------------------|------------------------------|---------------------|--------------------------|----------------------------|---------------------|--------------------------|
| Business field                   | Number of approvals | The approved asset value | Business field               | Number of approvals | The approved asset value | Business field             | Number of approvals | The approved asset value |
| Hydroelectric power plant (PLTA) | 1                   | 104,482,812,589          | Minihidro Power Plant (PLTM) | 2                   | 702,198,000,000          | Photovoltaic System (PLTS) | 2                   | 367,175,985,800          |

Table 7 – Tax allowance approvals in 2018 - 2020  
Source: BKPM

### 2. Tax Holiday

Tax holidays are granted to businesses based on the Minister of Finance Regulation No. 35 of 2018 regarding Tax Holiday. Based on this regulation, the government provides incentives in the form of a tax holiday of up to 100%. The length of time for the provision of tax holidays is adjusted to the investment value, which is regulated as follows:

- a. Tax holidays are granted to pioneer industries, which currently consists of 17 industries with 153 types of business, including for power plants that fall into the category of economic infrastructure;
- b. The investment value between IDR 500 billion-IDR 1 trillion will receive 100% tax holiday for 5 years;
- c. Investment value > IDR 1 trillion - IDR 5 trillion may receive 100% tax holiday for 7 years
- d. Investment value > IDR 5 trillion - IDR 15 trillion may receive 100% tax holiday for 10 years;
- e. Investment value > IDR 15 trillion - 30 trillion may receive 100% tax holiday for 15 years
- f. Investment value > IDR 30 trillion may receive 100% tax holiday for 20 years
- g. Extensions can be made by deducting 50% of income tax for 2 years since the completion of the tax holiday;

| 2018  |                     |                          | 2019  |                     |                          | 2020 (until September)  |                     |                          |
|---|---------------------|--------------------------|---|---------------------|--------------------------|---|---------------------|--------------------------|
| Business field  | Number of approvals | The approved asset value | Business field  | Number of approvals | The approved asset value | Business field  | Number of approvals | The approved asset value |
| Steam-Electric Power Plant (PLTU)   | 1                   | 25,422,474,694,000       | Minihidro Power Plant (PLTM)  | 1                   | 1,051,675,006,880        | Photovoltaic System (PLTS)  | 1                   | 311,556,184,380          |
| Steam-Electric Power Plant (PLTU)   | 1                   | 56,600,000,000,000       | Steam-Electric Power Plant (PLTU)   | 7                   | 88,366,963,943,422       | Steam-Electric Power Plant (PLTU)   | 2                   | 4,867,209,317,843        |
| Hydroelectric Power Plant (PLTA)  | 2                   | 22,072,433,163,900       | Hydroelectric Power Plant (PLTA)  | 9                   | 45,553,243,153,347       | Hydroelectric Power Plant (PLTA)  | 1                   | 338,812,913,570          |
|   |                     |                          | Geothermal Power Plant (PLTP)   | 2                   | 8,762,683,912,608        | New and Renewable Energy Power Plants (PLTEBT)                                | 1                   | 1,875,000,000,000        |
| Basic organic chemicals industry sourced from petroleum, natural gas and coal | 1                   | 49,000,000,000,000       | Basic organic chemicals industry sourced from petroleum, natural gas and coal | 6                   | 464,626,326,505,551      | Basic organic chemicals industry sourced from petroleum, natural gas and coal | 1                   | 1,166,770,000,000        |

Table 8 – Tax Holiday Approvals in 2018 – 2020  
Source: BKPM

From the table above, it can be seen that the government has granted tax holidays for both fossil-based and renewable energy-based investments, including for power generation. Respectively, of the approved asset values, approvals granted for renewable energy generation were only 14.4%, 9.1% and 29.5% for 2018, 2019 and 2020 (to September).

It should be noted that this facility does not differentiate environmental or social benefits from the investments, but only focuses on investment value. Thus, the ones that benefit most from the tax holiday policy is constructions with large investment costs. In the power generation sector, the ones that benefit most from this facility is the construction of a large capacity PLTU at a cost of > IDR 1 trillion. Based on existing regulations, this PLTU will obtain tax holiday facilities for 7 years. Added with the policy of not charging VAT for coal purchase for PLTU, these two policies will greatly reduce the price of electricity generated from PLTU.

On the other hand, the majority of renewable energy power plants will not be able to enjoy sufficient tax holiday facilities to encourage a reduction in the price of electricity generated, considering that the majority of small and medium scale renewable energy power plants with an investment cost of less than IDR 500 billion. Only PLTP and large-scale renewable energy power plants will enjoy the tax holiday facility.

Therefore, in order to support the development of renewable energy, a tax holiday facility that can encourage the price of renewable energy to compete with fossil-based power plants is need. This

special facility should be provided in exchange for the environmental and social benefits generated by the development of renewable energy-based power plants.

### 3. Exemption of import duties

The form of incentives for exemption from import duty or import duty facilities is the exemption of 2 years of import duty or directly submitting 4 years of applications for companies using locally produced machines (min 30% of local content). Policies regarding import duty facilities are regulated in: (i) Ministry of Finance Regulation Number 176 of 2009 in conjunction with Number 188 of 2015, (ii) Ministry of Finance Regulation Number 66 of 2015, (iii) Ministry of Finance Regulation Number 259 of 2016 and (iv) Regulation of BKPM Number 13 of 2017. This incentive is provided for industries that produce goods and/services, including:

- Tourism and Culture
- Public transportation
- Public Health Services
- Mining
- Construction
- Telecommunication
- Port

The requirements are:

- Has not been produced by local companies
- If a local machine is available, but does not meet the machine technical requirements
- If a local machine is available, but does not meet the required number of machines

In addition, the government also provides Exemption from Import Duty and Tax in the Context of Imports of Goods for Upstream Oil and Gas Business Activities. This fiscal incentive is provided for upstream oil and gas business activities based on the Minister of Finance Regulation No. 217/PMK.04/2019. The import duties include:

- Anti-dumping duty
- Reimbursement duty
- Safeguarding import duty; and/or
- Retaliatory duty

In addition, taxes not collected for import are in the form of VAT, Luxury-Goods Sales, and Income Tax Article 22.

The government also provides facilities for exemption or relief from import duty and/or exemption from VAT on imported goods for Coal Mining Exploitation Work Contract or Work Agreement. This incentive is given based on the Minister of Finance Regulation No. 259/2016. The following things are regulated in the regulation:

- Exemption or relief from import duty on imported goods in the framework of Work Contract (Kontrak Karya/KK) and Coal Mining Exploitation Work Agreement (Perjanjian Karya Pengusahaan Pertambangan Batubara/PKP2B) can only be granted to Contractors whose contracts include exemption or relief from import duties on imported goods in the framework of KK and PKP2B;
- Exemption from Value Added Tax on imported goods in the framework of KK and PKP2B can only be granted to Contractors whose contracts include Value Added Tax exemptions on imported goods in the framework of KK and PKP2B;
- Article 3 (1) The granting of import duty exemption or relief and/or Value Added Tax exemption as referred to in Article 2, shall be given through a masterlist stipulated by the Head of the Indonesian Investment Coordinating Board or an official appointed on behalf of the Minister.

Between 2018 - 2020 (until September) the Government has approved the exemption of import duty for various industries with a total of 1,223 approvals and a total value in the masterlist of IDR 351,564,194,386,723.

| 2018                |                               | 2019                |                               | 2020 (UNTIL SEPTEMBER) |                               |
|---------------------|-------------------------------|---------------------|-------------------------------|------------------------|-------------------------------|
| Number of approvals | The approved masterlist value | Number of approvals | The approved masterlist value | Number of approvals    | The approved masterlist value |
| 514                 | 145,078,435,310,689           | 456                 | 134,791,911,589,130           | 253                    | 71,693,847,486,905            |

Table 9 – Approval of import duty exemption in 2018 - 2020  
Source: BKPM

#### 4. Adjustment to the gas price of USD 6/mmbtu

This gas price setting is based on the Minister of Energy and Mineral Resources Regulation No. 10/2020 concerning Amendments to the Regulation of the Minister of Energy and Mineral Resources Number 45 of 2017 concerning Utilization of Natural Gas for Power Plants. This regulation regulates the price of gas supplied through pipes for power plants (plant gate) to a maximum of USD 6 per mmbtu. If the price exceeds USD 6/mmbtu, it will be recalculated by calculating the purchase price from the contractor plus distribution costs. The price is adjusted by reducing the share of the country. The issuance of this MEMR Regulation was followed by the Minister of Energy and Mineral Resources Decree No. 91K/12/MEM/2020 concerning Natural Gas Prices at Power Plants (plant gate), which stipulates adjustments to gas prices at various power plants operating in Indonesia. Based on the Ministerial Decree, the power plants get gas at a cheaper price, where the decline in gas prices is caused by a decrease in rights that belong to the government. From the calculations made, with the gas price setting, between 2020 - 2024 the government provides a stimulus for gas prices as follows:

| Stimulus | 2020           | 2021           | 2022           | 2023           | 2024           | Total            |
|----------|----------------|----------------|----------------|----------------|----------------|------------------|
|          | 472,566,774.92 | 437,316,775.79 | 361,721,571.63 | 362,966,970.43 | 351,525,647.60 | 1,986,097,740.39 |

Table 10 – Gas price adjustments  
Source: Self-calculations based on the Ministerial Decree No. 89/2020

*Note: The calculation of the stimulus with a price formula using the Realized Export Price (REP) was carried out using the Indonesian Crude Price (ICP) in September 2020, considering that the REP price is not available to the public. Based on this assumption, in the years between 2022 - 2024, the price adjustment is negative, meaning that the new price is more expensive than the price before the enactment of the Ministerial Decree.*

#### 5. VAT borne by the Government

The fiscal incentive in the form of Value Added Tax (PPN) borne by the Government is granted to the upstream oil and gas industry for import goods for upstream oil and gas and geothermal exploration business activities. This incentive is provided based on Minister of Finance Regulation No. 24/2010. The regulation regulates that import VAT for upstream oil and gas (exploration) activities, including geothermal exploration, is borne by the government.

From surveys, interviews and FGDs conducted involving stakeholders in the energy sector, various inputs were identified as follows:

##### 1. Renewable energy:

- Some respondents stated that with the implementation of Online Single Submission (OSS), the management of fiscal facilities in the form of VAT exemption and income tax on imports of machines needed for energy development can be conducted easily. Likewise, the application for fiscal incentive facilities in the form of tax holidays and tax allowances, although still taking some time for the government approval process. However, there are also developers who think that it is still difficult to obtain fiscal incentive facilities;
- Provision of fiscal incentives for renewable energy with investment costs < IDR 500 billion is less beneficial because the time period and the number of fiscal incentives obtained are limited. On the other hand, it is estimated that during the first 5 years after the operation, there will still be “negative cash flow” so that there is no need to pay Corporate Income Tax;

- Many renewable energy developers are less interested in obtaining fiscal incentives in the form of tax allowances because the amount to be received is not too large and is not proportional to the efforts made;
- Many renewable energy developers still do not get sufficient information regarding the fiscal incentive facilities provided by the government.

## 2. Energy efficiency

- Low energy prices make energy efficiency efforts less attractive;
- There is no disincentive if energy management in accordance with Government Regulation No. 70/2009 is not implemented;
- Until now, there has been no fiscal incentive specifically provided for energy efficiency activities;
- Business actors do not prioritize energy efficiency because there are no cash benefits received;
- Banks/financial institutions still find it difficult to understand and provide funding for energy efficiency investments, therefore the Government needs to step in to provide energy efficiency investment funding, especially for SMEs, considering the costs required are not too large, but for now SMEs are having difficulty investing;
- Existing regulations are deemed inadequate for investing in energy efficiency, especially if the investment is carried out by other parties/is not carried out by the business owners themselves;

# F

## Manpower for renewable energy development

Based on a study conducted by Factor AG for GIZ for the Innovation and Investment for Inclusive Sustainable Development (ISED) project in 2020, it is identified that until 2020, there were around 340,073 people working in renewable energy plants throughout Indonesia. Based on the estimation of Factor AG, the number of workers in renewable energy plants will reach 496,405 people for PLT Bioenergy, PLTS and PLTB by 2030. IESR estimates that in the same year there will be around 1,721,435 people working in renewable energy plants, where the PLTS development will accommodate the largest number of workers.

| Renewable energy                 | 2018 - 2020 | 2030 (estimated by Factor) | 2030 (estimated by IESR) |
|----------------------------------|-------------|----------------------------|--------------------------|
| Bioenergy                        | 271,562     | 215,949                    | 125,280                  |
| Photovoltaic System (PLTS)       | 31,071      | 259,877                    | 826,440                  |
| Hydroelectric Power Plant (PLTA) | 28,700      |                            | 445,641                  |
| Geothermal Power Plant (PLTP)    | 7,000       |                            | 99,603                   |
| Wind Power Plant (PLTB)          | 1,740       | 20,579                     | 166,848                  |
| Others                           |             |                            | 57,623                   |
| Total                            | 340,073     | 496,405                    | 1,721,435                |

Table 11 – Manpower requirements  
Source: GIZ

The Indonesian Renewable Energy Society (IRES) conducted interviews with renewable energy developers who have succeeded in building renewable energy power plants. The interview focused on the manpower needs for renewable energy development, from the process of identifying potentials, development, construction to operations. The need for manpower for maintenance activities carried out by other parties and the production of equipment/machines used in the power plants are not part of the interview. The manpower requirements for each project can be seen in the following table:

| Power Plant                      | Pre-construction exploration | Time (Year) | Development / construction (people) | Time (Year) | Operation (people) |
|----------------------------------|------------------------------|-------------|-------------------------------------|-------------|--------------------|
| Biomass Power Plant (PLTBm)      | 20                           | 3           | 250                                 | 2           | 140                |
| Photovoltaic System (PLTS)       | 20                           | 3           | 85                                  | 1           | 15                 |
| Biomass Power Plant (PLTBm)      | 50                           | 3           | 1,100                               | 2           | 41                 |
| Hydroelectric Power Plant (PLTA) | 20                           | 3           | 500                                 | 4           | 50                 |
| Minihidro Power Plant (PLTM)     | 50                           | 3           | 250                                 | 3           | 50                 |
| Geothermal Power Plant (PLTP)    | 1,150                        | 7           | 3,150                               | 3           | 150                |
| Biogas Power Plant (PLTBg)       | 30                           | 1           | 120                                 | 1.5         | 20                 |

Table 12 – The manpower requirements in the renewable energy business process  
Source: IRES (self-processed based on interview results)

From the table above, it can be seen that for each project, PLTP development, both during the exploration and development process, absorbs the most manpower, followed by the construction of PLTB and PLTA. On the other hand, PLTP and PLTBm absorb the most manpower at the time of operation.



## Low carbon development in the energy sector

The government has determined the 2020-2024 RPJMN through Presidential Regulation No. 18 of 2020. The regulation describes targets related to Low Carbon Development, particularly those related to the energy sector and GHG emission reduction as follows:

| AGENDA  | OBJECTIVE  | INDICATOR   | TARGET IN 2019 | TARGET IN 2024 |
|---|--|---|----------------|----------------|
| Strengthen economic resilience for quality economic growth.                 | Fulfilling energy needs by prioritizing increasing New and Renewable Energy (NRE)                      | A. Portion of NRE in the National energy mix.         | 13.4%          | 20%            |
|   |  | B. Primary energy intensity (BOE/billion IDR)         | 141            | 133.8          |
|   |  | C. Final energy intensity reduction (BOE/billion IDR) | 0.9            | 0.8            |
|   |  | D. NRE installed capacity (GW)                        | 10.2           | 19.2           |
| Build the environment, increase resilience to disasters and climate change. | Increase the success of climate change mitigation through the implementation of Low Carbon Development | E. Biofuel utilization for domestic use (million kL)  | 6.9            | 17.4           |
|   |  | A. GHG emissions reduction                            |                | 27.3%          |
|   |  | B. GHG emissions intensity reduction                  |                | 24%            |

Table 13 – The Targets of Energy Sector in the 2020-2024 RPJMN  
Source: Statistics Indonesia (Bappenas)

The Ministry of Energy and Mineral Resources has issued the Minister of Energy and Mineral Resources Regulation No. 16/2020 concerning the Strategic Plan of the Ministry of Energy and Mineral Resources for 2020 - 2024. Based on the Strategic Plan, the MEMR targets aspects related to renewable energy development and the application of energy efficiency as follows:

| NO   | INDICATOR / PARAMETER   | 2020        | 2021        | 2022        | 2023        | 2024        |
|--|---|-------------|-------------|-------------|-------------|-------------|
| <b>Indicator 6 - Provision of NRE Infrastructure - 27.4%</b> |   |             |             |             |             |             |
| a.   | <b>NRE Power Plant Mix to NRE and National Energy General Plan (RUEN) Generating Capacities (%)</b> | <b>24.3</b> | <b>26.5</b> | <b>30.8</b> | <b>34.7</b> | <b>42.9</b> |
|  | <i>NRE Generating Capacity (MW)</i>   | 10,986      | 11,987      | 13,909      | 15,687      | 19,350      |
|  | <i>RUEN Generating Capacity (MW)</i>  | 45,156      | 45,156      | 45,156      | 45,156      | 45,156      |
| b.   | <b>Geothermal Measured Reserve Utilization Ratio (%)</b>  | <b>15.5</b> | <b>16.0</b> | <b>16.9</b> | <b>18.9</b> | <b>21.4</b> |
|  | <i>RUEN Generating Capacity (MW)</i>  | 2,271       | 2,351       | 2,483       | 2,783.0     | 3,158       |
|  | <i>Reserve (MWe)</i>  | 14,651.5    | 14,676.5    | 14,701.5    | 14,726.5    | 14,752      |
| c.   | <b>Ratio of Other Measurable Potential Utilization of NRE for Electricity (%)</b>                   | <b>3.3</b>  | <b>3.6</b>  | <b>4.3</b>  | <b>4.8</b>  | <b>6.1</b>  |
|  | <i>Total Installed Capacity (MWe)</i>   | 8,714.7     | 9,635.8     | 11,425.6    | 12,903      | 16,191.5    |
|  | <i>Hidro (MWe)</i>  | 6,141.2     | 6,581.5     | 7,537.4     | 7,934.3     | 9,885.8     |
|  | <i>Wind (MWe)</i>   | 154.3       | 154.3       | 164.3       | 443.3       | 883.3       |
|  | <i>Solar (MWe)</i>  | 260.6       | 589.4       | 928.5       | 1,571.7     | 2,215.4     |
|  | <i>Ocean (MWe)</i>  | 0           | 0           | 0           | 0           | 0           |
|  | <i>Bio (MWe)</i>  | 2,136       | 2,288       | 2,773       | 2,932       | 3,185       |
|  | <i>Others (Hybrid, Solar Street Lighting (PJTUS), LTSHE, Pump Storage) (MWe)</i>                    | 22.1        | 22.1        | 22.1        | 22.1        | 22.1        |
|  | <i>Total Technical Potentials (MWe)</i>   | 265,433     | 265,933     | 266,433     | 266,933     | 267,433     |



| NO        | INDICATOR / PARAMETER  | 2020       | 2021       | 2022        | 2023       | 2024       |
|-----------|--|------------|------------|-------------|------------|------------|
| <b>d.</b> | <b>Ratio of Utilization fo Biodiesel to Diesel Oil (%)</b>           | <b>100</b> | <b>100</b> | <b>1001</b> | <b>100</b> | <b>100</b> |
|           | <i>Biodiesel Blending Percentage (%)</i>                             | 30         | 50         | 50          | 50         | 50         |
|           | <i>Biodiesel (Thousand kL)</i>                                       | 10,000     | 10,200     | 14,150      | 14,550     | 17,350     |
|           | <i>Diesel (Thousand kL)</i>  | 40,870     | 40,000     | 39,200      | 38,462     | 36,429     |
| <b>e.</b> | <b>Ratio of Utilization of Biogas to RUEN Target (%)</b>             | <b>7.7</b> | <b>8.1</b> | <b>8.5</b>  | <b>9.0</b> | <b>9.4</b> |
|           | <i>Household Communal Biogas Consumption (Million m<sup>3</sup>)</i> | 28.91      | 30.53      | 32.15       | 33.77      | 35.39      |
|           | <i>RUEN Biogas Target (Million m<sup>3</sup>)</i>                    | 376.8      | 376.8      | 376.8       | 376.8      | 376.8      |

Table 14 – Indicators for the provision of NRE infrastructure for 2020 - 2024  
Source: MEMR

| NO   | INDICATOR / PARAMETER  | 2020         | 2021         | 2022        | 2023        | 2024        |
|--|--|--------------|--------------|-------------|-------------|-------------|
| <b>Indicator 1 - Energy Use Efficiency ~ 33.06%</b>        |  |              |              |             |             |             |
| <b>a.</b>  | <b>Final Energy Intensity Reduction (%)</b>  | <b>100</b>   | <b>100</b>   | <b>100</b>  | <b>100</b>  | <b>100</b>  |
|  | • Final Energy Intensity Reduction (BOE/Billion IDR)   | 0.9          | 0.9          | 0.9         | 0.8         | 0.8         |
|  | • Target of Final Energy Intensity Reduction (BOE/Billion IDR)   | 0.9          | 0.9          | 0.9         | 0.8         | 0.8         |
| <b>b.</b>  | <b>Average Fossil-Based Power Plant Efficiency (%)</b>   | <b>78.9</b>  | <b>78.9</b>  | <b>79.4</b> | <b>79.5</b> | <b>80.0</b> |
|  | • Realization of Power Plant Efficiency of PT PLN (Persero) Combined (%)                                 | 32.7         | 32.7         | 33.0        | 33.0        | 33.2        |
|  | • Reference of Power Plant Efficiency of PT PLN (Persero) Combined (%)                                   | 41.5         | 41.5         | 41.5        | 41.5        | 41.5        |
| <b>c.</b>  | <b>Primary Energy Intensity (%)</b>  | <b>100</b>   | <b>100</b>   | <b>1001</b> | <b>100</b>  | <b>100</b>  |
|  | • Primary Energy Intensity (BOE/Billion IDR)   | 139.5        | 138.0        | 136.6       | 135.2       | 133.8       |
|  | • Target of Primary Energy Intensity (BOE/Billion IDR)   | 139.5        | 138.0        | 136.6       | 135.2       | 133.8       |
| <b>d.</b>  | <b>Preparation of the Minimum Energy Performance Standards (MEPS) (%)</b>                                | <b>100</b>   | <b>100</b>   | <b>1001</b> | <b>100</b>  | <b>100</b>  |
|  | • Number of equipment prepared for its MPES (Equipment)  | 3            | 2            | 1           | -           | -           |
|  | • Target equipment prepared for its MPES (Equipment)   | 3            | 2            | 1           | -           | -           |
| <b>Indicator 2 - Sectoral Energy Productivity ~ 23.46%</b> |  |              |              |             |             |             |
| <b>a.</b>  | <b>Industrial Energy Consumption per Industrial GDP without Biomass and Non-Energy (BOE/Billion IDR)</b> | <b>102.5</b> | <b>101.1</b> | <b>99.8</b> | <b>98.5</b> | <b>97.2</b> |
|  | • Industrial Energy Consumption (Thousand BOE)   | 263,896      | 275,508      | 287,630     | 300,286     | 313,496     |
|  | • Industrial GDP (Billion IDR)   | 2,574,957    | 2,724,304    | 2,882,314   | 3,049,488   | 3,226,359   |
| <b>b.</b>  | <b>Commercial Energy Consumption per GDP (BOE/Billion IDR)</b>   | <b>10.7</b>  | <b>10.7</b>  | <b>10.6</b> | <b>10.6</b> | <b>10.5</b> |
|  | • Commercial Energy Consumption (Thousand BOE)   | 49,900       | 52,794       | 55,856      | 59,096      | 62,524      |
|  | • Commercial GDP (Billion IDR)   | 4,650,105    | 4,947,712    | 5,264,365   | 5,601,284   | 5,959,767   |

Table 15 – Indicators of energy use efficiency and productivity of sectoral energy  
Source: MEMR

Based on Table 14 above, the government expects the availability of renewable energy power plants with an installed capacity of 19,350 MW in 2024 or only about 42.9% of the target set in RUEN. The government also targets that the B50 program will be implemented in 2024, with a total biodiesel utilization of 17,350 kL in 2024.

There is a slight difference between the targets of MEMR Strategic Plan and the 2020-2024 RPJMN, particularly in terms of the installed capacity of renewable energy in 2024, which in the 2024 RPJMN is targeted to achieve the installed capacity of renewable energy generation (on grid) of 19.2 GW (See Table 13), while the MEMR Strategic Plan targets an installed capacity of 19.35 GW.

On the other hand, there is no difference between the 2020-2024 RPJMN and the MEMR Strategic Plan in terms of setting primary energy intensity targets, with a target of 133.8 BOE/IDR Billion in 2024 (See Table 15).

| NO                         | INDICATOR / PARAMETER   | 2020        | 2021        | 2022        | 2023        | 2024        |
|----------------------------|---|-------------|-------------|-------------|-------------|-------------|
| <b>GHG Emission - 100%</b> |   |             |             |             |             |             |
| <b>a.</b>                  | <b>GHG Emission from the Energy Sector (% - Max. 100)</b>                                       | <b>100</b>  | <b>99.9</b> | <b>99.6</b> | <b>100</b>  | <b>99.7</b> |
|                            | <i>GHG Emission Reduction from the Energy Sector (Million Tons)</i>                             | 58          | 67          | 91          | 116         | 142         |
|                            | <i>NDC Target Reduction (Million Tons)</i>  | 57.63       | 67.06       | 91.34       | 116         | 142         |
| <b>b.</b>                  | <b>Ratio of NRE Share in Primary Energy Mix to NRE Mix in RUEN (%)</b>                          | <b>58.3</b> | <b>63.0</b> | <b>68.3</b> | <b>77.8</b> | <b>84.8</b> |
|                            | <i>NRE Share in Primary Energy Mix including Modern Biomass (%)</i>                             | 13.4        | 14.5        | 15.7        | 17.9        | 19.5        |
|                            | <i>NRE Mix in RUEN (%)</i>  | 23          | 23          | 23          | 23          | 23          |
| <b>c.</b>                  | <b>GHG Emission Intensity from the Energy Sector (% - Max. 100)</b>                             | <b>100</b>  | <b>99.9</b> | <b>99.6</b> | <b>100</b>  | <b>99.7</b> |
|                            | <i>GHG Emission Reduction Intensity from the Energy Sector (Million Tons)</i>                   | 0.214       | 0.245       | 0.329       | 0.415       | 0.503       |
|                            | <i>GHG Emission Reduction from the Energy Sector (Million Tons)</i>                             | 58          | 67          | 91          | 116         | 142         |
|                            | <i>GHG Emission Reduction Intensity from the Energy Sector based on NDC Target (Ton/person)</i> | 0.21        | 0.24        | 0.33        | 0.41        | 0.50        |
|                            | <i>NDC Target Reduction (Million Tons)</i>  | 57.63       | 67.06       | 91.34       | 115.90      | 142.36      |

Table 16 - GHG emission and fulfillment of energy sector NDC targets  
Source: MEMR

From Table 16 above, based on the 2020-2024 MEMR Strategic Plan, the Ministry of Energy and Mineral Resources is targeting to achieve a reduction in GHG emissions from the energy sector of 142 million tCO<sub>2</sub> by 2024 or around 45.2% of the GHG emission reduction target from the energy sector that must be achieved by 2030. Meanwhile, the RPJMN does not mention a target for achieving GHG emission reduction in tCO<sub>2</sub> by 2024, but it is expected that the overall GHG emission reduction target in 2024 will reach 27.3%; There is no specific target for reducing absolute emissions from the energy sector in the RPJMN by 2024.

In the various FGDs conducted by IRES, various efforts were proposed that could promote low-carbon development for the energy sector, consisting of improving regulations, developing various activities that directly or indirectly have an impact on reducing greenhouse gas emissions, as well as research and development Table 17 below is a summary of various proposals for Low Carbon Development in the energy sector.

Proposed low carbon development in the energy sector

| No       | Activity  | Description  | Fiscal stimulus/incentive required |
|----------|---|--|------------------------------------|
| <b>A</b> | <b>Improved regulations</b>   |  |                                    |
| 1        | Issuance of the RE Law and its derivative regulations   | <ul style="list-style-type: none"> <li>• IRES has submitted input to the House of Representatives (Dewan Perwakilan Rakyat/ DPR) so that the current bill only covers renewable energy, so that the title of the bill should be changed to RE Bill;</li> <li>• The RE Law is expected to be a long-term solution for a more stable regulation, so that investment in renewable energy can be maximized. After the Bill is enacted into the RE Law, the government must immediately finalize the preparation of its derivative regulations, such as Government Regulations, Ministerial Regulations, Presidential Regulations, etc.;</li> </ul> |                                    |
| 2        | Revise Government Regulation No. 70/2009 on Energy Management   | The revision of Government Regulation No. 70/2009 will provide a better and tighter legal basis for the application of energy management;  |                                    |
| 3        | Issuance of a Presidential Regulation on Renewable Energy Prices  | The issuance of the Presidential Regulation is expected to be an intermediate solution until the RE Law is issued. The Presidential Regulation must be able to guarantee business certainty for investors/renewable energy developers  |                                    |
| 4        | Issuance of the Decree of the Minister of Energy and Mineral Resources on the Electricity Supply Business Plan (RUPTL) for 2020-2029 or 2021-2030 | <p>RUPTL is the basis for the provision of renewable energy. The RUPTL is expected to consider the following matters:</p> <ul style="list-style-type: none"> <li>• Prioritizing RE in RUPTL</li> <li>• No new fossil-based power plant will be procured until 2030</li> <li>• Revised 35,000 MW program, in which power plants which are still in planning and procurement process are replaced with renewable energy power plant;</li> <li>• Termination of operation of PLTU Coal and PLTGU which has been operating for &gt; 20 years and PLTD &gt; 15 years</li> </ul>   |                                    |
| 5        | Revise the MEMR Regulation No. 38/2016 by taking into account the enactment of the Job Creation Law that regulates the Electricity Sector         | <p>Revising the MEMR Regulation aims to facilitate the entry of private business entities, Regional-owned Enterprises (BUMD), Village-owned Enterprises (BUMDES), cooperatives or their combination to provide energy in remote regions, border areas, and small inhabited islands that have not been served by PLN.</p> <p>Two major obstacles in the implementation of this Ministerial Regulation are related to the release of the PLN business area to other parties, and the determination of the purchase price of electricity for public</p>   |                                    |
| 6        | Revise the MEMR Regulation No. 10/2017  | By revising this Ministerial Regulation, it is expected that the Power Purchase Agreement (PPA) can share the risk equally between PLN and the developer. With a balanced risk sharing, it will be used as the basis for the preparation of a bankable PPA template for project finance  |                                    |

| No | Activity   | Description   | Fiscal stimulus/incentive required |
|----|--|---|------------------------------------|
| 7  | The establishment of the Renewable Energy Management Agency  |   |                                    |
|    | <ul style="list-style-type: none"> <li>• The government to establish the Renewable Energy Management Agency (<i>Badan Pengelola Energi Terbarukan/BPET</i>);</li> <li>• The main duties and functions of BPET include:               <ul style="list-style-type: none"> <li>o Formulate and implement operational strategies from the policy on the use of Renewable Energy to meet the directions of the National Energy General Plan based on the targets of the National Energy Policy;</li> <li>o Coordinate with relevant agencies/ministries and institutions for the implementation of the strategy;</li> <li>o Coordinatie RE planning and procurement with RE providers;</li> <li>o Establish procurement mechanisms and appoint developers through direct appointment and direct election;</li> <li>o Propose renewable energy prices to be set by the President;</li> <li>o Establish a feed-in tariff mechanism;</li> <li>o Establish a mechanism for applying the renewable portfolio standard;</li> <li>o Issue renewable energy certificates and formulate mechanisms for the application and utilization of renewable energy certificates;</li> <li>o Recommend the use of renewable energy funds, including determining the allocation of the use of renewable energy funds;</li> <li>o Plan and conduct capacity building for stakeholders on Renewable Energy; and</li> <li>o Promote Renewable Energy investment.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• The establishment of BPET is critical to achieve renewable energy targets according to National Energy Policy (KEN);</li> <li>• BPET which will "lead" the renewable energy procurement process, on the one hand will be able to reduce the workload of PLN in terms of generation and Pertamina in terms of biofuel, on the other hand will make the procurement of renewable energy more fair;</li> </ul>  |                                    |
| 8  | The Establishment of a Renewable Energy Fund   |   |                                    |
|    | <ul style="list-style-type: none"> <li>• The government should form a Renewable Energy Fund (<i>Dana Energi Terbarukan/DET</i>), where the funds obtained will be used to finance incentives and compensation for renewable energy development, research and development, development of renewable energy infrastructure in areas that are not yet supplied with electricity, training, socialization</li> </ul>   | <ul style="list-style-type: none"> <li>• Sources of funds for DET come from export levies on energy resources, both renewable and non-renewable energy, carbon levies including fuel excise (prioritized non-subsidized fuel), State Budget (APBN), contributions from energy users, and other legitimate sources.</li> <li>• The justification for the imposition of levies for the export of energy resources is as a trade-off for not utilizing these energy resources for domestic use;</li> </ul> |                                    |

| No | Activity  | Description   | Fiscal stimulus/incentive required   |
|----|---|---|--|
| 9  | Issuance of regulations and implementation of the carbon pricing instrument in the energy sector  |   |  |
|    | <ul style="list-style-type: none"> <li>The government should issue a Presidential Regulation which will be the basis for the implementation of the carbon pricing instrument to reduce GHG emissions from the energy sector and meet the NDC target;</li> </ul>   | <ul style="list-style-type: none"> <li>The application of carbon pricing instruments, if designed properly, will be able to effectively reduce GHG emissions from the energy sector. With the implementation of carbon pricing, the external costs incurred by fossil-based facilities will be internalized. This will be in line with the formulation of Article 7 of Law 30/2007;</li> <li>The main instruments used are carbon emissions and levies trading</li> <li>The application of the carbon pricing instrument requires the imposition of GHG emission reduction obligations for business actors that produce excessive GHG emissions</li> </ul>  |  |
| B  | Electricity and renewable energy  |   |  |
| 1  | Renewable energy procurement and operation  |   |  |
|    | <ul style="list-style-type: none"> <li>RE capacity building in accordance with RUEN and RUPTL;</li> <li>Procurement is carried out by means of a direct appointment mechanism for site-specific renewables and direct selection for non-site specific ones (for certain capacities);</li> <li>Prioritizing and maximizing the use of local renewable energy sources. Regions that have RE sources prioritize energy supply based on these RE sources (for example: North Sumatra, Aceh, Sulawesi rely on PLTA/M. PLTP is also prioritized in areas with oil palm plantations or other agro-agriculture prioritizing waste processing for energy supply;</li> <li>PLTS development, large-scale PLTB in large systems, such as Jamali. For PLTS, the tender is conducted for at least 100 MWp per location with a total of at least 1GW per tender, between 2020 - 2024, and becomes 2GW annually between 2025 - 2030. Large-scale tenders for PLTB are adjusted to potential availability;</li> <li>Stopping all fossil-based generation rent</li> <li>Prioritizing and maximizing the operation of renewable energy (merit orders with renewable energy priorities)</li> <li>Conversion of fossil-based power plants: PLTU, PLTG, PLTGU which have been operating for &gt; 20 years to be replaced with renewable energy power plants</li> <li>Conversion of PLTD owned by PLN which have been operating for &gt; 15 years to be replaced with renewable energy power plants</li> <li>Requiring the use of clean coal technology for each new PLTU construction</li> </ul> | <ul style="list-style-type: none"> <li>Law No. 30/2007 Article 20 Paragraph 3 stipulates that regions that produce energy sources will be prioritized to obtain energy from local energy sources. Meanwhile, Paragraph 4 stipulates that the provision of new and renewable energy must be increased by the Government and regional governments in accordance with their respective authorities. These provisions are an important basis for prioritizing the use of renewable energy in areas where renewable energy sources are available;</li> <li>Government regulation no. 10/2017 which has been amended twice should be revised so that the PPA is bankable for project finance</li> </ul> | <ul style="list-style-type: none"> <li>PLN will get compensation if the price of renewable energy is set higher than the Cost of Generation Provision (Biaya Pokok Penyediaan/BPP) of PLN. The compensation payment is made by the Ministry of Finance after going through a verification process by the Ministry of Energy and Mineral Resources.</li> <li>Provision of tax incentives in the form of a tax holiday of at least 10 years regardless the investment costs, exemption of VAT on procurement of domestic services and goods, exemption of VAT and income tax on imports of machines and power plant parts that have not been produced in Indonesia. The provision of this incentive is conducted through existing mechanisms applicable in BKPM;</li> <li>Provision of interest subsidies for renewable energy investment. The Ministry of Energy and Mineral Resources has proposed the amount of interest subsidy to be provided annually in the State Budget and managed through the Environmental Fund Management Agency (<i>Badan Pengelola Dana Lingkungan Hidup/BPDLH</i>)</li> <li>The government provides State Equity Participation (<i>Penyertaan Modal Negara/PMN</i>) to PLN to replace PLTD owned by PLN with renewable energy-based power plants. PMN is proposed for approval by the DPR;</li> </ul> |

| No | Activity   | Description   | Fiscal stimulus/incentive required  |
|----|--|---|---|
| 2  | Utilization of renewable energy in special areas   |   |   |
|    | <ul style="list-style-type: none"> <li>Require the use of renewable energy in tourist areas</li> <li>Require industrial estates, especially export-oriented ones, to use renewable energy</li> <li>Require the use of renewable energy in the new capital city;</li> <li>Require the use of public vehicles and electric-based private vehicles in the new capital city</li> <li>Require the use of industrial electric stoves in all households in the new capital city area (no more LPG sales)</li> <li>Require all houses/buildings in the new capital city to use Rooftop PV System;</li> <li>Opening opportunities to purchase electricity directly by business actors generated from renewable energy power plants (direct PPA)</li> </ul>  | <ul style="list-style-type: none"> <li>Utilization of renewable energy in tourist areas will be able to attract tourists who are increasingly aware of the importance of sustainable tourism.</li> <li>Utilization of renewable energy in export-oriented industrial estates in the case of insufficient renewable energy so that the source of energy supplies can be combined with PLTGU. It will be able to reduce the product emission of every product produced and exported and will open export opportunities for Indonesian products;</li> <li>Utilization of renewable energy and electricity-based facilities in the new capital city will provide a good example for government support for the energy transition</li> <li>The purchase of renewable energy directly by business actors from renewable energy developers provides opportunities for industry players to fulfill their commitment to full use of renewable energy (RE100). In this case, the distribution of energy can be done using the electricity grid owned by PLN (power wheeling)</li> </ul> | <ul style="list-style-type: none"> <li>Reduction of corporate income tax for companies that use, for example, &gt; 40% RE as their energy source in the industrial area, SEZs and other special areas. The provision of this facility is proposed jointly by the Ministry of Energy and Mineral Resources and the Ministry of Industry;</li> </ul>  |
| 3  | Off-grid, provision of electricity in remote regions, border areas, and small inhabited islands that have not been served by PLN   |   |   |
|    | <ul style="list-style-type: none"> <li>Provision of renewable energy-based electricity by utilizing local energy sources</li> </ul>  | <ul style="list-style-type: none"> <li>The provision of electricity is carried out by private business entities, cooperatives, BUMD or BUMDES, having an impact on the job creation and increasing community income (PLTS, PLTBm, or others)</li> </ul>   | <ul style="list-style-type: none"> <li>Provision of a "Viability Gap Fund" (VGF) to finance a portion of the investment and an "Availability ayment" (AP) to finance part of the O&amp;M costs, or to provide additional village funds to finance part of the O&amp;M costs. The government can allocate funds for VGF and AP and it is managed by BPD LH;</li> </ul>   |
| 4  | Implementation of Renewable Portfolio Standard   |   |   |
|    | <ul style="list-style-type: none"> <li>With the implementation of the Renewable Portfolio Standard (RPS), fossil-based power plants are required to have a portfolio in a certain percentage</li> <li>Encouraging the implementation of co-firing in coal-fired power plants with biomass for all coal-fired power plants which have been operating for &gt; 15 years as part of the RPS implementation;</li> <li>Coal-fired power plants with a contract period of up to 15 years is given the opportunity to reduce energy generated from coal, where the reduction in production is compensated by the opportunity to produce renewable-based energy in the same amount without having to go through the procurement process, which is carried out in the same system as the Coal-fired Power Plant system.;</li> </ul> | <ul style="list-style-type: none"> <li>The implementation of the RPS imposes the responsibility on fossil-based power plant developers to contribute to accelerating the achievement of renewable energy targets. The amount of contribution from fossil energy-based developers is adjusted to the renewable energy target in KEN</li> <li>The co-firing obligation for coal and biomass is only carried out until the PPA for the coal-powered power plants ends, and after the PPA ends, the PLTU operation is also terminated;</li> <li>Renewable energy-based energy production as compensation for reduced fossil-based energy production is carried out at the same price until the PLTU contract period ends, after which the renewable energy power plant contract is automatically extended for a total of 25 years at a price lower than the previous price.</li> </ul>  | <ul style="list-style-type: none"> <li>The government should compensation to PLN in the event of a price increase due to the use of biomass. The Ministry of Energy and Mineral Resources has proposed providing compensation as part of pricing for renewable energy</li> <li>The government should provide tax incentives for the development of renewable energy power plants to compensate for the reduction in fossil energy-based energy production. This fiscal incentive is provided through the existing Minister of Finance Regulation</li> </ul> |
| 5  | Modernization of transmission networks   |   |   |
|    | <ul style="list-style-type: none"> <li>The government allocates a budget for the construction and modernization of transmission and distribution networks;</li> </ul>  | <ul style="list-style-type: none"> <li>Network modernization is needed in order to be able to evacuate energy from an intermittent energy power plant and a different energy utilization pattern with the increasing use of electric vehicles.</li> </ul>   | <ul style="list-style-type: none"> <li>The government should provide PMN to PLN for the construction and modernization of transmission and distribution networks. The Ministry of Energy and Mineral Resources together with the Ministry of BUMN should propose PMN to the Ministry of Finance for approval by the DPR.</li> </ul>   |

| No | Activity                                 | Description   | Fiscal stimulus/incentive required  |
|----|--|---|---|
| 6  | Increased energy demand                  |   |   |
|    | Utilization of electric vehicles         | <ul style="list-style-type: none"> <li>• Production of electric vehicles with a priority on motorbikes, installation of charging in various strategic locations, replacing gas and diesel buses with electric buses</li> <li>• Prioritizing the development of electric motorbikes is necessary given that the domestic production base for motorbikes is already very strong, meanwhile the sales of domestic motorcycle are also quite high;</li> <li>• The development of domestic electric cars and electric buses is still being carried out to encourage the industrialization of electric vehicles</li> <li>• The use of electric vehicles is necessary, in addition to reducing imports of oil and fuel, as well as reducing air pollution</li> </ul> | <ul style="list-style-type: none"> <li>• Fiscal incentives in the form of tax holidays for electric vehicle manufacturers with reference to the existing Minister of Finance.</li> <li>• Granting tax breaks to eliminating VAT and luxury goods taxes for the purchase of electric vehicles through accelerating the implementation of Government Regulation No. 73/2019 concerning Taxable Goods Classified as Luxurious in the form of Motor Vehicles which are Subject to Sales Tax on Luxury Goods and the Minister of Home Affairs Regulation No. 8/2020 concerning Tax Base Calculation for the Imposition of Motor Vehicle Tax and Title Transfer Tax of Motor Vehicle</li> <li>• The Ministry of Industry should propose accelerating the implementation of Government Regulation No. 73/2019 and propose a reduction in tax rates to the Ministry of Finance;</li> <li>• Local governments should impose lower motor vehicle tax imposition on electric vehicles</li> </ul> |
|    | Utilization of induction electric stoves | <ul style="list-style-type: none"> <li>• In addition to encouraging the domestic industry, the production and use of electric induction stove is also to reduce the import of LPG</li> </ul>  | <ul style="list-style-type: none"> <li>• Providing fiscal incentives for induction electric stove producers. The Ministry of Industry should propose to provide fiscal incentives through the issuance of regulations by the Ministry of Finance</li> </ul>   |
| C  | Oil and gas                              |   |   |
|    | Utilization of flared gas                | <ul style="list-style-type: none"> <li>• Depending on the composition, the flared gas can be converted into LPG, dry gas and condensate. It is necessary to conduct an evaluation related to the implementation of the MEMR Regulation No. 32/2017 concerning Utilization and Selling Price of Flared Gas in Upstream Oil and Gas Business Activities, especially regarding the price of flared gas.</li> </ul>   | <ul style="list-style-type: none"> <li>• The price of flared gas should be set as low as possible.</li> <li>• VAT and income tax exemption for the import of machinery and spare parts used for processing flared gas if they have not been produced in Indonesia. The provision of this facility needs to be integrated into the existing regulations on fiscal incentives</li> </ul>  |

| No | Activity   | Description  | Fiscal stimulus/incentive required   |
|----|--|--|--|
| D  | Energy efficiency  |  |  |
|    | <ul style="list-style-type: none"> <li>• Application of energy efficiency on the utilization side               <ul style="list-style-type: none"> <li>○ <b>Industry:</b> The application of the concept of "Industrial Revolution 4.0" (digitization of processes and operational controls to minimize energy consumption,</li> <li>○ <b>Building:</b> towards "net zero" energy consumption in commercial and residential buildings (smart buildings; heat pump applications; smart chillers; innovative building materials; smart building designs that meet the requirements of being "healthy buildings" and energy efficient); services in the field of increasing energy efficiency and utilization of renewable energy (ESCO)</li> <li>○ <b>Mobility/Transportation:</b> decarbonization of transportation/mobility systems (EV, Hybrids, Hydrogen Vehicle; EV components and infrastructure; Rehabilitation and new development of rail-based transportation systems; modernization of the Sea Transportation system; "non-motorized" mobility infrastructure; etc.)</li> <li>○ <b>Household:</b> LED lighting manufacturing; Energy efficient household appliances; Building materials that meet the sustainability criteria; Building design innovations that pay attention to health aspects and the use of renewable energy and energy efficient</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• The application of energy efficiency in various sectors will be able to reduce energy consumption in various sectors</li> </ul> | <ul style="list-style-type: none"> <li>• The Ministry of Energy and Mineral Resources should propose the provision of funding for energy efficiency implementation in various sectors</li> </ul> |



| No | Activity   | Description  | Fiscal stimulus/incentive required  |
|----|--|--|---|
|    | <ul style="list-style-type: none"> <li>• The application of energy efficiency in the energy production and supply side               <ul style="list-style-type: none"> <li>○ <b>Renewable Energy Power Generation, Transmission and Distribution Industry</b> (IPP; Design and Manufacture of RE Power Plant Support Equipment; Software and hardware to support the Smart Grid system.</li> <li>○ <b>Mining and Mineral Processing Industry</b> to optimize higher economic and environmental value (EE in mining operation systems and Smelting Operations)</li> <li>○ <b>Automotive Industry:</b> Super fuel-efficient conventional vehicle components as a transition to full conversion to EV (Production of Clean/ Eco-friendly fuels such as biofuels, green diesel, and bio ethanol; conventional vehicle carbon emission control services; development of new raw materials for vehicle manufacturing to replace steel, non-recycleable plastic material; production of energy efficient marine transport equipment with all its components;</li> <li>○ <b>Non-automotive/non-motor mobility industry</b> to reduce the consumption of fossil-based energy and improve the quality of public health (popularization of bicycle use, development of pedestrian infrastructure in residential clusters and integrated smart cities)</li> </ul> </li> </ul> |  | <ul style="list-style-type: none"> <li>• The Ministry of Energy and Mineral Resources should propose the provision of funding for energy efficiency implementation in various sectors</li> </ul>  |
| E  | Implementation of the Carbon Pricing Instrument  |  |   |
|    | <ul style="list-style-type: none"> <li>• The government applies carbon pricing instruments for the energy sector</li> </ul>  | <ul style="list-style-type: none"> <li>• By applying the instruments of carbon pricing, the cost of externality from the use of fossil-based energy can be internalized</li> <li>• The instruments of carbon pricing in the energy sector is divided into the application of the Emission Trading System (ETS), the mechanism for carbon credits and levies;</li> <li>• ETS is mandatory for facility owners that emit &gt; 25,000 tCO<sub>2</sub> per year;</li> <li>• Each facility that must apply ETS is only permitted to emit a certain amount each year. The determination of the number of permits for each facility is carried out through benchmarking;</li> <li>• If the emissions &gt; are greater than the allowable amount, the business actor must buy additional permits, or buy carbon units produced from voluntary mitigation activities, and if the business actor has excess permits, the business actor can sell the excess permits to parties in need;</li> <li>• The use of BBM is subject to carbon levies</li> </ul> | <ul style="list-style-type: none"> <li>• Carbon levies are imposed at least 2.5% of the selling price of non-subsidized BBM and BBG. The Ministry of Environment and Forestry and the Ministry of Energy and Mineral Resources are proposing the imposition of carbon levies for non-subsidized BBM and BBG to be stipulated through the Ministry of Finance, as well as proposing the use of revenue from these levies;</li> <li>• The price for traded emission permits is determined based on a market mechanism;</li> </ul> |

| No | Activity   | Description  | Fiscal stimulus/incentive required   |
|----|--|--|--|
| F  | R&D and utilization of new technology  |  |  |
|    | <ul style="list-style-type: none"> <li>The government encourages research, development and utilization of low-carbon technologies, such as hydrogen, storage, microgrid, virtual power plants, algae, bioethanol produced from palm oil waste, etc.</li> </ul> | <ul style="list-style-type: none"> <li>If Indonesia is able to have its own technology for low-carbon energy, it will be able to increase Indonesia's energy security at a time when fossil resources are running out</li> </ul> | <ul style="list-style-type: none"> <li>The government should provide fiscal incentives for research, development and utilization of low carbon technologies. The provision of incentives is carried out through the application of the Minister of Finance Regulation (PMK) Number 153 of 2020 concerning Granting of Reduction in Gross Income for Certain Research and Development Activities in Indonesia</li> <li>The government should provide a type of guarantee so that technology developers can obtain funding from banks for research, development and utilization of low emission technology (clean technology funds). The Ministry of Industry and the Ministry of Research and Technology should propose the provision of funding through the state budget and guarantee of funding for funding through banks for technology development and technology market development;</li> </ul> |

Table 17 – Low Carbon Development Proposals  
Source: IRES

# H Proposed Stimuli for Low Carbon Development

In order to achieve the targets set in the RPJMN and MEMR Strategic Plan, especially those related to renewable energy development and implementation of energy efficiency activities, apart from using the State Budget funds, the Government expects support from business actors. On the other hand, with the current conditions, with the COVID 19 pandemic, many activities of business actors face obstacles, even some have stopped. And in order to attract business actors to invest, the Government needs to provide some stimuli.

Provision of stimuli can stimulate economic recovery, particularly with the entry of new domestic and international investment in the energy sector, particularly in renewable energy. In particular, due to the COVID-19 pandemic, many countries and business actors are aware of the importance of using renewable energy so that they allocate significant costs for “green recovery”. For investors, the COVID-19 pandemic is not an obstacle to investing in renewable energy development. For example, this can be seen from the enthusiasm of potential investors to participate in the “market sounding” conducted by PT Indonesia Power, a subsidiary of PT PLN (Persero), in the “Hijaunesia” program. Some potential investors even offered attractive prices for several projects offered for the installation of PLTS. The provision of the stimuli will contribute to the following:

1. Economic recovery through various development activities in the renewable energy sector and energy efficiency;
2. New employment opportunities, especially in areas where renewable energy development and energy efficiency activities are carried out;
3. Increasing the regional economy with development activities as a side effect of developing renewable energy and energy efficiency, among others:
  - a. Provision of building materials for construction from the area around the renewable energy project location;
  - b. Provision of lodging, food and beverages, the needs of workers in the construction of renewable energy plants;
  - c. Community activities as a form of CSR commitment from the company;
4. Reduction in GHG emissions.

The provision of stimuli is focused on activities that have been included in the MEMR Strategic Plan which will accelerate the achievement of the 2020-2024 RPJMN target. The stimuli are also expected to be provided based on existing regulations, but if needed, new regulations that will encourage economic recovery and achievement of the targets for the energy sector should be prepared.

The various stimuli that need to be provided to achieve the targets of the MEMR Strategic Plans and RPJMN, especially for the 2022 Government Work Plan (*Rencana Kerja Pemerintah/RKP*), are as follows:

| Stimuli  | Budget allocation  | Number of supported projects                          | Annual reduction in tCO2 GHG emissions | Employment (people)   | Remarks   |
|--|--|---|--|---|---|
| Tax holiday  | The total investment value is approximately USD 20.5 billion | About 400 projects, depending on capacity per project | 34,450,991 tCO2 per year               | 641,750 people during the construction period and 29,772 people during the operation period |   |
| Tax allowance for 10 years                                     |  |   |  |   |   |
| Import duty exemption  |  |   |  |   |   |
| Non-collected VAT  |  |   |  |   | The value of non-collected VAT is USD 1,333 million   |
| Loan guarantee (USD)   | 111 million  |   |  |   | Assuming the guarantee premium is 1.5% of the loan value, the premium is paid 50% each by the developing government |
| RE development fund (IDR)                                      | 300 billion  | 100   | 1,226,400 – 3,985,800                  | 10,000-30,000   |   |
| Rooftop photovoltaic system (PLTS Atap) development fund (IDR) | 3 trillion   | 200,000   | 204,400                                | 1,000,000   | Require 5 people for the construction of each Rooftop PV system (PLTS Atap)   |
| Dana efisiensi energi (IDR)                                    | 300 billion  | 600   |  |   |   |

Table 18 – The proposed Low Carbon Development stimulus for the 2022 RKP

## H.1. Fiscal incentives for renewable energy development

The government provides fiscal incentives for developing renewable energy based on existing regulations or expanded regulations, in particular in the form of:

1. Exemption from import duty for capital goods and spare parts is implemented based on current policies, however, the policy should be expanded so that the spare parts required during the maintenance of renewable energy-based power plants can take advantage of this facility;
2. Tax holiday of at least 10 years without being limited by the amount of investment. The provision of this facility requires special arrangements;
3. Tax allowance in the form of income tax reduction, acceleration of depreciation and amortization, reduction of income tax for investor dividends, is implemented based on special arrangements;
4. VAT for the procurement of domestic goods and services should not be collected, including for the purchase of raw materials/feedstock for PLTBm as referred to Article 16B of Law No. 8/1983 jo. Law No. 42/2009 (VAT Law). Provision of this facility will reduce the investment burden borne by renewable energy investors. If the Government does not collect the VAT, the free VAT value for 9,050.8 MW to be built until 2024 will be USD 1,371 million.

| Power Plant                      | Target MW | Investment / MW (Million USD) | Total investment (Million USD) | Domestic Component Level (TKDN) | Non-collected VAT (Million USD) |
|----------------------------------|-----------|-------------------------------|--------------------------------|---------------------------------|---------------------------------|
| Hydroelectric power plant (PLTA) | 3,909.80  | 2.3                           | 8,993                          | 75%                             | 674                             |
| Geothermal Power Plant (PLTP)    | 1,027.00  | 5                             | 5,135                          | 65%                             | 334                             |
| Photovoltaic system (PLTS)       | 2,089.40  | 1                             | 2,089                          | 40%                             | 84                              |
| Wind Power Plant (PLTB)          | 729.00    | 2.3                           | 1,677                          | 20%                             | 34                              |
| Bioenergy                        | 1,295.10  | 2                             | 2,590                          | 80%                             | 207                             |
| Total                            | 9,050.30  |                               | 20,484                         |                                 | 1,333                           |

Table 19 – 3 The proposed non-collected VAT stimulus for the 2022 RKP

## H.2. Renewable energy development fund

The provision of renewable energy development funds aims to increase the willingness of Financial Institutions/Banks to provide renewable energy investment funds. Banks/Financial Institutions are usually less interested in funding renewable energy investments because of the low quality of the documents used for applying funding to Banks/Financial Institutions. Due to this condition, the Banks/Financial Institutions do not want to take the risk of providing funding based on the project finance scheme, therefore, they ask investors to provide collateral in the form of assets or corporate guarantees. To help solve this problem, the Government needs to provide funds to improve the quality of RE project development documents.

The funds provided can be accessed by renewable energy developers who already have a feasibility study document and are included in the List of Selected Developers (Daftar Pengembang Terpilih/DPT) at PLN. The funds provided will be used to improve the quality of project documents, particularly the Feasibility Study (FS), Detailed Engineering Design (DED), environmental documents, data acquisition needed to complete the preparation of the FS and DED. With better document quality, the Financial Institutions/Banks can provide the funding required to develop renewable energy projects.

The amount of funds that the Government needs to provide for this activity is IDR 300 billion for 2022, which will be used for 100 renewable energy projects, where each project will get a maximum of IDR 3 billion. Such limitation should be applied since the time needed to select projects until funding approval takes a long time. In order for the selection process to be carried out properly, the Fund Management Institution needs to prepare standard documents that need to be filled in by renewable energy developers applying for funding. These funds will be managed by a Fund Management Institution appointed by the Government.

If each renewable energy project that receives funding has an installed capacity of 10 MW, then the total potential for developing renewable energy with this funding support is 1,000 MW. If the power grid emission factor is assumed to be 0.7 tCO<sub>2</sub>/MW, then the potential for GHG emission reduction is 3,985,800 tCO<sub>2</sub> per year, assuming that the power plants being built are PLTM with a capacity factor of 0.65, whereas if all PLTS are built with a capacity factor of 0.2 then the potential reduction emissions are 1,226,400 tCO<sub>2</sub> per year.

As compensation, the GHG emission reduction generated by the project funded will be purchased by the government at a price of IDR 50,000 per tCO<sub>2</sub>. The developers will submit an emission reduction certificate with a value equal to the funds received, a maximum of 60,000 (equivalent to an emission reduction of 60,000 tCO<sub>2</sub>), to the government. For the excess emission reduction certificate produced, the developer must offer it to the government in advance (first right of refusal) at the market price. But if the government does not take away the right to buy, renewable energy developers can sell certificates to other parties. If a funded project is not built successfully, the funds received by the developer are considered forfeited.

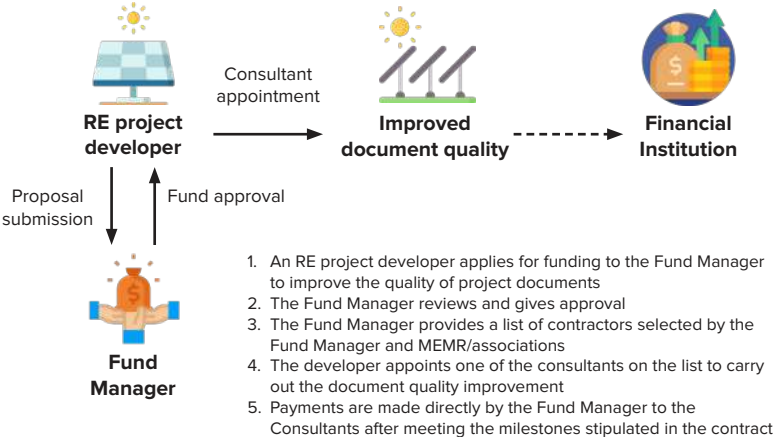


Figure 5 - The process of applying for the Renewable Energy Development Fund

### H.3. Loan guarantee for renewable energy development

Apart from the quality of documents, another thing that becomes an obstacle in developing renewable energy is the reluctance of the Financial Institutions/Banks to provide loans for renewable energy development. This is because there are a lot of renewable energy developments, especially PLTM, that have issues in repaying loans, due to construction and operation that are not in accordance with the design. Provision of loan guarantees combined with improving the quality of renewable energy design documents will be able to encourage loan provision by domestic Financial Institutions/Banks.

Loan guarantees can be provided by Government-owned Guarantee Institutions, such as Jamkrindo or Askrindo, or other Guarantee Institutions. With the total investment needed to build 9,050.80 MW of USD 20.5 billion, a loan ratio of 70% of investment costs and a premium of 1.5% of the loan value, the Government is expected to provide 50% of the guarantee fund, which is USD 108 million or IDR 1,559.3 billion, while the other 50% will be borne by renewable energy developers.

| Power Plant                      | Target MW | Investment / MW (Million USD) | Total investment (Million USD) | Guarantee (Million USD) |
|----------------------------------|-----------|-------------------------------|--------------------------------|-------------------------|
| Hydroelectric power plant (PLTA) | 3,909.80  | 2.3                           | 8,993                          | 47                      |
| Geothermal Power Plant (PLTP)    | 1,027.00  | 5                             | 5,135                          | 27                      |
| Photovoltaic system (PLTS)       | 2,089.40  | 1                             | 2,089                          | 11                      |
| Wind Power Plant (PLTB)          | 729.00    | 2.3                           | 1,677                          | 9                       |
| Bioenergy                        | 1,295.10  | 2                             | 2,590                          | 14                      |
| Total                            | 9,050.30  |                               | 20,484                         | 108                     |

Table 20 – Proposal for the provision of guarantees for the 2022 RKP

The government can reduce the amount of the guarantee considering the following:

- All PLTP developments use loans from international financial institutions;
- It is assumed that only about 40% of PLTA development will use domestic funding, likewise for PLTS and PLTB, it is assumed that only 30% each will use domestic funding.

With this assumption, the installed capacity that will be supported by the guarantee fund will be only 3,704.54 MW with the amount of guarantee that the government needs to provide is USD 38 million or around IDR 557.01 billion.

| Power Plant                      | Target MW | Investment / MW (Million USD) | Total investment (Million USD) | Guarantee (Million USD) |
|----------------------------------|-----------|-------------------------------|--------------------------------|-------------------------|
| Hydroelectric power plant (PLTA) | 1,563.92  | 2.3                           | 8,993                          | 19                      |
| Geothermal Power Plant (PLTP)    | -         | 5                             | -                              | -                       |
| Photovoltaic system (PLTS)       | 626.82    | 1                             | 627                            | 3                       |
| Wind Power Plant (PLTB)          | 218.70    | 2.3                           | 503                            | 3                       |
| Bioenergy                        | 1,295.10  | 2                             | 2,590                          | 14                      |
| Total                            | 3,704.54  |                               | 7,317                          | 38                      |

Table 21 – Guarantee options for renewable energy

### H.4. Revolving fund for the installation of Rooftop Photovoltaic System (PLTS Atap)

PLN is assigned by the Government to provide access to electricity throughout Indonesia. To carry out this assignment, in some regions PLN builds power plants using PLTD, which has an impact on the high Cost of Generation (BPP) in the region (See Table of BPP for Generation per Region). On the other hand, the Electricity Basic Tariff (Tarif Dasar Listrik/TDL) set by the Government for some government customer groups (See Table for Tariff and TDL), does not consider the economic costs (BPP, transmission and distribution costs) that must be borne by PLN. TDL for some households is significantly low, so the government must

provide subsidies for energy supply in certain regions. For example, the BPP in Nias, Mentawai, Maluku Islands, and several other regions is IDR 3,041/kWh, while the TDL that applies nationally for certain groups is IDR 1,551.96. With an average rate of IDR 580.41, the subsidy burden for the Government is IDR 971.55 per kWh, while the shortage of 1,489.04 will be borne by PLN. By comparing the BPP for Power Generation and National TDL and the average rates in the two tables above, it can be seen that for certain regions the government provides a fairly large subsidy for some groups of customers, while PLN has to bear the cost difference between the BPP and the National TDL.

To reduce the subsidies that must be paid while also reduce the burden on PLN in certain regions, the Government can provide funds for the installation of Rooftop PV System for PLN consumers in regions with high BPP. With the Rooftop PV System, the energy supplied by PLN to these customers will be reduced, thus reducing the burden of Government subsidies. Funds will be provided for regions with high Power Generation BPP, such as in Nias, Mentawai, Wamena, Sarma, etc.

| NO | TARIFF GROUP               | AVERAGE TARIFF (IDR/kWh) | AVERAGE BPP + MARGIN (7%) (IDR/kWh) | SUBSIDY (IDR/KWH) |
|----|----------------------------|--------------------------|-------------------------------------|-------------------|
| 1  | S.1 / 220 VA               | 445.63                   | 1,551.96                            | 1,106.33          |
| 2  | S.2 / 450 VA               | 323.35                   | 1,551.96                            | 1,228.61          |
| 3  | S.2 / 900 VA               | 437.86                   | 1,551.96                            | 1,114.10          |
| 4  | S.2 / 1,300 VA             | 719.47                   | 1,551.96                            | 832.49            |
| 5  | S.2 / 2,200 VA             | 770.19                   | 1,551.96                            | 781.77            |
| 6  | S.2 / 3,500 to 200 kVA     | 924.06                   | 1,551.96                            | 627.90            |
| 7  | S.3 > 200 kVa              | 922.25                   | 1,273.33                            | 351.08            |
| 8  | R.1 / up to 450 VA         | 580.41                   | 1,551.96                            | 971.55            |
| 9  | R.1 / 900 VA               | 1,358.89                 | 1,551.96                            | 193.07            |
| 10 | B.1 / up to 450 VA         | 984.75                   | 1,551.96                            | 567.21            |
| 11 | B.1 / 900 VA               | 1,130.04                 | 1,551.96                            | 421.92            |
| 12 | B.1 / 1,300 VA             | 1,551.96                 | 1,551.96                            | -                 |
| 13 | B.1 / 2,200 VA to 5,500 VA | 1,273.33                 | 1,551.96                            | 278.63            |
| 14 | I.1 / 450 VA               | 972.50                   | 1,551.96                            | 579.46            |
| 15 | I.1 / 900 VA               | 1,183.18                 | 1,551.96                            | 368.78            |
| 16 | I.1 / 1,300 VA             | 1,128.86                 | 1,551.96                            | 423.10            |
| 17 | I.1 / 2,200 VA             | 1,273.33                 | 1,551.96                            | 278.63            |
| 18 | I.1 / 3,500 to 14 kVA      | 1,179.78                 | 1,551.96                            | 372.18            |
| 19 | I.2 / 14kVA to 200kVA      | 653.57                   | 1,551.96                            | 898.39            |
| 20 | P.1 / up to 450 VA         | 1,551.96                 | 1,551.96                            | -                 |
| 21 | P.1 / 900 VA               | 1,273.33                 | 1,551.96                            | 278.63            |
| 22 | P.1 / 1,300 VA             | 1,551.96                 | 1,551.96                            | -                 |
| 23 | P.1 / 2,200 VA to 5,500 VA | 815.04                   | 1,551.96                            | 736.92            |
| 24 | T / > 200 kVA              | 815.04                   | 1,273.33                            | 458.29            |
| 25 | C / > 200 kVA              | 1,366.38                 | 1,273.33                            | -93.05            |

Table 22 - Tariff Group and TDL  
Source: MEMR

With an installation cost of around IDR 15,000,000 per kWp, it will generate about 3.5 kWh per day. By taking the example of a S.2/900 VA customer in Nias with a BPP of IDR 3,041 per kWh, TDL of IDR 437.86 per kWh and TDL of IDR 1,551.96 per kWh, there will be a reduction in the government subsidy burden of IDR 3,899.35 per day (3.5 kWh x (IDR 1,551.96 - IDR 437.86)) or IDR 1,423,262.75 per year and PLN expenses of IDR 1,902,248.60 per year. This means that in less than 11 years, without taking bank interest, the investment fees for the installation of Rooftop PV System has returned on investment, while a Rooftop PV System, if properly maintained, can be used for 25 years.

For this program, for 2022 the Government may allocate a funding of IDR 3,000,000,000,000 which will be used for the installation of Rooftop PV System with a capacity of 1 kWp each in 200,000 houses, prioritizing

areas with high BPP, for example > IDR 2,500 per kWh. The total capacity of the Rooftop PV System built is 200 MWp. Assuming the production per day is 3.5 kWh/kWp, then the production from 200 MWp is 700,000 kWh/day or 255,500 MWh/year. Assuming an emission factor of 0.8 tCO<sub>2</sub>/MWh (considering that the installation of Rooftop PV System is used in areas that still use PLTD), the reduction in greenhouse gas emissions from this investment will reach 204,400 tCO<sub>2</sub> per year.

| No | Region / Distribution / System / Subsystem                 | BPP       |   |       |
|----|--|-----------|---|-------|
|    |  | (IDR/kWh) | (IDR/kWh)   |       |
| 1  | Nias   | 3,0141    | 34 Timika   | 2,736 |
| 2  | Mentawai Islands   | 3,0141    | 35 Tambora (Bima and Sumbawa)                         | 2,733 |
| 3  | Enggano Island   | 3,0141    | 36 Halmahera (Tobelo, Malifut, Jailolo, Sofifi, Maba) | 2,693 |
| 4  | Other subsystem – Sumatra                                  | 3,0141    | 37 BANGKA   | 2,681 |
| 5  | Panjang Island   | 3,0141    | 38 Bacan  | 2,674 |
| 6  | Karimun Jawa   | 3,0141    | 39 Simeuleu Island                                    | 2,650 |
| 7  | Madura Isolated  | 3,0141    | 40 Merauke  | 2,593 |
| 8  | Bawean   | 3,0141    | 41 Timor  | 2,588 |
| 9  | Gili Ketapang  | 3,0141    | 42 Western Florest                                    | 2,504 |
| 10 | Other subsystem – Java Bali                                | 3,0141    | 43 Senana   | 2,486 |
| 11 | Other subsystem – Nusa Tenggara                            | 3,0141    | 44 Fak Fak  | 2,483 |
| 12 | Other subsystem – Kalimantan                               | 3,0141    | 45 Selayar  | 2,445 |
| 13 | Daruba   | 3,0141    | 46 Lluwuk   | 2,403 |
| 14 | Tual   | 3,0141    | 47 Biak   | 2,389 |
| 15 | Dobo   | 3,0141    | 48 Saumlaki   | 2,384 |
| 16 | Sarmi  | 3,0141    | 49 Bau-Bau  | 2,369 |
| 17 | Wamena   | 3,0141    | 50 Kendari  | 2,321 |
| 18 | Tanah Merah  | 3,0141    | 51 Weh Island   | 2,303 |
| 19 | Kaimana  | 3,0141    | 52 Ternate-Tidore                                     | 2,299 |
| 20 | Raja Ampat   | 3,0141    | 53 Anambas  | 2,267 |
| 21 | Other subsystem – Maluku and Papua                         | 3,0141    | 54 Natuna   | 2,239 |
| 22 | Eastern Flores   | 3,031     | 55 Nabire   | 2,191 |
| 23 | Buru   | 3,019     | 56 Jayapura   | 2,162 |
| 24 | Ambon  | 3,010     | 57 Tanjung Balai Karimun                              | 2,110 |
| 25 | Other subsystem – Sulawesi                                 | 2,994     | 58 Lombok   | 2,044 |
| 26 | Saparua  | 2,993     | 59 Manokwari  | 2,018 |
| 27 | Seram  | 2,971     | 60 Northern Sulawesi (Manado, Gorontalo, Kotamobagu)  | 1,918 |
| 28 | Sumba  | 2,964     | 61 Bintuni  | 1,812 |
| 29 | Tahuna   | 2,929     | 62 BELITUNG   | 1,799 |
| 30 | Toli-Toli  | 2,894     | 63 Bintan   | 1,786 |
| 31 | Serui  | 2,882     | 64 South Kalimantan and Central Kalimantan            | 1,682 |
| 32 | Teminabuan   | 2,783     | 65 ACEH   | 1,673 |
| 33 | Three Islands (Nusa Penida, Nusa Lembingan, Nusa Ceningan) | 2,762     | 66 Riau and Riau Islands                              | 1,655 |

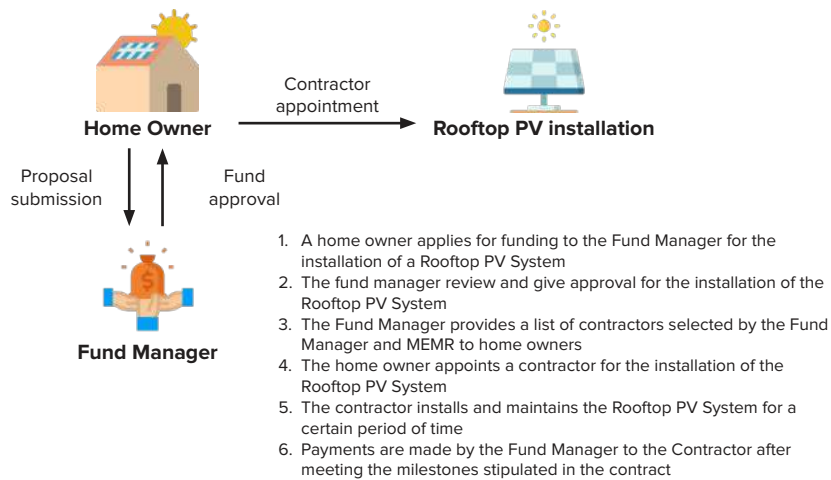
Table 23 - Power Generation BPP per region  
Source: MEMR

With an installation cost of around IDR 15,000,000 per kWp, it will produce about 3.5 kWh per day. Taking the example of a S.2/900 VA customer with a TDL of IDR 437.86 per kWh in an area with a BPP of IDR 1,551.96 per kWh, there will be a reduction in subsidies of IDR 1,423,262.75 per year. This means that in less than 11 years, without taking bank interest into account, the investment costs for installing Rooftop PV System has returned, while a Rooftop PV System, if properly maintained, can be used for 25 years.

For this program, the government can allocate funding for 200,000 sets per year, or a total capacity of 200 MWp, with a total cost of IDR 3,000,000,000,000. Assuming the production per day is 3.5 kWh/kWp, then



the production from 200 MWp is 700,000 kWh/day or 255,500 MWh/year. Assuming an emission factor of 0.8 tCO<sub>2</sub>/MWh (for diesel), the reduction in greenhouse gas emissions from this investment will reach 204,400 tCO<sub>2</sub> per year.



## H.5. Funding for energy efficiency improvements for SMEs through People’s Business Credit (Kredit Usaha Rakyat/KUR)

As can be seen in Table 5, the results of the energy audit conducted by the Director General of New, Renewable Energy and Energy Conservation previously indicated that energy efficiency activities in most companies could be carried out at a cost of less than IDR 1 billion. Even some of the energy efficiency activities can be carried out at no cost (See Appendix 2: Examples of energy efficiency activities in various industries).

SMEs are one of the many business actors affected by the pandemic. Many SMEs face difficulties due to reduced income, making the ability to pay for operating costs more difficult. To ease the burden on SMEs, one of the way is by reducing energy costs.

The Government can provide loans through People’s Business Credit (Kredit Usaha Rakyat/KUR) with an interest rate of 6%, which includes guarantees by the Government-owned Guarantee Agency. The amount of KUR that can be provided for each company is a maximum of IDR 500 million, in accordance with the limits that can be provided by banks. Provision of funding for energy efficiency activities can be integrated with the stimulus provided by the Government as part of the National Economic Recovery.

# I Job creation through provision of stimulus

The provision of various stimuli will be an enabler to low-carbon development, particularly the development of renewable energy and the implementation of energy efficiency activities. Not only for achieving the targets of RPJMN and Strategic Plan of Ministry of Energy and Mineral Resources, it will also create new jobs.

The provision of fiscal incentives in the form of tax holidays, non-collected VAT, provision of tax allowances and combined with provision of loan guarantees will be able to improve the economics of renewable energy plants so that they can compete with fossil-based power plants.

| Power Plant                      | Target MW       | Manpower during the construction (People) | Manpower during the construction (People/MW) | Manpower during the operation (People) | Manpower during the operation (People/MW) |
|----------------------------------|-----------------|---|--|--|---|
| Hydroelectric power plant (PLTA) | 3,909.80        | 262,000                                   | 67   | 6,550                                  | 1.7                                       |
| Geothermal Power Plant (PLTP)    | 1,027.00        | 266,000                                   | 5,135259                                     | 2,850                                  | 2.8                                       |
| Photovoltaic system (PLTS)       | 2,089.40        | 15,750                                    | 8  | 1,575                                  | 0.8                                       |
| Wind Power Plant (PLTB)          | 729.00          | 33,000                                    | 45   | 600                                    | 0.8                                       |
| Bioenergy                        | 1,295.10        | 65,000                                    | 50   | 18,200                                 | 14.1                                      |
| <b>Total</b>                     | <b>9,050.30</b> | <b>641,750</b>                            |  | <b>29,775</b>                          |   |

Table 24 – Job creation

Meanwhile, the provision of renewable energy development funds for 100 projects can create jobs for 10,000 people - 30,000 people, assuming that these funds are used for the development of PLTS or Mini-hydro Power Plant (PLTM) with a capacity of up to 10 MW. It is estimated that the PLTS construction will require around 100 people during the construction period (1 - 1.5 years), while the PLTM construction will require around 300 people during the construction period (2 - 3 years).

Provision of funds for the construction of Rooftop PV System for 200,000 house can create a lot of jobs. Assuming that the installation of each Rooftop PV System requires about 5 people for logistics and installation work, the provision of these funds will be able to create as many as 1,000,000 jobs.

# Appendix 1: Examples of energy utilization and production activities in various industries

## Pemanfaatan energi

1. Industry:
  - a. The application of the concept of “Industrial Revolution 4.0” (digitization of processes and operational controls to minimize energy consumption);
  - b. investment in more energy efficient equipment;
2. Building
  - a. towards “net zero” energy consumption in commercial and residential buildings (smart buildings);
  - b. heat pump applications;
  - c. smart chillers;
  - d. utilization of innovative building materials;
  - e. smart building designs that meet the requirements of being “healthy buildings” and energy efficient;
  - f. development of services in the field of increasing energy efficiency and utilization of renewable energy (ESCO)
3. Mobility/Transportation
  - a. decarbonization of transportation/mobility systems (EV, Hybrids, Hydrogen Vehicle; EV components and infrastructure);
  - b. Rehabilitation and new development of rail-based transportation systems;
  - c. modernization of the Sea Transportation system;
  - d. “non-motorized” mobility infrastructure; etc
4. Household:
  - a. Utilization of LED lighting;
  - b. Utilization of energy efficient household appliances;
  - c. Building materials that meet the sustainability criteria;
  - d. Building design innovations that pay attention to health aspects and the use of renewable energy and energy efficient.

## Energy production and supply:

1. Renewable Energy Power Generation, Transmission and Distribution Industry
  - a. Design and Manufacture of RE Power Plant Support Equipment;
  - b. Software and hardware to support the Smart Grid system.
2. Mining and Mineral Processing Industry
  - a. to optimize higher economic and environmental value (EE in mining operation systems and Smelting Operations)
3. Automotive Industry
  - a. Super fuel-efficient conventional vehicle components as a transition to full conversion to EV (Production of Clean/Eco-friendly fuels such as biofuels, green diesel, and bio ethanol);
  - b. conventional vehicle carbon emission control services;
  - c. development of new raw materials for vehicle manufacturing to replace steel, non-recycleable plastic material; production of energy efficient marine transport equipment with all its components;
4. Non-automotive/non-motor mobility industry
  - a. to reduce the consumption of fossil-based energy and improve the quality of public health (popularization of bicycle use, development of pedestrian infrastructure in residential clusters and integrated smart cities)

## Appendix 2 : Examples of energy efficiency activities in various industries

### Agro-Industry

| Company Name | Energy Saving Measures | Energy Consumption |                       | Thermal Energy Consumption |                      | Potential Energy Saving |                   |                      | Implementation Cost (IDR) | Criteria             |
|--------------|------------------------|--------------------|-----------------------|----------------------------|----------------------|-------------------------|-------------------|----------------------|---------------------------|----------------------|
|              |                        | KWh/Year           | IDR/Year              | KWh/Year                   | IDR/Year             | KWh/Year                | % kWh             | IDR/Year             |                           |                      |
| PT A         | 1                      | 464,960            |                       | 69,543,544                 | 34,771,771,950       | 695,435                 | 1.00              | 580,187,500          | 1.00                      | No Cost              |
|              | 2                      |                    |                       | 1,112,044,108              |                      | 30,739,638              | 2.76              | 862,277,200          | 2.76                      | Moderate Cost        |
|              | 3                      |                    |                       | 52,785,258                 | 26,392,629,150       | 2,111,410               | 4.00              | 1,055,705,166        | 4.00                      | No Cost              |
|              | <b>SUB TOTAL</b>       | <b>464,960</b>     | -                     |                            |                      | <b>33,546,483</b>       | <b>7.76</b>       | <b>2,498,169,866</b> | <b>7.76</b>               | <b>1,000,000,000</b> |
| PT B         | 1                      |                    |                       |                            |                      |                         |                   |                      |                           | No Cost              |
|              | 2                      |                    |                       |                            |                      |                         |                   |                      |                           | No Cost              |
|              | 3                      |                    |                       |                            |                      |                         |                   | 6,000,000,000        |                           | High Cost            |
|              | <b>SUB TOTAL</b>       | <b>23,016,480</b>  | <b>14,960,712,000</b> |                            |                      | <b>9,230,769</b>        | <b>40.11</b>      | <b>6,000,000,000</b> | <b>40.11</b>              | <b>2,000,000,000</b> |
| PT C         | 1                      | 2,759,400          | 1,884,363,600         |                            |                      | 2,759,400               | 100.00            | 1,884,363,600        | 100.00                    | No Cost              |
|              | 2                      | 690,200            | 381,717,200           |                            |                      | 207,060                 | 6.00              | 11,556,765           | 3.03                      | No Cost              |
|              | 3                      | 240,000            | 105,360,000           |                            |                      | 24,000                  | 10.00             | 10,536,000           | 10.00                     | Moderate Cost        |
|              | <b>SUB TOTAL</b>       | <b>240,000</b>     | <b>103,360,000</b>    |                            |                      | <b>2,990,460</b>        | <b>116.00</b>     | <b>1,906,456,365</b> | <b>113.03</b>             | <b>20,000,000</b>    |
| PT D         | 1                      |                    |                       | 2,155,039                  | 1,526,000,000        | 109,000                 | 50.00             | 763,000,000          | 1.00                      | Moderate Cost        |
|              | 2                      |                    |                       |                            | 567,800              |                         | 4.00              | 386,104,000          | 4.00                      | Moderate Cost        |
|              | 3                      |                    |                       |                            |                      |                         |                   |                      |                           | No Cost              |
|              | <b>SUB TOTAL</b>       |                    |                       | <b>2,155,039</b>           | <b>1,526,567,800</b> | <b>109,000</b>          | <b>54.00</b>      | <b>1,149,104,000</b> | <b>5.00</b>               | <b>900,000,000</b>   |
| PT E         | 1                      | 4,519,200          | 2,937,480,000         |                            |                      | 903,744                 | 20.00             | 722,995,200          | 24.61                     | Moderate Cost        |
|              | 2                      |                    |                       | 3,823,522,410              | 106,232,000,000      | 38,235,224              | 1.00              | 1,062,320,000        | 1.00                      | Moderate Cost        |
|              |                        | <b>SUB TOTAL</b>   | <b>4,159,200</b>      | <b>2,937,480,000</b>       | <b>3,823,522,410</b> | <b>106,232,000,000</b>  | <b>39,138,968</b> | <b>21.00</b>         | <b>1,785,315,200</b>      | <b>25.61</b>         |
|              |                        | 28,240,640         | 18,003,552,000        | 3,825,677,449              | 107,758,567,800      | 85,015,681              | 239               | 13,339,045,431       |                           | -                    |

Source: MEMR

Paper and glass industry

| Company Name | Energy Saving Measures | Electrical energy Consumption |                       | Thermal Energy Consumption |                   | Potential Energy Saving |                      |               | Implementation Cost (IDR) |                      |
|--------------|------------------------|-------------------------------|-----------------------|----------------------------|-------------------|-------------------------|----------------------|---------------|---------------------------|----------------------|
|              |                        | KWh/Year                      | IDR/Year              | KWh/Year                   | IDR/Year          | % kWh                   | IDR/Year             | % IDR         | No cost                   | Moderate cost        |
| PT A         | 1                      | 2,278,290                     | 1,000,169,310         | -                          | -                 | 227,289                 | 100,016,931          |               | 0                         |                      |
|              | 2                      | 2,508,420                     | 1,101,196,380         | -                          | -                 | 376,263                 | 165,179,457          |               | 0                         |                      |
|              | 3                      | 50,230                        | 22,050,970            | -                          | -                 | 50,230                  | 22,050,970           |               |                           | 60,000,000           |
|              | 4                      | 240,000                       | 105,360,000           | -                          | -                 | 24,000                  | 10,536,000           |               |                           | 20,000,000           |
|              | 5                      |                               |                       |                            |                   |                         |                      |               |                           | 0                    |
|              | <b>Total</b>           | <b>5,076,940</b>              | <b>2,228,776,660</b>  |                            |                   | <b>678,322</b>          | <b>297,783,358</b>   | <b>13.36%</b> |                           | <b>80,000,000</b>    |
| PT B         | 1                      | 30,404                        | 18,344,516            |                            |                   | 30,404                  | 18,344,516           | 100%          |                           | 60,000,000           |
|              | 2                      | 58,750                        | 35,544,960            |                            |                   | 5,875                   | 3,554,496            | 10%           |                           | 11,000,000           |
|              | 3                      | 9,676,800                     | 5,854,464,000         |                            |                   | 967,680                 | 585,446,400          | 10%           |                           | 640,000,000          |
|              | 4                      | 146,628                       | 88,710,285            |                            |                   | 20,528                  | 12,419,440           | 14%           |                           | 20,000,000           |
|              | 5                      | 52,992                        | 32,060,160            |                            |                   | 14,307                  | 8,556,243            | 27%           |                           | 30,000,000           |
|              | 6                      |                               |                       | 99,683                     | 21,107,950        | 34,889                  | 21,107,950           | 100%          |                           | 5,000,000            |
|              | <b>Total</b>           | <b>9,965,574</b>              | <b>6,029,123,922</b>  | <b>99,683</b>              | <b>21,107,950</b> | <b>1,073,684</b>        | <b>649,429,045</b>   | <b>10.67%</b> |                           | <b>806,000,000</b>   |
| PT C         | 1                      | 1,987,200                     | 1,351,296,000         |                            |                   | 397,440                 | 270,259,200          | 20            |                           | 648,000,000          |
|              | 2                      | 201,400                       | 136,952,000           |                            |                   | 26,182                  | 17,803,760           | 13            |                           | 40,792,500           |
|              | 3                      | 252,720                       | 171,849,600           |                            |                   | 63,180                  | 42,881,152           | 25            |                           | 100,000,000          |
|              | <b>Total</b>           | <b>2,441,320</b>              | <b>1,660,097,600</b>  |                            |                   | <b>486,802</b>          | <b>331,025,360</b>   | <b>19.94%</b> |                           | <b>788,792,500</b>   |
| PT D         | 1                      | 967,680                       | 428,811,520           |                            |                   | 96,768                  | 42,881,152           | 10            |                           | 95,000,000           |
|              | 2                      | 4,147,000                     | 1,820,620,800         |                            |                   | 1,548,000               | 697,572,000          | 37.33         | 0                         |                      |
|              | 3                      | 2,255,040                     | 989,962,560           |                            |                   | 311,040                 | 136,546,560          | 13.8          |                           | 150,000,000          |
|              | 4                      | 361,453                       | 158,678,165           |                            |                   | 361,453                 | 158,678,165          | 100           |                           | 200,000,000          |
|              | 5                      | 7,795,005                     | 3,422,202,195         |                            |                   | 1,559,001               | 684,440,439          | 20            |                           | 1,600,000,000        |
|              | 6                      |                               |                       | 226,950                    | 34,871,000        | 3,971                   | 12,205,000           | 5             | 0                         |                      |
|              | 7                      |                               |                       | 1,140                      | 175,000           | 399                     | 175,000              | 100           | 0                         |                      |
|              | 8                      |                               |                       | 2,268                      | 348,000           | 794                     | 348,000              | 100           | 0                         |                      |
|              | 9                      |                               |                       |                            | 1,646,000         | 3,749                   | 1,646,000            | 100           |                           | 50,000,000           |
|              | <b>Total</b>           | <b>29,339,904</b>             | <b>12,884,305,656</b> | <b>241,068</b>             | <b>37,040,000</b> | <b>3,885,175</b>        | <b>1,734,492,316</b> | <b>13.13%</b> |                           | <b>2,000,000,000</b> |
| PT E         | 1                      | 16,951,680                    | 7,441,787,520         |                            |                   | 326,592                 | 143,373,000          | 100           | 0                         |                      |
|              | 2                      | 751,680                       | 329,251,000           |                            |                   | 100,680                 | 44,251,000           | 14            |                           | 50,000,000           |
|              | 3                      | 380,160                       | 166,890,240           |                            |                   | 380,160                 | 166,890,240          | 100           |                           | 210,000,000          |
|              | 4                      | 9,590,400                     | 4,210,185,000         |                            |                   | 1,918,080               | 842,037,000          | 20            |                           | 2,200,000,000        |
|              | 5                      | 256,608                       | 112,650,912           |                            |                   | 128,304                 | 56,325,456           | 50            |                           | 200,000,000          |
|              | 6                      |                               |                       | 84,960                     | 37,382,400        | 84,960                  | 37,382,400           | 100           |                           | 100,000,000          |
|              | 7                      |                               |                       | 20,709                     | 9,111,960         | 20,709                  | 9,111,960            | 100           |                           | 20,000,000           |
|              | 8                      |                               |                       | 16,992                     | 7,476,480         | 16,992                  | 7,476,480            | 110           |                           | 20,000,000           |
|              | <b>Total</b>           | <b>27,930,528</b>             | <b>12,260,764,672</b> | <b>122,661</b>             | <b>53,970,840</b> | <b>2,976,477</b>        | <b>1,306,847,536</b> | <b>10.61%</b> |                           | <b>2,800,000,000</b> |

Source: MEMR

Metal, cement and manufacturing industry

| NO | COMPANY | ENERGY SAVING MEASURES | TOTAL ENERGY CONSUMPTION |                   | POTENTIAL ENERGY SAVING |                | Implementation Cost (IDR) | Criteria |
|----|---------|------------------------|--------------------------|-------------------|-------------------------|----------------|---------------------------|----------|
|    |         |                        | KWh/Year                 | IDR/Year          | KWh/Year                | IDR/Year       |                           |          |
| 1  | PT A    | 1                      |                          |                   | 89,424                  | 53,654,400     | 95,000,000                | LC       |
|    |         | 2                      |                          |                   | 22,359                  | 13,415,688     | 284,958,000               | LC       |
|    |         | 3                      |                          |                   | 5,136,917               | 3,082,150,090  | -                         | NC       |
|    |         | <b>SUB TOTAL</b>       | 102,738,336              | 61,643,001,800    | 5,248,700               | 3,149,220,178  | 379,958,000               |          |
| 2  | PT B    | 1                      |                          |                   | 2,619                   | 2,352,360      | 20,000,000                | LC       |
|    |         | 2                      |                          |                   | 8,694,472               | 5,519,730,340  | 10,000,000,000,000        | HC       |
|    |         | 3                      |                          |                   | 5,216,683               | 3,311,838,204  | 12,000,000,000,000        | HC       |
|    |         | 4                      |                          |                   | 8,694,472               | 5,519,730,340  | -                         | NC       |
|    |         | <b>SUB TOTAL</b>       | 173,889,444              | 110,394,606,800   | 22,609,246              | 14,353,651,244 | 22,020,000,000            |          |
| 3  | PT C    | 1                      |                          |                   | 6,342,249               | 3,952,172,524  | 50,000,000                | LC       |
|    |         | 2                      |                          |                   | 6,900,286               | 4,299,913,337  | 50,000,000                | LC       |
|    |         | 3                      |                          |                   | 97,692                  | 60,876,770     | 50,000,000                | LC       |
|    |         | 4                      |                          |                   | 10,266,300              | 6,379,444,845  | 1,500,000,000             | HC       |
|    |         | 5                      |                          |                   | 208,811                 | 130,120,699    | 500,000,000               | HC       |
|    |         | <b>SUB TOTAL</b>       | 464,720,714              | 288,479,746,290   | 23,815,338              | 14,840,528,176 | 2,150,000,000             |          |
| 4  | PT D    | 1                      |                          |                   | 467,080                 | 9,180,000,000  | 345,000                   | LC       |
|    |         | 2                      |                          |                   | 4,406,400               | 220,320,000    | 250,000                   | LC       |
|    |         | 3                      |                          |                   | 1,998,511               | 1,498,880,000  | 600,000                   | LC       |
|    |         | 4                      |                          |                   | 1,948,800               | 350,760,000    | -                         | NC       |
|    |         | 5                      |                          |                   | 121,042                 | 1,089,600,000  | 60,000                    | LC       |
|    |         | <b>SUB TOTAL</b>       | 47,418,757               | 24,032,570,000    | 8,941,834               | 12,339,560,000 | 1,255,000                 |          |
| 5  | PT E    | 1                      |                          |                   | 1,550,000               | 1,054,000,000  | 5,000,000                 | NC       |
|    |         | 2                      |                          |                   | 149,807                 | 101,868,930    | 66,000,000                | LC       |
|    |         | 3                      |                          |                   | 116,064                 | 78,923,520     | 10,000,000                | LC       |
|    |         | <b>SUB TOTAL</b>       | 44,903,108               | 29,784,497,995    | 1,815,871               | 1,234,792,450  | 81,000,000                |          |
| 6  | PT F    | 1                      |                          |                   | 1,890,000               | 1,177,753,500  | 2,750,000,000             | HC       |
|    |         | 2                      |                          |                   | 3,902,128               | 2,431,611,063  | 50,000,000                | LC       |
|    |         | 3                      |                          |                   | 11,710                  | 5,544,000,000  | 1,500,000,000             | HC       |
|    |         | 4                      |                          |                   | 11,235                  | 2,210,000,000  | 2,000,000,000             | HC       |
|    |         | <b>SUBTOTAL</b>        | 596,273,048              | 627,872,769,293   | 5,815,063               | 11,363,364,563 | 6,300,000,000             |          |
|    |         | <b>GRAND TOTAL</b>     | 1,429,943,407            | 1,142,207,192,178 | 68,246,063              | 57,281,116,611 | 30,932,213,000            |          |

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# PAGE PARTNERSHIP FOR ACTION ON GREEN ECONOMY

Indonesia has made significant progress in mainstreaming green economy activities into the country's macroeconomic and national development plans. The country has also increased their global climate commitments – including setting a net zero emissions target by 2060. However, the energy sector in Indonesia remains the country's second-largest carbon emitter, with national power generation being highly dependent on fossil fuels – particularly coal. As such, energy transition is a critical mechanism to achieving Indonesia's climate targets and green economy ambitions.

Energy transition will, however, create significant employment changes in the energy and electricity sectors. In the face of such changes, developing a supportive policy ecosystem to enable future green jobs growth and to ensure a Just Transition is critical. This green jobs policy readiness assessment aims to develop a baseline perspective of current green jobs and Just Transition policy frameworks in Indonesia, with a focus on the energy sector. To this end, the report explores recommendations for measures aimed at supporting the labour market, from both the supply and demand sides, as well as for overarching measures that will promote the enabling environment needed to ensure a Just Transition process.

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