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BUILD BACK BETTER

LOW CARBON DEVELOPMENT

GREEN RECOVERY ROADMAP INDONESIA 2021–2024

Building Back Better Low Carbon Development Post-COVID19

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Foreword

Entering 2020, Government of Indonesia has strengthened its commitment towards green economy, by incorporating low carbon and climate resilience development as its priorities in the National Medium-Term Development Plan (RPJMN) for 2020–2024. This is a big milestone for Indonesia as it is the first time that green aspects and indicators were included in our national development plan.

However, as we began moving towards a more sustainable development pathway, we are challenged by the COVID-19 Pandemic. The pandemic has caused disruption and sharply lowered Indonesia's economic throughout 2020 and 2021. This situation consequently impedes the implementation of our national development plan and will eventually affect the achievement of our long-term national goals.

In this regard, the Government needs to take strategic steps to respond this issue. We are aware that current crisis that previously considered as only health issue, is cross-sectoral problem that requires a systemic and integrated approach to overcome it. One such strategy is encouraging transformation to drive economic growth trajectory, while protecting long-term welfare, livelihoods, and the environment through Green Economy. Green economy is one of the major national structural transformation strategies that will be undertaken as the next step for post-recovery.

With all those consideration in mind, we believe green economy should be placed at the core of development plan to achieve our long-term vision. This belief comes from the principles of green economy which will increase investment in physical capital, technologies, and human capital while also preserving natural capital sustainability. Implementing all those principles will enables Indonesia to achieve sustainable economic growth.

As an initial step towards structural transformation toward green economy, green recovery as our crisis response should be used as a bridge, to assist us in addressing the current economic crisis while investing our resources into green sectors that will yield various economic, social, and environmental benefits in the future. In collaboration with NDC Partnership, GIZ, UN PAGE, and WRI Indonesia, Government of Indonesia has analysed the possibility of implementing green recovery measures and transitioning towards green economy through this document to achieve that goal.

We also express our appreciation to ministries and other stakeholders who have supported the process of developing this document. Hopefully, this document can become a common reference to provide insights as how we could implement green recovery and what are the challenges that need to be addressed.

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September 2021

Medrilzam
Director of Environmental Affairs
Ministry of National Development Planning

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Acronyms

ARIMA	Autoregressive Integrated Moving Average
BAPPENAS	Ministry of National Development Planning
BLT	Direct Cash Assistance
BTS	Bromo-Tengger-Semeru
BPPT	Agency for the Assessment and Application of Technology
C	Carbon
CPCL	Prospective Farmers and Prospective Land
GHG	Greenhouse Gas
GSI	Greenness of Stimulus Index
KLHK	Ministry of Environment and Forestry
KPUPR	Ministry of Public Works and Public Housing
kWh	kilo watt Hour
kWp	Peak power of a PV system or panel
LKPP	National Public Procurement Agency
LCDI	Low Carbon Development Initiative
LPDB	Revolving Fund Management Institution
MCSME	Ministry of Cooperatives and Small and Medium Enterprises
MoEF	Ministry of Environment and Forestry
MoI	Ministry of Investment
MoPWH	Ministry of Public Work and Housing
MSME	Micro, Small and Medium Enterprise
NDC	Nationally Determined Contribution
ODP	People Under Monitoring
PDP	Patients Under Surveillance
PEN	National Economic Recovery Program
PV	Photovoltaic
RKP	Government Work Plan
Rp	Indonesian rupiah
RPJMN	The Medium-Term National Development Plan
RUEN	Rencana Umum Energi Nasional
RUK	Proposed Plan of Activities
t	tonnes
TPA	Final Processing Site
TPS	Terminal Petikemas Surabaya (Waste Terminal)
USD	United States Dollars
VAT	Value Added Tax

Executive Summary

There is a critical need for economic stimulus initiatives in Indonesia to help the nation recover from the impacts of the COVID19 pandemic. Green recovery initiatives (those that not only revive growth and create jobs but also reduce carbon dependency, protect ecosystems, and alleviate poverty) have a substantial role to play. Green recovery initiatives can enable strong economic growth and sustain and create jobs for middle-and-low-income earning families and are better for the environment, notably climate change mitigation and adaptation, biodiversity conservation, and healthy cities.

This Roadmap serves to deliver two key post-COVID green recovery ***Outcomes***. The first outcome is to see green recovery initiatives acknowledged as priorities in Indonesia's national development planning and budgeting processes. The second outcome is that there are sufficient funding pathways secured to sustain longer-term green economy development.

A key challenge is that under current circumstances, green recovery initiatives are not prioritised in Indonesia's post-COVID19 economic stimulus program, and more generally, in Indonesia's national budgeting processes. During the pandemic, the Indonesian government allocated Rp 744.75 trillion (over 2020 and 2021) for COVID19 impact management and a National Economic Recovery fund (PEN). Out of this amount, the allocation for low carbon development initiatives was Rp 7.03 trillion or less than 2% of the total pandemic response budget.

There are five main reasons why green recovery initiatives are not prioritised in the Indonesian national budgeting processes. First, green economy initiatives are generally perceived as longer-term and, thus, inherently less urgent. Second, the Indonesian government's financial resources are limited, particularly in this time of crisis. Third, there are weak inter- and intra-sectoral and ministerial synergies that constrain the development and funding of green recovery initiatives. Fourth, there is limited political pressure on Indonesia's legislative body to value green economy principles. Fifth, the PEN has not prioritised green recovery initiatives.

This Roadmap sets out a framework to address these ***challenges*** to prioritising green recovery initiatives in the Indonesian national budgeting processes. Five ***strategies*** are presented to address the five challenges (listed in Table 2). An ***action plan*** is proposed in Table 3 to enact the strategies. The action plan includes ***12 actions*** and eight corresponding ***milestones***. The action plan is to be implemented over four phases from ***2021 (Respond), 2022 (Recovery), 2023 (Recovery and Re-evaluate) and 2024 (Reward)***. The action plan includes a ***Stakeholder Engagement Plan*** (Table 4) and three sector-specific ***pilot projects*** (Table 5).

The first pilot project is in the waste sector. The initiative provides stimulus for 7,500 waste sector micro, small and medium enterprises through the soft loans and safeguard programs to develop waste management performance improvements. The second pilot project is in the energy sector and involves installing rooftop solar panels on 70 government buildings up to 14MW installed capacity in total (with the option to extend to more government buildings). The third pilot project aims to increase the productivity of plantation crops, increase the income level of farmers through the provision of direct cash assistance at a time when crops have not yet produced, and reduce the negative impacts of deforestation driven by smallholder farmers trying to improve their agricultural yields. In total, these three pilot projects should sustain and create more than 300,000 jobs in the next three years and avoid more than 400 million tCO_2e over 25 years.

1 Context

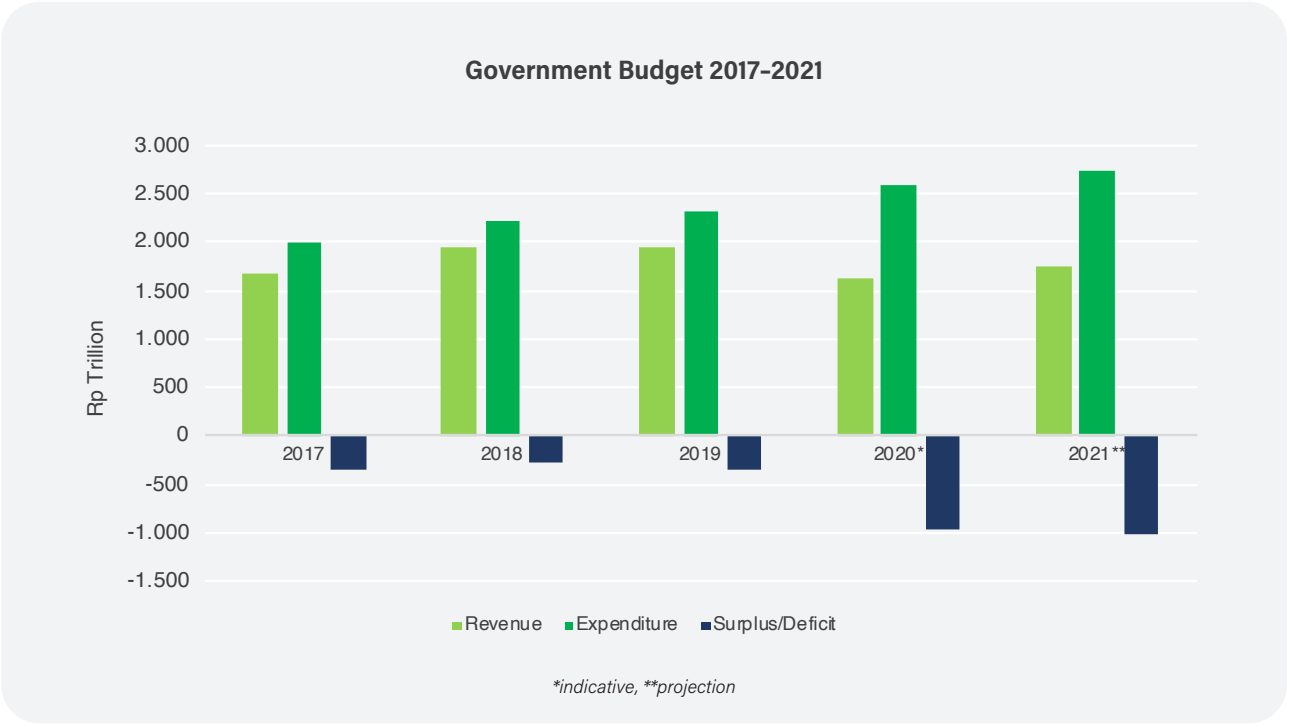
1.1 Stock - Impacts of COVID19 on the Indonesian Economy

1.1.1 Fiscal Contraction and Economic Recession

The COVID19 pandemic has dramatically impacted the Indonesian economy and will continue to affect the nation in 2021 and beyond. Economic growth has been influenced by the intensity of the pandemic and the effectiveness of government response, particularly regarding vaccination rollout and policies for economic stimulus (Faisal and Misbah, 2021). The economic recovery process of other countries, particularly close trading partner countries, will also influence the Indonesian economic recovery.

The COVID19 pandemic has ravaged the Indonesian state budget. State revenue has contracted very sharply from Rp 2.2 thousand trillion before the pandemic to Rp 1.7 thousand trillion in 2020, and it is projected to be Rp 1.8 thousand trillion in 2021 (MOF 2021). If the government fails to manage the impacts of COVID19, the fiscal downturn in 2020 and 2021 will compound into a more severe economic recession. On the expenditure side, instead of improving efficiency and effectiveness of the budget, Government Expenditures increased by Rp 2.7 thousand trillion in 2020 and Rp 2.8 thousand trillion in 2021, further stressing the Indonesian economy (MOEF 2021). COVID19 and its impacts have intensified in Indonesia through 2020 and particularly into 2021. The government has also had difficulty maintaining the rate of poverty due to reduced employment opportunities. As a result, Indonesia entered an economic recession in 2020 as it experienced negative economic growth in the second quarter (-5.32%), in the third quarter (-3.49%), and in the fourth quarter (-2.19%). However, in the first quarter, there was a growth of +2.97%. In general, the Indonesian economy in 2020 experienced a 2.07% contraction compared to 2019 (Faisal and Misbah, 2021).

Figure 1. State Budget Position 2017 to 2021



(Source: Ministry of Finance 2017–2021, processed by FITRA, reported in Faisal and Misbah, 2021)

1.1.2 Widening Budget Deficit

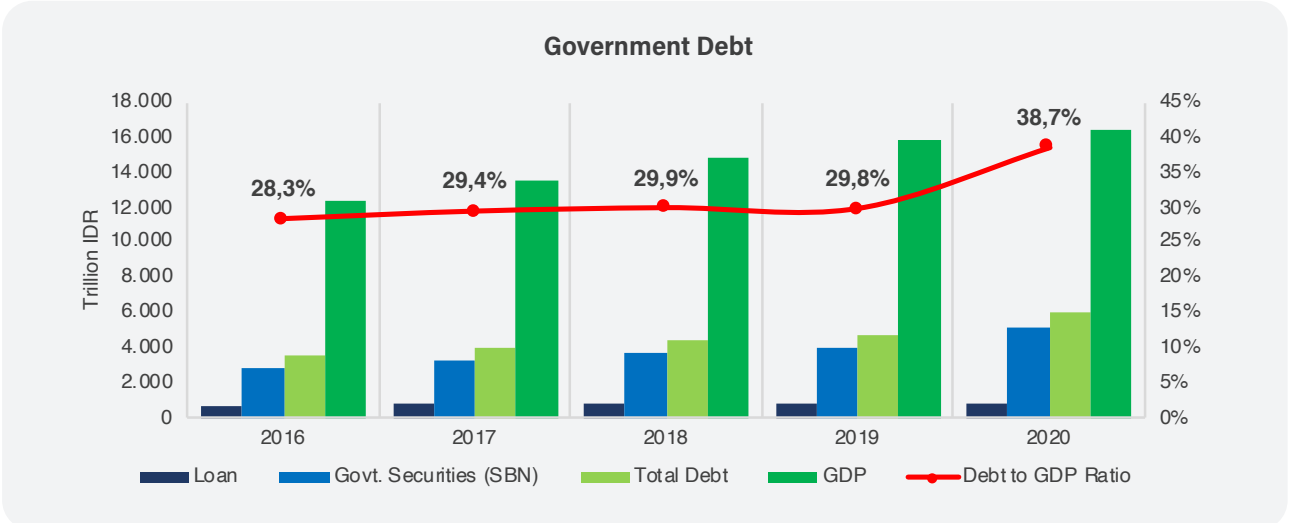
The COVID19 pandemic has increased the state budget deficit. Before the pandemic (2017–2019), the budget deficit was an average of Rp 320.0 trillion or about 2.18% of GDP (MOEF 2021). During the pandemic, the 2020 state budget deficit rose significantly from Rp 307.2 trillion or 1.76% of GDP (2019) to Rp 852.9 trillion or 5.07% of GDP in the first revision of the 2020 state budget (Perpres 54/2020). It rose again to Rp 1,039.2 trillion or 6.34% of GDP in the second revision of the 2020 state budget (Perpres 72/2020). In 2021, the state budget forecasts state revenue will be Rp 1,743.6 trillion, while state expenditures will be Rp 2,750.0 trillion. This will result in a budget deficit in the 2021 state budget to reach Rp 1,006,4 trillion or 5.7% of GDP (Faisal and Misbah, 2021).

Before the pandemic, the Indonesian government had rather limited fiscal capacity due to considerable debt, interest payment burdens, and compulsory spending obligations (e.g., education and healthcare). In addition, expenditure for goods and services in various ministries and agencies have not been effective (MOEF 2021). Subsidies and social assistance targets have often been miscalculated due to data limitations. Corruption cases relating to the use of social assistance funds have further complicated problems of perception and the progress of budget implementation (MOEF 2021). Moreover, the annual unspent budget of various ministries remains substantial. The consequence is a reduction in the effectiveness of government program outcomes, compounding problems stemming from already constrained funding (Faisal and Misbah, 2021).

1.1.3 Increased Public Debt

Another impact of COVID19 and ongoing policy concern is debt outsourcing, the majority of which comes from the sale of Government Securities (SBN). The government has positioned debt financing as a fiscal policy instrument to accelerate the handling of COVID19 and the National Economic Recovery Program (PEN) (BAPPENAS 2021a). Debt financing skyrocketed from Rp 402.1 trillion in 2019 to Rp 1,225.5 trillion in 2020, with debt financing plans of Rp 1,142.5 trillion in 2021 (BAPPENAS 2021a; BAPPENAS 2021b; BAPPENAS 2021c; Kementerian 2021). As of December 2020, the government's debt position had reached Rp 6,074.5 trillion with a debt-to-GDP ratio of 38.68% (Faisal and Misbah, 2021).

Figure 2. Trend in Government Debt for Fiscal Years 2016 to 2020



(Source: Ministry of Finance 2016–2020, processed by FITRA, reported in Faisal and Misbah, 2021).

On 17 June 2021, the World Bank approved a loan of US$500 million (Rp 7.05 trillion) to expand Indonesia's COVID19 response efforts to mitigate the threats posed by COVID19, strengthen the preparedness of its health system, and support the government's free vaccination program. This new loan will further burden the state budget in addition to the average annual debt interest expenditures of Rp 329.19 trillion, equivalent to 19% of total state revenue, or 12% of total state expenditures in 2021 (Faisal and Misbah, 2021).

1.1.4 The Low Carbon Development Scenario

Prior to the COVID-19 Pandemic, emission reduction potential from low carbon development actions submitted by the line ministries is on-track with development targets, about 22.6% in 2018 and 23.46% in 2019. However, due the COVID-19 Pandemic, various low carbon development actions during 2020 was halted, resulted in the cutback of emission reduction potential to 24,13%, below its target of 26%. This is caused by the reallocation of state budget to handle the COVID-19 pandemic, resulted in reduction of budget to implement low carbon development actions. If economic recovery activities post COVID-19 Pandemic is not accompanied by increased efforts in implementing low carbon development actions, it is estimated that greenhouse gas emissions might rebound in the coming years during the national economic recovery phase.

Therefore, it is necessary to start implementing green recovery measures during these times, by pushing the low carbon development actions as one of the central pillars for national economic recovery. In 2019, the Indonesian government launched the Low Carbon Development Initiative, which proposes three low carbon development initiatives (LCDI) scenarios until 2045. These were derived using system dynamics modelling (BAPPENAS 2021b, BAPPENAS 2021c). The three scenarios are the 'LCDI moderate', the 'LCDI high', and the 'LCDI-plus' scenarios. These scenarios presented necessary foundations that could assist Indonesia in implementing green economic recovery.

The LCDI 'moderate' scenario is an effort by the Indonesian government to achieve the unconditional national climate targets set out in the Nationally Determined Contributions (NDC), namely 29% fewer emissions by 2030 relative to the baseline. Under this scenario, the total investment required was estimated to be USD 14.8 billion per year from 2020 to 2024 (approximately 1.15% of GDP) and USD 40.9 billion per year from 2025 to 2045 (1.39% of GDP) (BAPPENAS 2021c). In addition, meeting Indonesia's current unconditional NDC requires: (1) a full, immediate enforcement of forest, peat land, mangrove, and mining moratoria; (2) the undertaking of significant efforts in restoration and emissions avoidance from forests not currently under moratorium; (3) the achievement of agriculture productivity enhancements and other food and waste emissions reduction policies; and (4) the acceleration of reductions in energy intensity relative to historical trends and faster and more effective movement towards renewable energy targets that have already been defined in Indonesia's energy policy (BAPPENAS 2021b, BAPPENAS 2021c).

Compared to the baseline, the LCDI 'high' scenario leads to a 43% emissions reduction by 2030. This is consistent with Indonesia's efforts to achieve the conditional national climate target (NDC) of 41% emissions reduction by 2030. Under the LCDI High Scenario, total average investments needs were estimated at USD 446.5 billion (34.6% of GDP) for the period 2020–2024. Out of those total investments, about USD 21.9 billion per year correspond to specific low carbon development capital spending identified in this report for 2020–2024. The additional LCDI High Scenario investments would thus represent about 2.3% of GDP through 2045. (BAPPENAS 2021b, BAPPENAS 2021c). Meeting the conditional NDC requires completing all the actions in LCDI Moderate Scenario and the scaling up of steps in restoration, forest protection, energy intensity reduction, and an increase in renewable energy shares through 2045.

The LCDI 'plus' scenario includes the High-CRP for 2020 to 2024 and the implementation of additional

ambitious policies thereafter. This scenario incorporates extra efforts in developing low carbon policies starting around 2025 so that emissions continue to fall until 2045 and beyond. This scenario requires a series of actions not currently considered in the RPJMN, such as introducing mechanisms to set carbon prices, more reforestation targets, different policies for energy efficiency improvements, and waste reduction. These actions would primarily be implemented at the urban level; they would be part of a new generation of policies to be implemented beyond the RPJMN 2020–2024 and would require transformational changes in government, the private sector, and civil society in general (BAPPENAS 2021b, BAPPENAS 2021c).

1.1.5 Structural Economic Transformation

Short-term impacts of the COVID-19 Pandemic will result in long-term multi-dimensional consequences for Indonesia. Before the pandemic, the average annual economic growth necessary for Indonesia to escape the middle-income trap by 2036 is 5.7% per year. However, due to the economic impacts caused by the pandemic, even 6% per year average annual growth will only enable us to escape the middle-income trap by 2043 (Bappenas, 2021). As a response to this exercise, Bappenas has initiated the Structural Economic Transformation to shift our economic growth towards a more productive sector while also increasing productivity in existing sectors. To achieve this, six strategies were proposed as its focus which are: (1) competitive human resources, (2) economic sector productivity, (3) green economy, (4) digital transformation, (5) integration of domestic economy, and (6) enabling conditions.

The LCDI 'moderate' scenario can be the most realistic response that is in line with structural transformation towards green economy, in response to the current downturn of the Indonesian economy. LCDI can boost short-term job creation and create long-term opportunities for economic growth. Nonetheless, this pathway will also face challenges as government policies are currently tackling the COVID19 pandemic through the National Economic Recovery program (PEN). The government budget is presently mobilised and directed primarily to finance programs that directly and immediately impact the economy, without consideration of long-term environmental consequences, and the containment of the pandemic. Therefore, while the current short-term economic response is not fundamentally supporting green economic recovery, it is expected to grow in the upcoming years during the medium and long terms, considering green economy's inclusion as one of Indonesia's six structural economic transformation strategies.

1.2 What are Green Recovery Principles?

What is the difference between the terms Green Recovery and Green Economy?

Green recovery principles apply to short-term recovery from major economic disruptions. Green economy principles underpin green recovery and apply to longer-term systemic economic reform, that will support a transition to a more sustainable global economy.

There is a critical need for economic stimulus initiatives in Indonesia to help the national economy recover from the impacts of the COVID19 pandemic both in the short and longer term. The short-term budgeting priorities are vaccination and health care. However, in the medium and longer terms, there is a need for initiatives that stimulate sustained economic growth. Green recovery initiatives have a substantial role to play. Green recovery initiatives enable strong economic growth and sustain and create jobs for middle-and-low-income earning families and are better for the environment, notably regarding key environmental issues such as climate change, biodiversity conservation, and healthy cities (Barbier, 2010). This Roadmap provides a plan to mainstream green recovery principles into the Indonesian post-COVID19 economic recovery plan.

In his seminal work 'A Global Green New Deal: Rethinking the Economic Recovery' Edward Barbier (2010) explained why green economy principles were essential in economic recovery planning: "Reviving growth and creating jobs should be essential objectives (of economic recovery). But policies should also aim to reduce carbon dependency, protect ecosystems, and water resources, and alleviate poverty. Otherwise, economic recovery today will do little to avoid future economic and environmental crises". A green economic recovery prioritises and incorporates these green economy principles into its stimulus plans. Many countries, such as the United States, United Kingdom and those in the European Union have already prioritised green recovery principles in their post-COVID19 budgeting process. Green recovery principles ensure that the funding countries use to recover from economic recessions invest in cleaner production, renewable energy, better land-use practices, and healthier cities. Green recovery initiatives are supported by the United Nations and the Organisation for Economic Co-operation and Development (OECD) (Barbier, 2010).

The Green Economy Coalition describes five essential green economy principles (Barbier, 2010). These can be used as criteria to define green economy projects in Indonesia (Table 1). The first principle states how green economy initiatives must enable all people to create and enjoy prosperity. These initiatives should prioritise investment and access to sustainable natural systems, infrastructure, knowledge, and education. They should also offer opportunities for green enterprises and jobs. Second, a green economy should promote equity within and between generations. It should take a long-term perspective on the economy, creating wealth and resilience that serve the interests of future people while also acting urgently to tackle today's multi-dimensional poverty and injustice. Third, a green economy safeguards, restores and invests in nature by protecting, growing, and restoring biodiversity, soil, water, and air. Fourth, a green economy should support sustainable consumption and production: an inclusive green economy is low-carbon, resource-conserving, diverse and circular. Fifth, a green economy should be guided by accountable and resilient institutions. It should build financial systems that prioritise wellbeing and sustainability.

Table 1. Criteria to Define Green Economy Initiatives in Indonesia
(developed from Green Economy Coalition, 2021)

For initiatives to be classed as 'green economy' initiatives in the green recovery post COVID19, they should comply with all the 15 criteria listed in this table. Whilst these criteria were not used in the design of the initiatives described in Section 3 of the roadmap, those initiatives do (retrospectively) comply. The following table can be used in future green recovery plan-ning in Indonesian to conceptualize, develop, and assess initiatives for inclusion in the green recovery.

Principle	Criteria	Checklist
1. The Wellbeing Principle Green economy initiatives include all people to create prosperity.	Is the initiative people-centered?	Yes/No
	Does the initiative focus on growing wealth that will support the wellbeing of people and communities?	Yes/No
	Does the initiative create opportunities for green livelihoods, enterprises, and jobs?	Yes/No
2. The Justice Principle Green economy initiatives promote equity within and between generations.	Is the initiative inclusive and non-discriminatory?	Yes/No
	Does the initiative take a long-term perspective on the economy, creating wealth and resilience that serve the interests of future citizens while also act-ing urgently to tackle today's multi-dimensional poverty and injustice?	Yes/No
	Does the initiative empower MSMEs, social enterprises, or sustainable liveli-hoods?	Yes/No
3. The Planetary Boundaries Principle Green economy initiatives safeguard restores and invests in nature.	Does the initiative recognize and nurture nature's diverse values?	Yes/No
	Does the initiative invest in protecting, growing, and restoring biodiversity, soil, water, air, and natural systems?	Yes/No
	Does the initiative involve innovative approaches to managing natural sys-tems, informed by their properties such as circularity, and aligning with local community livelihoods based on biodiversity and natural systems?	Yes/No
4. The Efficiency and Sufficiency Principle Green economy initiatives are geared to support sustainable consumption and production.	Is the initiative low-carbon and resource-conserving?	Yes/No
	Does the initiative embrace new models of economic development that ad-dress the challenge of creating prosperity within planetary boundaries?	Yes/No
	Does the initiative align prices, subsidies, and incentives with actual costs to society and benefit those who deliver inclusive green outcomes?	Yes/No
5. The Good Governance Principle Integrated, accountable, and resilient institutions guide green economy initiatives.	Is the initiative evidence-based?	Yes/No
	Does the initiative promote devolved decision-making for local economies and management of natural systems while maintaining strong centralized stand-ards, procedures, and compliance systems?	Yes/No
	Does the initiative build a financial system to deliver well-being and sustainabil-ity, set up in ways that safely serve the interests of society?	Yes/No

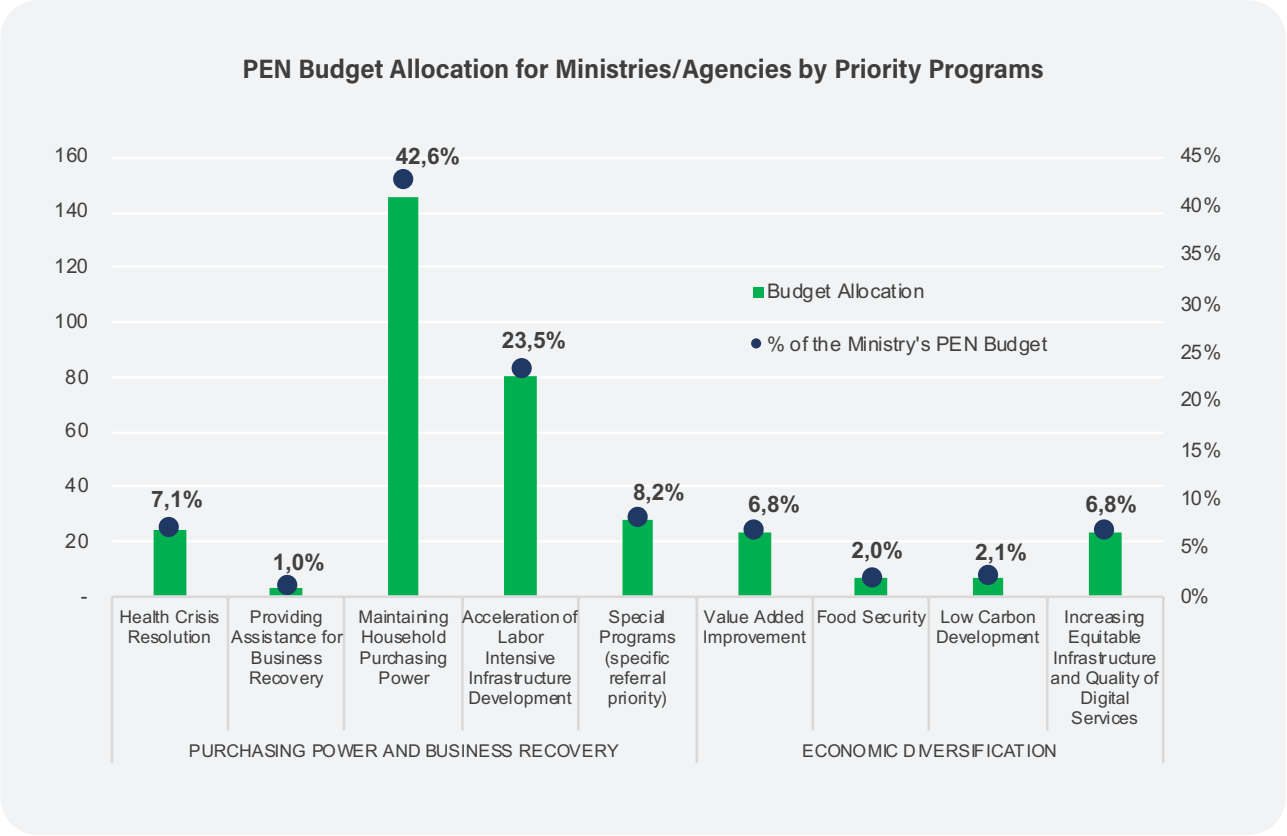
1.3 Challenges in Implementing Green Recovery during the COVID19 Pandemic

1.3.1 Green Recovery Funding is a Low Priority in National Economic Recovery Program

During the pandemic, the government allocated a budget for COVID19 impact management and National Economic Recovery (PEN) of Rp 699.43 trillion in 2020 and increased that to Rp 744.75 trillion in 2021. The PEN budget was used to various programs (Figure 3), namely: (1) Health from Rp 97.26 trillion in 2020 to Rp 214.95 trillion in 2021; (2) Social Protection from Rp 234.33 trillion in 2020 down to Rp 187.84 trillion in 2021; (3) Micro, Small and Medium Enterprises (MSMEs) and Corporations from Rp 177.03 trillion in 2020 down to Rp 161.20 in 2021; (4) Business Incentives from Rp 120.60 trillion in 2020 to Rp 62.83 trillion in 2021; and (5) the Ministry's Priority Program from Rp 65.97 trillion in 2020 to Rp 117.94 trillion in 2021 (Figure 3, BAPPENAS, 2021a).

Specifically, the PEN budget for K/L priority programs is divided into two categories. First, restoring public and business purchasing power includes addressing the health sector crisis, assisting business recovery, maintaining household purchasing power, accelerating labour-intensive infrastructure development, and specifically directed programs. Second is economic diversification, including increasing added value, food security, low-carbon development, and increasing infrastructure distribution and the quality of digital services.

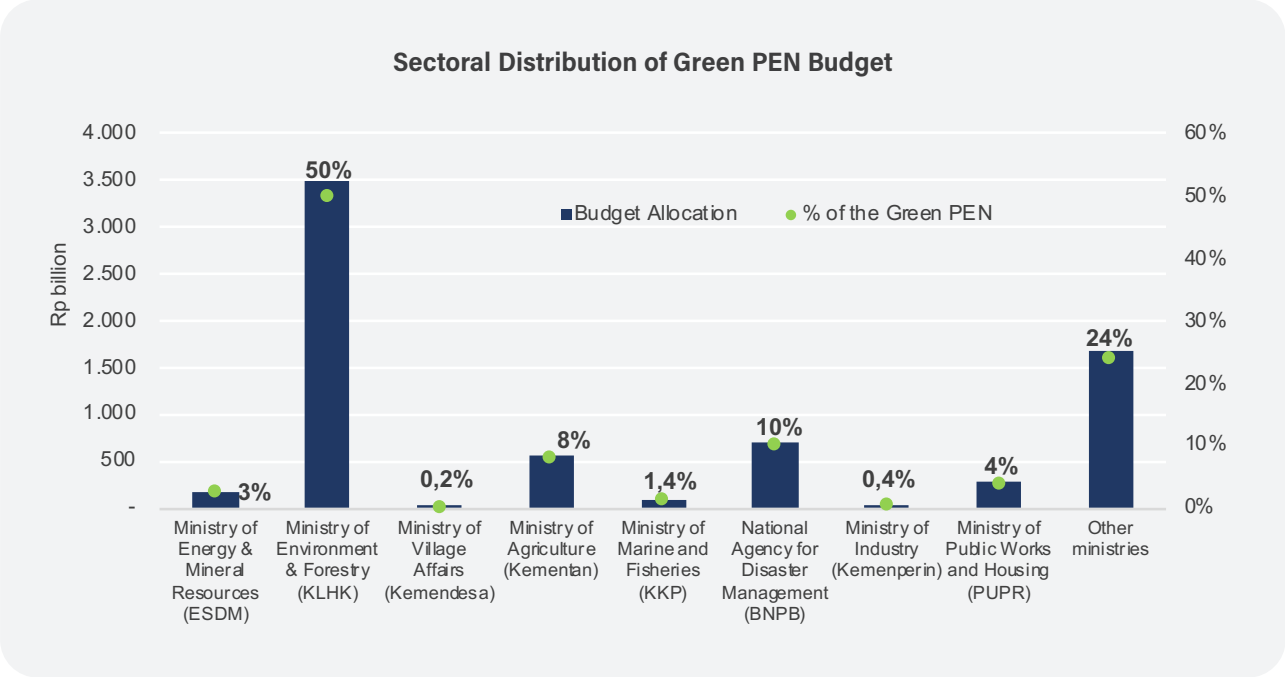
Figure 3. Details of Ministries and Agencies Priority Program Outputs in the 2021 PEN



Source: (BAPPENAS, 2021a).

Figure 4 shows that the budget allocation for low carbon development in the PEN is small compared to the allocations for other activities. The budget allocation for low carbon development is Rp 7.03 trillion or less than 2% of the total K/L PEN budget. This budget is managed by several ministries, including the Ministry of Energy and Mineral Resources; the Ministry of Environment and Forestry; the Ministry of Villages Development of Disadvantaged Regions and Transmigration; the Ministry of Agriculture; the Ministry of Marine Affairs and Fisheries; the National Standardization Agency; the Ministry of Health; Agency for the Assessment and Application of Technology, and other ministries (BAPPENAS, 2021a).

Figure 4. PEN Budget Allocation for Low Carbon Development



Source: (BAPPENAS, 2021a).

The following two case studies – one of the Mangrove Cluster Planting Initiative, and one of a Hazardous COVID19 Medical Waste Management Initiative – are examples of initiatives that have gained funding and been implemented in the past year. In addition, they offer an insight into the types of green recovery initiatives that have been successfully implemented.

Case Study: Mangrove Cluster Planting Initiative

Although green recovery initiatives have received less attention by decision makers in response to the COVID19 pandemic, one initiative that has received funding (Rp 1.43 trillion) from Indonesia's National Economy Recovery (PEN) program is the Mangrove Cluster Planting initiative, administered by the Ministry of Environment (KLHK) and the Ministry of Maritime Affairs and Fisheries (KKP). The PEN budget for the Mangrove Planting initiative aims to fund the replanting of 17,241 ha of watersheds spread over 34 provinces. Most of the budget is allocated to mangrove planting in four provinces: Mahakam Berau watershed in East Kalimantan and North Kalimantan (1,393 ha); the Barito watershed in South Kalimantan (1,090 ha); the Sampara watershed in Southeast Sulawesi (1,062 ha); and the Kahayan watershed in Central Kalimantan (1,057 ha). Other watersheds cover less than 100 ha of planting (e.g., Ketahun watershed in Bengkulu, the Agam Kuantan watershed in West Sumatra, and the Unda Anyar watershed in Bali) (MOEF, 2020).

The program reported that 2020 planting targets had been achieved (MOEF, 2021). The initiative is designed to abate carbon and involve local communities. Local involvement empowers small-scale landholders, provides jobs, and compounds the economic benefits of the stimulus. The program was designed to be labour intensive. More than 37,000 local workers are expected to be involved. Assistance is provided in the form of planting tools funded through cash payments by the Ministry of Finance directly to the local communities. Currently, there are 40,894 accounts opened by the public for this project at Bank Rakyat Indonesia (MOEF, 2021).

The program is in the early stages of implementation, so efficacy in fund distribution and community engagement in mangrove planting activities is difficult to assess. Likewise, the program's environmental benefits such as riverbank stabilisation, reducing abrasion and sedimentation, reducing intrusion in the buffer zones, carbon sequestration, protection of food sources, nursery grounds, endangered species habitat, etc. take a longer-time to materialise and therefore to assess. It seems a good green recovery initiative, but this can only be objectively assessed after several years.

Case Study: Management of Hazardous COVID19 Medical Waste

The pandemic has created a substantial waste problem from dedicated COVID19 treatment hospitals to increased use of medical equipment and personal protective equipment (PPE) (PERSI, 2020). This raises new challenges for managing hazardous and toxic medical waste (B3) originating from health service facilities. The generation of COVID19 medical waste also comes from houses with People Under Monitoring (ODP) and Patients Under Surveillance (PDP) self-quarantining. Medical waste originating from households is usually used masks, medicines, tissues, contaminated cloth, and PPE. According to the World Health Organization, medical waste mixed with household waste may have the potential for transmission. Given the limited infrastructure, funding, and existing problems with general waste management in Indonesia, the handling of household COVID19 waste should also be considered a hazard and warrant special consideration.

The management of medical B3 waste has been regulated in the Minister of Environment and Forestry Regulation no. 56/2015 (concerning Procedures and Technical Requirements for Management of Hazardous and Toxic Waste from Health Service Facilities) and Minister of Health Regulation 7/2019 (concerning Hospital Environmental Health). However, numerous aspects of waste management may not be suitable under the current conditions of the COVID19 pandemic. For example, the provisions on the use of incinerator technology as the only way to treat medical B3 waste (article 17 paragraph 3). The use of an incinerator is deemed inefficient and unsuitable under the current conditions of the COVID19 pandemic. In contrast, other technologies can possibly be used, such as microwaves, and radiofrequency irradiation. Additionally, the storage time for infectious waste (two days) is inadequate, given the lack of medical B3 waste transportation services and the lack of on-site health facilities in the region's remote areas. There is also no specific procedure for burying pathological medical waste and disinfected sharp objects.

Several recommendations were made by the project proponents to complement existing policies, including: (1) prioritizing autoclave options or non-incinerator technology for areas where hospitals do not yet have on-site treatment and no B3 waste treatment services are available; (2) coordination of inter-provincial medical waste management that is mutually beneficial to both parties under the strict supervision of the Ministry of Environment and Forestry (KLHK); (3) Re-establishing the obligation of all COVID19 referral hospitals to have and increase the capacity of B3 Waste TPS as a temporary storage place for medical waste before being processed or transported (at least 2 x 24 hours) by B3 waste transport and processing services; (4) Instructing each Regional Head to cooperate in the four sectors of integrated medical waste management, namely the Environment Service, Health Service, hospitals and other health service facilities, and the Village Government as the main executor who interacts with the community in waste management ; and (5) develop a special protocol to carry out separate management of household medical waste and other household waste at each regional TPS/TPA in accordance with the procedures established by the Ministry of Environment and Forestry and the Ministry of Health.

1.3.2 Indonesia's Performance on the Greenness of Stimulus Index

The Greenness of Stimulus Index (GSI) assesses the effectiveness of the COVID19 stimulus efforts of the world's leading G20 economies in ensuring an economic recovery that takes advantage of sustainable growth opportunities and builds resilience through the protection of the climate and biodiversity. This assessment is based on: (1) the total stimulus funds flowing into environmentally intensive sectors; (2) the existing green orientation of those sectors, such as the share of renewables in the energy sector; and (3) the green orientation of new stimulus measures (Vivid Economic, 2020).

The GSI shows that governments to date have largely failed to harness the opportunity green recovery offers. In G20 economies, the announced COVID19 stimulus to date will have a net negative environmental impact in 16 of the 20 economies. Emerging economies most dependent on environmentally intensive sectors and without strong regulatory oversight have an enormous task to turn their stimulus green and have so far failed to achieve this. For example, in response to the pandemic, Indonesia has passed USD 46 billion in fiscal stimulus. It has implemented a mix of positive and negative environmental policies, resulting in a negative index score that is primarily driven by poor underlying environmental performance. Out of the 16 G-20 countries with negative GSI scores, Indonesia's score is among the lowest (-73), along with Saudi Arabia, China, and Turkey.

Indonesia and Brazil are major agricultural commodity producers historically challenged by poorly implemented or unenforceable environmental policies causing significant forest degradation and damage biodiversity and ecosystem impacts. As a result, their agriculture sectors remain on a trajectory of high emissions intensity and essential habitat and biodiversity destruction. In the last decade, Indonesia loosened its permitting restrictions for timber producers, but since 2018 has somewhat reversed this measure, improving its GSI score. Nevertheless, Indonesia has passed a law that deregulates the mining industry and approved a stimulus that provides substantial funds to support state-owned oil and gas and electricity companies and airlines. Such policies risk undermining previous commitments to reduce greenhouse gas emissions, preserve nature and strengthen natural capital while providing minimal benefits in terms of immediate emergency economic stimulus. To manage the COVID19 crisis while protecting and rebuilding nature simultaneously, the 16 countries, including Indonesia, must include environmental actions as a fundamental component of their stimulus measures.

1.3.3 Low Carbon Development Financing Through Regular State Budget

In line with the potential emission reduction result, the state budget allocation for low carbon development actions is also reduced during 2020, compared to 2018–2019. During 2018–2019, the low carbon development financing from state budget were around 34.6 trillion Rupiah while in 2020, this value fell to 23.4 trillion Rupiah, despite the increased total sum of state budget (Bappenas, 2020b). These were the result of the realocation of those budgets to handle COVID19 and various economic recovery programs, indicating the low priority of Government of Indonesia to finance low carbon development actions as a central strategy for national economic recovery.

1.3.4 Reasons why Green Recovery is Not Currently Prioritised

Under current circumstances, green economy initiatives are not prioritised in Indonesia's post-COVID19 economic stimulus program, and more generally, in Indonesian national budgeting processes. The following points were identified through Bappenas's unsuccessful attempts to secure funding for the green recovery project proposals described in Section 3 of this Roadmap in 2021 for implementation in 2022. Government of Indonesia created two separated budgeting process during the COVID-19 Pandemic response, the existing regular budgeting process, and the new national economic recovery (PEN) processes. This new budgeting process did not include Bappenas as one of its stakeholders, making it relatively harder for Bappenas to have its consideration included while designing the national economic recovery. This is ultimately unfortunate as the long-term impact caused by our COVID-19 Pandemic response should also considered during decision making, including long-term sustainability and environmental impacts.

These circumstances therefore conclude that attempting to secure budget from the regular budgeting process is the most possible option for Bappenas. During 2021, Bappenas put its focus in advocating green recovery initiatives to the line ministries instead of the PEN committee. These reasons provide the opportunity to learn from experience and explain how the critical components of the Roadmap address the critical challenges at hand.

1. **Green economy initiatives are generally perceived as longer-term and, thus, inherently less urgent.** This seems especially so in a time of crisis, such as in the current pandemic, where the various budget decision-makers in the Ministry of Finance and other relevant departments are focusing on more immediate and direct impacts on the economy and people's welfare. This is evidenced in the way funding has been allocated in the PEN.

2. **The Indonesian government's financial resources are limited, particularly in this time of crisis.** Tax revenues have shrunk. Public debt has increased. Unemployment and poverty have risen. The impacts of the pandemic on peoples' lives are immense. There are many immediate demands on the national budget, such as for health care and vaccinations. Multiple proposals compete for the stimulus funding. Proposals that are popular, proven, and easily implemented for short-term benefits are favoured, e.g., social protection initiatives. In this budgeting context, decision-makers are less likely to allocate funds to projects perceived as less urgent or not having an immediate impact on the economy.

3. **There are weak inter- and intra-sectoral and ministerial synergies that constrain green economy initiatives' development and funding.** In many cases, each ministry or department is too singularly focused on its sectoral priorities and key performance indicators. Given the presently siloed structure of sectoral and ministerial offices, there is a lack of political motivation to pursue more comprehensive initiatives. This is evident in Indonesia's approach to greenhouse gas emissions: the targets are ambitious, but the actions are siloed, not integrated, and, therefore, most often, have limited effectiveness. Moreover, each ministry has a different perspective on a 'green' approach and how urgently the measures need to be implemented.

4. **There is limited political pressure on Indonesia's legislative body (DPR) to value green economy principles.** There is little advocacy or political priority for green development, particularly in the present state of crisis, where the political focus is on immediately reducing the impacts of COVID19.

5. **The PEN has not prioritised green recovery initiatives.** Certainly, part of this lies in elements of the four reasons listed above; green recovery initiatives are not perceived as funding priorities. Of the few projects approved that are classified by the PEN as 'green', it seems from their implementation progress to date that their inclusion was a result of political factors rather than compelling analysis, justification, and planning. Solid and relentless advocacy is required across key stakeholder groups for green economy initiatives to be more effectively included in Indonesia's national budgeting processes.

2 Actions to Prioritise Green Recovery Initiatives Post-COVID19

2.1 How the Roadmap Addresses the Challenge of Prioritising Green Recovery

The rationale for this Green Recovery Roadmap is displayed in Figure 5. The rationale for the Roadmap stems from identifying and addressing the challenges to having green recovery initiatives prioritised in the Indonesian state budgeting process. This Roadmap includes strategies to address those challenges, actions to enact those strategies between 2021 and 2024, and milestones to track progress (Table 3). Those strategies and actions contribute to the realisation of the two key outcomes of the Roadmap by the end of 2024.

The reasons why green recovery principles are currently not prioritised in the Indonesian state budgeting process, as outlined in 1.3.3, form the base of the roadmap. Those reasons are, in effect, the challenges (Table 2) that the Roadmap needs to overcome to achieve its objective of mainstreaming green economy principles in Indonesia's sustainable development agenda. A transformation is required in the way decision-makers and those charged with allocating state budgets perceive green recovery initiatives. Green recovery initiatives must be prioritised in state budgeting processes for the green economy to be realised.

The five challenges listed in Table 2 are the insights we gained in 2021 during our attempt to develop, socialise and have funding allocated to the specific green recovery initiatives for the waste, energy, and plantation sectors that are outlined in Section 3 of the Roadmap. To address these challenges, the Roadmap specifies five strategies (listed in Table 2). The first of these strategies is to engage stakeholders to radically transform the way green recovery initiatives are perceived by government bureaucrats such that green economy initiatives are preferred over conventional alternatives. The second strategy is to drive the revision of the medium-term development plans of relevant line ministries to better integrate green economy principles within and between organizational units. The third strategy is to establish and use pilot projects to demonstrate the benefits of green economy initiatives and build stakeholder support. The first pilot projects are the proposed green recovery initiatives outlined in detail in Section 3 of this report. The fourth strategy is to identify preferred longer-term initiative-specific funding pathways, preferably through existing mechanisms. Finally, the fifth strategy is to develop and apply a method to evaluate how effectively the Roadmap outcomes have been achieved.

The five strategies listed in Table 2 are aligned with twelve actions and corresponding milestones and outcomes listed in the Roadmap Action Plan shown in Section 2.2.1 in Table 3 (2021 to 2024 four-phase Action Plan of the Roadmap entitled Respond, Recover, Re-evaluate, Rewards).

Figure 5. Rationale for the Green Recovery Roadmap

Table 2. Rationale for Roadmap – Addressing Constraints to Green Recovery Funding

Challenges Lessons Learnt from 2021	Strategies Correspond to 2022 to 2024 Actions	Outcomes
C1 The perception held by most Indonesian government bureaucrats responsible for budgeting is that green economy principles are not a priority for Indonesia in the short term. **C2** The PEN has not prioritized green recovery initiatives. **C3** Indonesia's legislative body does not advocate for green economy principles. **C4** Weak inter and intra sectoral and ministerial synergies constrain green economy initiatives' development and funding.	**S1** Engage stakeholders to radically transform the way green recovery initiatives are perceived by government bureaucrats such that green economy initiatives are preferred over conventional alternatives. **S2** Revise the medium-term development plans of relevant line ministries to integrate green economy principles within and between organizational units. **S3** Use pilot projects to practically demonstrate the benefits of green economy initiatives and build stakeholder support.	**O1** Green recovery program is acknowledged as a priority through the PEN or the regular development planning and budgeting processes.
C5 The complexity and scale of the national budgeting challenge in Indonesia.	**S4** Identify preferred longer-term initiative-specific funding pathways, preferably through existing mechanisms. **S5** Develop and apply a method to evaluate how effectively the outcomes of the Roadmap have been achieved.	**O2** Sufficient funds are secured to sustain longer-term green economy initiatives.

The Actions of the Roadmap are discussed further in the next Section 2.2. In terms of the rationale for the Roadmap, the Actions are how the Strategies to address the Challenges are enacted. There are 12 discrete Actions in the Roadmap, three of which have been completed in 2021. These Actions can be supported by funding by donor agencies willing to support Indonesia's pursuit of green economy development. The Actions are supported by Milestones (Table 3) which can be used to monitor progress.

In the Roadmap rationale displayed in Figure 5, the Actions are shown to have three sub-components. First, the Actions are laid out in an Action Plan, referred to as the Respond, Recover, Re-evaluate, Reward Action Plan (Table 3). Second, a vital part of the Actions lies in the Stakeholder Engagement Plan outlined in Section 2.4 of the Roadmap. The purpose of the Stakeholder Engagement Plan is to set out some initiatives (such as the Green Marketing Network initiative) and pillars (guidelines) of stakeholder engagement that help support efforts to transform the way key stakeholders currently perceive and prioritise green recovery initiatives. Third, a number of the Roadmap's Actions (1.1, 2.1, 3.1 and 4.1) relate to pilot activities for the sector-specific green recovery initiatives detailed in Section 3 of the Roadmap. The details of these sector-specific green recovery proposals are described in detail in Section 3.

The Actions of the Roadmap are designed to achieve the two Outcomes listed in Tables 2 and 3 and discussed in Section 2.2.2. Through these two Outcomes, the Roadmap achieves its objective of mainstreaming green recovery principles in the Indonesian state budgeting process.

2.2 Respond, Recover, Re-evaluate, Reward

2.2.1 Actions and Milestones

The Roadmap will be implemented between 2021 and 2024 over four core phases of action: (1) respond; (2) recover; (3) re-evaluate; and (4) reward. These phases represent the stages of recovery from the COVID19 pandemic. Each phase includes a set of Actions and Milestones as shown in Table 3. There are 12 Actions in the Action Plan shown in Table 3. Three of these have been completed in 2021 (the respond phase), namely: Action 1.1, which identified and evaluated a short-list of green recovery projects in the focus sectors of waste, energy, and plantations; Action 1.2 reviewed funding and budgeting systems, including the PEN; and Action 1.3 involved more than 20 formal meetings with key stakeholders to garner support for the proposed green recovery initiatives. The Actions culminated in the development of this Roadmap (Milestone 1).

There are four Actions listed in the 'recover' phase (2022) of the Roadmap. The first (Action 2.1) aligns with Strategies 3 and 4 (Table 2) and involves further technical preparation of the pilot projects on waste, energy, and plantations (proposals detailed in Section 3 of the Roadmap). The second action (Action 2.2) advances the stakeholder engagement plan, including commencing the change-driver program and green marketing network initiative. Action 2.2 aligns with Strategy 1 (Table 2). The third action (Action 2.3) involves continued efforts to secure funding for the sector-specific proposals and pilot projects outlined in Section 2, either through the PEN or the line ministry budgets (aligned with Strategy 4). The fourth action extends the stakeholder engagement plan for a specific purpose; to engage line ministries and facilitate review of medium-term development plans to better integrate green economy principles within and between organizational units (aligned with Strategy 2). By the end of 2022 and the recovery phase of the Action Plan, funding should be secured to enable the implementation of the pilot projects in 2023 (Milestone 2.1). Reviews of medium-term development plans of relevant line ministries should be initiated (Milestone 2.2), and the change drivers should be appointed, and the green marketing network established (Milestone 2.3).

In 2023, in the 're-evaluate' phase of the Action Plan, there are three Actions. First, the work on the pilot projects is continued through Action 3.1 (continuing with Strategies 3 and 4 as listed in Table 2). The corresponding milestone (Milestone 3.1) is to launch some pilot projects by the end of 2023. The second action (Action 3.2) is to review the roadmap and develop a method to evaluate how effectively the Roadmap outcomes have been achieved (by the end of 2024). This aligns with Strategy 5 listed in Table 2. As a result, by the end of 2023, a revised or amended Roadmap should be published, and the method to evaluate outcomes should be established and ready to use (Milestone 3.2). The third action for 2023 (Action 3.3) is to continue to work on the revisions of medium-term development plans (aligned with Strategies 1 and 2). By the end of 2023, some of the medium-term development plans of relevant line ministries should be revised to integrate green economy principles (Milestone 3.3).

In the final year of the Roadmap (2024), the phase where the 'rewards' of earlier phases should be realised, work will continue launching and expanding pilot projects (Action 4.1, aligned with Strategies 3 and 4). Likewise, the stakeholder engagement plan will continue, including the change-driver program and green marketing network to advocate and increase support for green economy initiatives (Action 4.2, aligned with Strategy 1). There are no Milestones in 2024 per se. The results should be evident in the Roadmap Outcomes.

2.2.2 Outcomes

The Roadmap delivers two key Outcomes (Tables 2 and 3). The first Outcome is to see green recovery initiatives acknowledged as priorities in either the PEN or the regular development planning and budgeting processes. The second outcome is that there are sufficient funding pathways secured to sustain longer-term green economy development.

In this sense, the Roadmap makes a substantial contribution to Indonesia's Sustainable Development Goals (SDGs) (as per the SDG road map for 2019–2030; SDG national action plan, 2020–2024; and SDG regional action plans, 2020–2024), national climate targets, including medium-term Nationally Determined Contributions and longer-term Net Zero aspirations, green economy indicators and national biodiversity conservation targets. These include: (1) all four pillars of Vision 2045 (the pillars are listed in later parts of the Roadmap); (2) the RPJMN 2020–2024 (3) sector-specific development agendas such as the national electricity supply plan (RUPTL), set by the government for state utility company PT Perusahaan Listrik Negara (PLN) for a ten year period (which currently aims to increase the proportion of renewable power in its 2021–2030 national electricity plan to at least 48%, from 30% in the 2019–2028 plan) and the Strategic Plan of the Ministry of Agriculture (RENSTRA) 2020–2024, which advocates for more sustainable and productive agricultural industries.

Table 3. The Roadmap's Four Phases of Implementation (Action Plan)

Phase	Year	Action	Milestone
Respond: take stock and plan response	2021	**Action 1.1** Identify and evaluate the short-list of green recovery pro-jects in focus sectors of waste, energy, and plantations. **Action 1.2** Review funding and budgeting systems, including PEN. **Action 1.3** Build stakeholder support for green recovery initiatives.	**Milestone 1** Develop Green Recovery Roadmap.
Recover: Pilot projects progress and funding secured. Planning processes of line ministries aligned with green recovery principles	2022	**Action 2.1** Complete technical preparation of the pilot projects on waste, energy, and plantations (Strategies 3 and 4, see Section 3). **Action 2.2** Develop and implement strengthening plan of key stakeholder organizations and individuals for pilot project implementation, including change-driver program and green marketing network (Strategy 1). **Action 2.3** Continue efforts to secure funding for pilot project implementation through PEN and line ministry budgets (Strategy 4). **Action 2.4** Engage line ministries and facilitate review of medium-term development plans to integrate green economy principles within and between organizational units (Strategy 2).	**Milestone 2.1** Secured funding for 2023 implementation of pilot initiatives. **Milestone 2.2** Initiated reviews of medium-term development plans of relevant line ministries to better integrate green economy principles within and between organizational units. **Milestone 2.3** Appointed change drivers and established green marketing network.
Recover and Re-evaluate: controlled duplication of pilot projects and review of Roadmap (post-2024)	2023	**Action 3.1** Continue work on pilot projects and specific green recovery initiatives identified in the Roadmap for the waste, energy, and plantations sectors (Strategies 3 and 4, see Section 3). **Action 3.2** Review Roadmap (post-2024), including consideration of new initiatives. This includes developing a method to evaluate how effectively the outcomes of the Roadmap have been achieved (Strategy 5). **Action 3.3** Continue stakeholder engagement and work with line ministries to revise medium-term development plans to integrate green economy principles within and between organizational units (Strategies 1 and 2).	**Milestone 3.1** Launched pilot projects for waste, energy, and plantations sectors. **Milestone 3.2** Revised Roadmap (post-2024), including consideration of new initiatives that could be included in the future. **Milestone 3.3** Developed a method to evaluate how effectively the outcomes of the Roadmap has been achieved. **Milestone 3.4** Revised medium-term development plans of relevant line ministries to better integrate green economy principles within and between organizational units.
Reward: outcomes delivered, green recovery prioritized in budgeting processes	2024	**Action 4.1** Continue work on pilot projects and specific green recovery initiatives identified in the Roadmap for the waste, energy, and plantations sectors (Strategies 3 and 4). **Action 4.2** Continue with stakeholder engagement plan, change-driver program, and green marketing network to advocate and increase support for green economy initiatives (Strategy 1).	**Outcome 1** Green recovery program is acknowledged as a priority through the PEN or the regular development planning and budgeting processes. **Outcome 2** Sufficient funding pathways are secured to sustain longer-term green economy development.

2.3 Linking with National Visions and Development Plans

In the medium and longer-term, advocacy of green recovery initiatives can be strengthened by demonstrating how their benefits contribute to, align with, and compliment the objectives of several important national sustainable development agendas.

Indonesia's Vision 2045 includes four pillars: (1) human development and the mastery of science and technology; (2) sustainable economic development; (3) equitable development; and (4) strengthening national resilience and governance. All these principles align with green economy principles. To achieve green economy in line with that vision, Government Regulation (PP) 46/2016 on Strategic Environmental Assessment already mandates low carbon development principles in the assessment of policies, plans, and programs concerning environmental conditions. This was elaborated further through Presidential Regulation 18/2020 about Indonesia's National Mid-Term Development Plan (RPJMN) 2020–2024. This current development plan has incorporated "Strengthening the Environment and Improving Resilience Against Natural Disasters and Climate Change" as one of its national priorities, which includes Low Carbon and Climate Resilience Development. All these initiatives are in line with the achievement of green economy in the future.

There are also numerous sector-specific development agendas that the Roadmap should pay close attention to, considering alignment criteria. An example is the national electricity supply plan (RUPTL). The government sets this plan for state utility company PT Perusahaan Listrik Negara (PLN) to guide electricity sourcing over 10 years. The RUPTL aims to increase the proportion of renewable power in the 2021–2030 national electricity mix to at least 48%, from 30% in the 2019–2028 plan. Another example is President Regulation 97/2017 (Jakstranas) which sets a roadmap to reduce Indonesia's waste by 30% and reduce waste to landfill by 70% by 2025. Similarly, the Strategic Plan of the Ministry of Agriculture (RENSTRA) 2020–2024 advocates for more sustainable and productive agricultural industries. This aligns closely with the green recovery initiatives for the plantation sector that are included in this Roadmap. So do other more specific complementary initiatives such as the Sustainable Landscape Restoration initiative for the Musi, Batanghari and Kapuas watersheds.

2.4 Building Supportive Regulatory and Governance Policies and Practices

Apart from funding, green recovery initiatives should also be supported by conducive regulatory and governance policies and practices. Much has been written about the need for governance reform in Indonesia, and a detailed discussion of those issues is beyond the scope of this Roadmap. However, these issues need to be considered as green economy initiatives are designed and planned. According to Barbier (2010), strategic considerations need to be integrated into the design of green economy initiatives to address or at least navigate shortcomings in related policies and governance systems. An excellent example of this challenge is waste governance in Indonesia. Improving waste governance is essential to initiatives that aim to improve waste management practices. Previous studies have shown that the main problems of waste management in Indonesia stem from the lack of law enforcement efforts, the misallocation of waste management costs, the decline of standards, and the diffusion of responsibility. The waste sector green recovery initiative proposed in the later parts of this Roadmap focuses on incentives and capacity building that address at least some of these problems. Green recovery initiatives can improve conditions and grow MSME waste processing capacity. This encourages entrepreneurship and improvements in practice standards and industry expectations.

To support the national economic recovery efforts while promoting climate change mitigation, incentives for the SMEs investing

in Green Recovery Projects should also be established. Some of the existing policies can be seen as an opportunity to mobilise stakeholders' support for green recovery initiatives. For example, the current government regulation (Peraturan Pemerintah (PP) Perubahan atas PP No. 23/2020) on the implementation of the National Economic Recovery (PEN) Program to support government financial policies to tackle the impacts of the COVID19 pandemic. The regulation imposes provisions for SMEs to get the incentive or soft loan under the PEN program. Concerning this regulation, the Ministry of Finance, BAPPENAS, and the Ministry of Cooperatives and SMEs could collaborate and issue a preferential treatment for cooperatives and SMEs involved in green recovery projects. This may include additional requirements and/or additional incentives for SMEs engaged in green projects. This should encourage SMEs and businesses to lean towards supporting green projects.

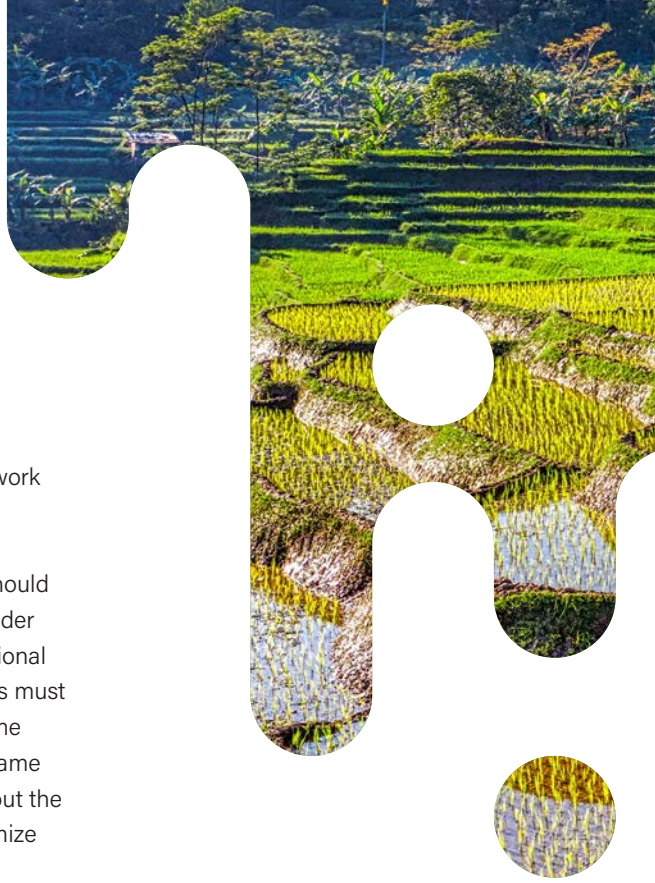
Another example is the Government Regulation (PP) No. 5 of 2021 on implementing Risk-Based Business Licenses. This regulation imposes provisions to obtain business licenses and the consequences of violating the regulation. Rewards to businesses involved in the green recovery projects are a necessary part of the provision expansion. Relevant ministries should collaborate to accommodate such rewards in the government regulation. This can become part of the government efforts to mitigate climate change, which may exacerbate the impacts of the COVID19 pandemic and health crisis in Indonesia.

2.5 Stakeholder Engagement Plan

Initial stakeholder feedback on the proposals (from other BAPPENAS Directorates, line Ministries and the Ministry of Finance) was very positive and very supportive. The BAPPENAS Environment Directorate went into budget discussions with good reason to think the proposals would be funded. But as the focussed discussions on budget allocations took place, both under the PEN and under the regular budgeting processes of the line ministries, it became apparent that green recovery initiatives were not a budgeting priority. It may have even been the case that by describing the projects as green recovery, this may have disadvantaged them by way of misperception.

The proposals were socialised through more than 20 formal stakeholder meetings. However, despite these compelling features and extensive stakeholder efforts at stakeholder consultation, all the proposals listed in Sections 3 of the Roadmap have failed to secure 2022 funding, either from the PEN or regular ministerial budgets. The possible exception to this is the waste sector which may have confirmed (in 2021) support for pilot initiatives in 2022 but not as a green recovery initiative per se, but rather as part of the PEN allocation to MSMEs.

An essential part of the Roadmap is prioritising green recovery principles in the national budgeting process, both in the short-term PEN and the longer-term regular line ministry budgets. The Roadmap works to achieve this by engaging stakeholders to radically transform the way green recovery initiatives are perceived such that green economy initiatives are preferred over conventional alternatives. The three key elements of the Roadmap's stakeholder engagement strategy are the change driver initiative, the green marketing network, and a set of stakeholder engagement principles



2.5.1 Change Drivers and Green Marketing Network

To affect change significantly changes in perspective relating to green recovery initiatives, improving, and strengthening the capacity of stakeholders is necessary. Officials that will be issuing new policies will need to have a more in-depth understanding of the issues and alternative responses. The private sector will need to understand the need to adhere to the new policies and regulations. Workers need to apply the new methods to enable successful implementation correctly. To ensure that more efficient and continual positive change is made, green economy initiatives should identify officials to be appointed as change drivers (Action 2.2). These officials will be equipped with more in-depth knowledge of the green economy principles. As change drivers, these officials will provide the necessary guidance for their colleagues and advocacy to the higher-level officials within their Ministries. In short, they will be the driving force towards positive change.

Green recovery initiatives require commitment and continuous support from government officials at multiple levels. Therefore, officials in charge of the initiatives (at whatever level that are appointed) need to be the change drivers, as they will be responsible for driving the necessary changes required for implementation. The role of the change drivers is to provide technical advice and policy advocacy and to monitor the progress of activities and performance indicators. Specifically, the change drivers will advise local government procedures and regulations that may hinder or benefit the project's activities, work plans, and indicators.

The change-drivers program should be integrated with the Stakeholder Engagement activities. The regional and local government ministries must appoint specific officials by name and by position to ensure the same persons are in charge throughout the GRP. This is necessary to minimize missed coordination or missing links as the project proceeds further. Otherwise, various meetings would be attended by different officials that might not understand or have only a partial understanding of the projects and thus may cause unnecessary delay on the progress of projects.

In the first phase of the Roadmap (2021), the change drivers will be identified and appointed at the national, provincial, and district levels to assist the implementation of GRP (i.e., echelon 2 (two) at national and provincial levels; echelon 3 (three) at district level). Phase 2 Milestone 2: Capacity-building for change-drivers (in-depth understanding of green perspective and GRP) and policy-assessment skills. Phase 3 Milestone 1: Reports on procedures and regulations that may hinder or benefit the progress of project's activities, work plans and indicators (recommendation on possible solution). Phase 4 Milestone 2: Monitoring and Evaluation Reports on the progress of project's activities, work plans and indicators, with recommendations on how to best integrate the mechanism into appropriate regulatory frameworks for the larger-scale pilot project.

The green marketing network (a network of advocates working to promote the benefits of green recovery, see Action 2.2) should be developed at two different levels. The first is to spread awareness of green-recovery projects to other ministries and other regional/local governments outside the scope of the pilot projects. Building a green marketing network will enable a smoother transition towards the post-2024 of the Roadmap when the pilot projects will be expanded. The second level of the green marketing network should focus on the consumer side of the green economy initiative supply chain. Strategic marketing is essential to ensure the maximum benefit of green value is commercially realised. The products of green economy initiatives need to be recognised as a higher value. A green marketing network should be used to promote and inform the marketplace about the benefits of green economy initiatives.

One of the issues relating to the first level of marketing is that the workings within the government (national, regional, and local) tend to be categorized. GRP should not be isolated from other aspects of development. GRP influences and is impacted by various development policies. For example, waste, energy, and plantation are closely related to the industry sector. Thus, industry policies may affect GRP. Therefore, it would be prudent to build an awareness network with the Ministry of Industry and relevant units at local government.

The second level is an anticipatory step for marketing the GRP products. Often, product exhibitions conducted by governments (at national and local levels) is rather habitual, inviting the same parties every year. This will not significantly boost the sales and marketing of the products. Marketing of the GRP products should be in a more strategic way, which would require new marketing networks, inviting new businesses, etc.

2.5.2 Pillars of Stakeholder Engagement

The Roadmap is built on four pillars of stakeholder engagement (Table 4). These pillars guide the plan for building the stakeholder support to prioritise green recovery principles in the Indonesian economic recovery national budgeting process. The pillars are stakeholder engagement activities that will occur concurrently between 2021 and 2024 in a manner aligned with the Roadmap actions and milestones and as opportunities arise in relevant budgeting processes. In Table 4 four different groups of stakeholders are identified; (1) BAPPENAS, led by the Environment Directorate; (2) the line Ministries, including the Ministry of Cooperatives and Small and Medium Enterprises, the Ministry of Energy and the Ministry of Agriculture and Ministry of Environment and Forestry; (3) the Ministry of Finance; and (4) other key stakeholders such as the Local and Provincial Governments where pilot projects may be planned and the private sector (for example, those companies involved in the implementation of green recovery initiatives in the waste and energy sectors). These stakeholder groups have different roles. For example, the Environment Directorate of BAPPENAS has taken charge of the Roadmap and will be responsible for engaging other Directorates and line Ministries in the relevant consultations.

The first pillar involves engaging stakeholders in the conceptualisation and development of green recovery options. The second pillar involves engaging stakeholders in pilot and demonstration initiatives that show the benefits of green recovery principles in action. The third pillar involves engaging stakeholders to allocate and prioritise financial support for green recovery initiatives. The fourth pillar involves engaging line ministries to review their medium-term plans to integrate environmental and climate-related issues effectively. This also involves engaging stakeholders to build capacity to engage in green recovery initiatives effectively and develop new green recovery project ideas. To enable the ministries to carry out each pillar, stakeholders in line ministries need to strengthen their advocacy, planning, and budgeting capacities. Such capacity building would allow better results for Pillar 1, 3, and 4. In addition, the establishment of forums (at local levels) would enable less formal coordination meetings for problem-solving at more technical levels of GRP (Pillar 2).

Table 4. Pillars of Stakeholder Engagement

BAPPENAS (Led by the Environment Directorate, supported by other Directorates)	**Line Ministries** (Ministry of Cooperatives and Small and Medium Enterprises, Minister of Energy, Ministry of Agriculture and Ministry of Environment and Forestry)	**Ministry of Finance**	**Key Stakeholders** (Provinces, Local Governments, Private Sector, International Donors)
Pillar 1 Conceptualizing and Development of Green Recovery Options			
Drive the development of green recovery initiatives including consultation between different Directorates in BAPPENAS and other line Ministries by building consensus and presenting strong evidence-based analysis of costs and benefits.	Discuss green recovery options and consider budget allocation pathways to support longer term implementation.	Provide advice on funding options and mechanisms for green recovery options.	Start to create a broader network in support of green recovery and green economy in Indonesia. Include the private sector, particularly in the waste and energy sectors.
Pillar 2 Piloting and Demonstration Initiatives, Implementation – Proving the Benefits			
Coordinate the implementation of the initiatives by assisting line Ministries to pilot and operationalize.	Implement the initiatives, either directly or first through pilot initiatives.	Facilitate the allocation of funding to support the green recovery pilot initiatives in the relevant budgeting processes.	Engage in the implementation of green recovery initiatives as participants, service providers and beneficiaries.
Pillar 3 Unlocking Financial Support and Prioritization in National Budgeting Processes			
Identify specific pathways for funding. Facilitate the development and implementation of mechanisms to operationalize green economy initiatives.	Facilitate the prioritization and allocation of funding to support green recovery initiatives in the relevant budgeting processes.	Facilitate the prioritization and allocation of funding to support green recovery initiatives in the relevant budgeting processes.	Consider co-financing or at least supportive actions to facilitate budget allocations.
Pillar 4 Supporting Ministries to Review Medium-term Plans to Integrate Green Economy Initiatives			
Engage line Ministries and discuss opportunities to support a review of relevant medium-term development plans to better integrate green economy initiatives.	Identify ways that rele-vant Ministry-level medium-term development plans can be revised to better integrate green economy initiatives.	Support and facilitate the better integration of green economy initia-tives in the medium-term development plans of relevant line Ministries.	Engage in the implementation of the medium-term development plans of relevant line Ministries.

3 Proposed Green Recovery Initiatives

3.1 Overview

The following section describes three proposals for green recovery initiatives, each for the waste, energy, and plantation sectors. The proposals summarise the rationale for the initiatives, an overview of what the initiatives involve, their costs, their benefits for economic growth, jobs and the environment, and the plan for their implementation. These initiatives are the product of detailed analysis and extensive consultation with key stakeholders, particularly the relevant line ministries. One of the key lessons of our 2021 experience in developing these sector-specific proposals is that to advocate and promote green recovery initiatives and to link with key stakeholders (such as those who allocate budgets) in a meaningful way so that the proposals have strong support, is that green recovery proposals must be specific, compelling, and realistic. Plans with sufficient detail are also required for the pilot project Actions are listed in Table 3. Therefore, the following specific proposals for the waste, energy and plantation sectors have been included in this Roadmap. Each of the following proposals is in the process of implementation. The three proposals are summarised in Table 5. Importantly, these are just three specific proposals from our work in 2021. The Roadmap review scheduled in the Action Plan for 2023 enables new ideas and initiatives to be added into the green recovery agenda (e.g., green buildings or biodiversity-related projects).

Table 5. Summary of Sector Specific Green Recovery Initiatives Proposed in the Roadmap

Description	Economics Benefits	Environmental Benefits	Cost	Funding Mechanism
Stimulus for 7,500 waste sector micro, small and medium enterprises through the soft loans and safeguard programs to develop waste management performance improvements.	Expected to increase waste recycling by up to 60,000 tons/day and potentially generate economic benefits of up to 34.5 trillion, including 112,500 new job opportunities, between 2022 and 2024.	By increasing waste recycling by up to 60,000 tons/day, the initiative should avoid 158 million tCO_2e over 20 years.	The proposal will be implemented between 2022 and 2024 with a total cost of Rp 3.57 trillion.	We propose the costs be financed through the PEN, through the Government Work Plan (RKP) 2022. A stimulus budget of Rp 3.57 trillion will be allocated to the Ministry of Cooperatives and Small and Medium Enterprises under that mechanism.
Installing rooftop solar panels on 70 government buildings up to 14MW installed capacity in total (with the option to extend to more government buildings).	Estimated to save Rp 411.4 billion/year in electricity costs per year for 25 years. Estimated to involve at least 700 jobs in the construction phase for installation, logistics, and maintenance.	Estimated to avoid at least 339,624 tCO_2e in total over 25 years.	Rp 210 billion from 2022 to 2024.	We propose the costs are appended to the regular budget of the Ministry of Energy and Mineral Resources.
The Plantation Rejuvenation Program aims to increase the productivity of plantation crops, increase the income level of farmers through the provision of direct cash assistance at a time when crops have not yet produced, and reduce the negative impacts of deforestation driven by smallholder farmers trying to improve their agricultural yields.	Estimated to support approximately 172,000 jobs. Estimated to increase plantation production by up to 15%, equivalent to Rp 25 trillion/year once plantations are of productive age (five to 25 years after planting). Estimated to also benefit related manufacturing industries, by up to Rp 10 trillion/year once the plantations are of productive age.	Estimated carbon sequestration of 76 million tC (more than 277 million tCO_2e) over the life of the plantations, plus deforestation substantial avoided emissions through avoided deforestation and degradation.	Rp 6.7 trillion in the period 2022–2024.	We propose the costs be allocated out of the PEN, like the Mangrove Cluster Plantings project funded through the PEN in 2021. Note that the Plantation Rejuvenation Program targets land rejuvenation of 107,208 hectares, up to 151,933 farmers, and 46 farmer corporations.

3.2 Waste Sector

3.2.1 Description

Waste MSMEs have a strategic role in supporting the recycling chain with a capacity range of around 0.5–5.0 tonnes per day per MSME. The national vision is to increase waste recycling at the source so that 30% of the total national waste composition is recycled material; currently, recycled waste composes less than 10% of the national waste mix (KLHK, 2019). In addition, waste MSMEs have a strategic role in creating job opportunities, with an employment capacity of 3–15 people per MSME.

As the capacity of waste MSMEs increases, so does their processing capacity and their employment opportunities.

Green stimulus is vital in the waste sector: it has been distributed to waste MSMEs, facilitating their improved growth, especially after the COVID19 pandemic. During the pandemic, MSMEs engaged in waste recycling services were impacted by the declining turnover of recycled products. Hence, the green stimulus will counteract this decline and help to improve and grow solid waste MSMEs. In addition, this will facilitate improved entrepreneurship in the waste sector by providing stimulus in the financing, business equipment assistance, and business assistance.

Table 6 describes the low-carbon economic stimulus program initiatives in the waste sector considering the recovery plans and post-COVID19 funding schemes in Indonesia.

Table 6. Waste Sector Green Recovery Initiative

Green Recovery Initiative Description	Stimulus for 7,500 waste micro, small and medium enterprises ("MSMEs") are proposed through the soft loans and safeguard programs in order to develop the business scale and waste management performance improvement in Indonesia.
Cost	This program is proposed for multiple years (2022–2024) with a Total Rp 3.57 trillion ▪ The program includes Rp 3 trillion for soft loans to 1,000 formal middle-scale enterprises ranging from Rp 100 million to Rp 200 billion; ▪ This program includes Rp 150 billion for soft loans to 1,500 formal micro and small scale enterprises ranging from Rp 10 million to Rp 500 million; ▪ This program includes Rp 250 billion for soft loans to 5,000 informal enterprises ranging from Rp 10 million to 100 million; ▪ This soft loan program will also include a safeguards program of Rp 170 billion to ensure the program can effectively achieve the program targets and requirements. The safeguard component consists of project management consultant personnel and facilitators, project monitoring and evaluation, and capacity building of the MSMEs and Corporations. The program will also include workshops and training, loan use and report assistance, business development assistance, institutional capacity building, and market access improvement.
Economic Benefits	▪ This program is expected to **increase waste recycling by 6,000 to 60,000 tons/day** and potentially generate economic benefits of Rp 3.45 trillion to Rp 34.5 trillion. ▪ This stimulus program also provides indirect benefits to large companies regarding waste recycling supply chains, which rely on the supply of raw materials from MSMEs. ▪ This stimulus can also affect the efficiency of government waste handling costs (transportation and final processing at the landfill).
Job Creation	▪ This stimulus program is expected to support the creation of 22,500 to 112,500 new job opportunities. ▪ Indirectly, this stimulus program could help improve the welfare of scavengers.

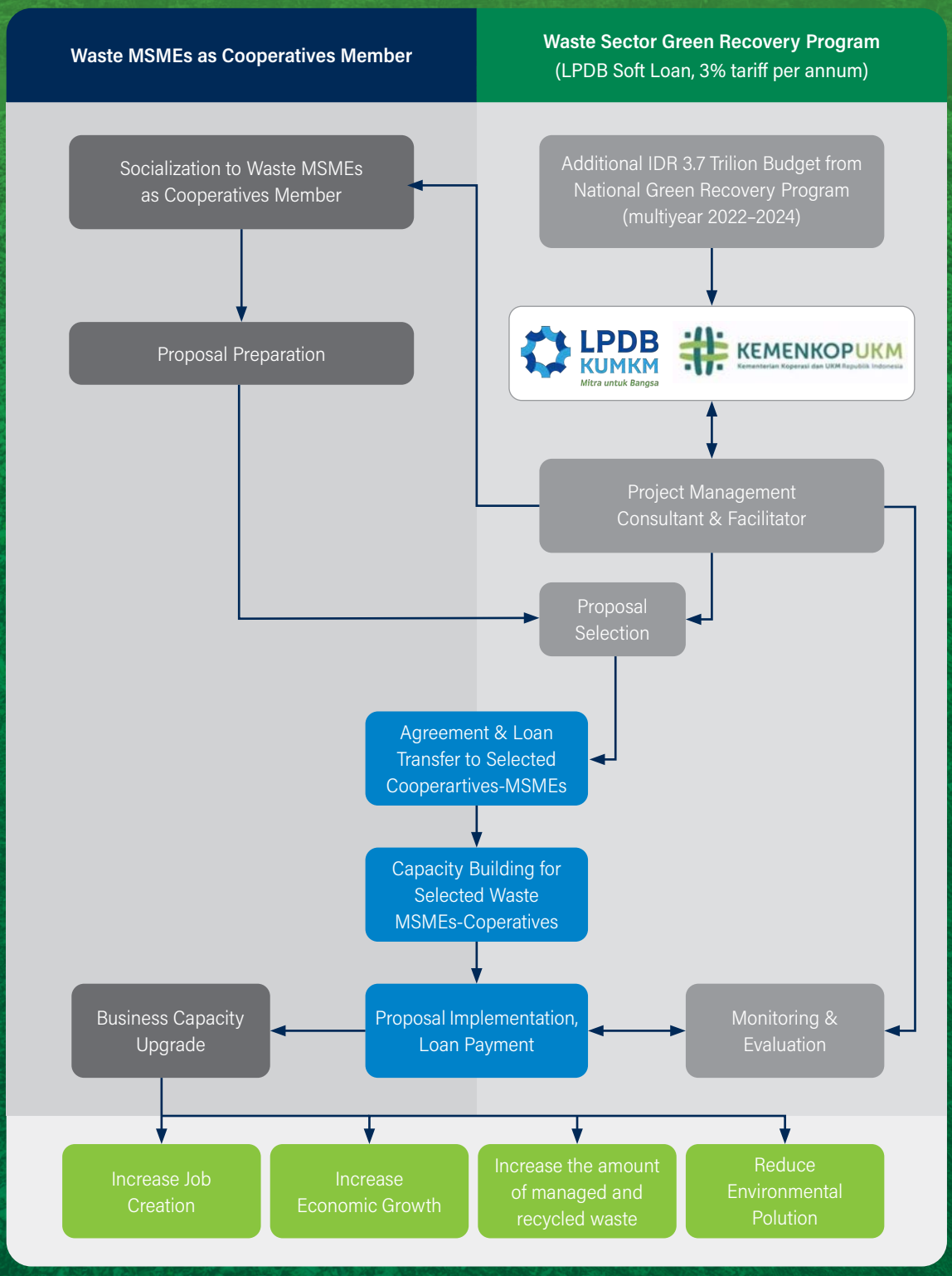
Environmental Benefits	The stimulus program is expected to increase waste recycling by up to 60,000 tons/day. This value is equivalent to a reduction in emissions of 9,589,343 tona CO_2e/year or 158 million tons of CO_2e over 20 years.
Implementation Mechanism	▪ We recommend that this stimulus program be financed through the stimulus budget of Rp 3.57 trillion allocated to the Ministry of Cooperatives and Small and Medium Enterprises ("MCSME") of the Republic of Indonesia; ▪ The process of socialization, selection of proposals, technical assistance in the use of grant funds, and capacity building will be coordinated by the Ministry of Cooperatives and MSMEs in collaboration with the Local Government, KLHK, PUPR, the Ministry of Industry and other stakeholders; ▪ The soft loan mechanism recommended will use the Revolving Fund Management Institution ("LPDB") that sits under MCSME. The MCSME policy requires the LPDB to channel loans for cooperatives, so that all of the MSMEs that want to participate in the LDPB soft loan program should become a member of a cooperative; ▪ In order to support MSMEs and Cooperatives facing impacts of COVID19, the LPDB has managed the soft loan program with an annual tariff of 3% since.
Pilot Projects and Locations	▪ 2021: East Java and Bali Province ▪ 2022: Java Island and Bali Province ▪ 2023–2024: National Level

3.2.2 Implementation Plan

The green stimulus program for MSMEs in solid waste is expected to target solid waste businesses, both formal and informal, which are members of a cooperative. Therefore, the Ministry of Cooperatives and Small and Medium Enterprises ("MCSME") of the Republic of Indonesia is most appropriate for implementing a green stimulus for MSMEs. After going through a process of discussion and evaluation of various potential resources, a green stimulus program is recommended in the form of soft loans (funds) through a revolving fund management institution (LPDB) which is a "Non-Echelon Organizational Unit" directly under the Ministry of Kemenkopumkm in accordance with Cooperatives and MSME Regulation No. 4 of 2020. The revolving credit program is proposed to encourage MSME product business development activities with details of MSME output (RO), which facilitates the improvement of production facilities and infrastructure and assists in improving institutions and networks of MSME waste products.

In 2021, the waste MSMEs stimulus program was designed by analysing data provided by key relevant parties, which include the Ministry of Cooperatives and Small and Medium Enterprises (MCSME), Ministry of Public Work and Housing (MoPWH), Ministry of Environment and Forestry (MoEF), Ministry of Investment (MoI), and Waste Associations. Therefore, potentially, around 7,500 Waste MSMEs in Indonesia may access the green recovery program. The estimate of 7,500 MSMEs is based on the current ~4,600 Active Waste Banks (MoEF 2021), ~600 Recycling Communities ("TPS 3R") (MoPWH, 2021), ~800 registered waste management companies (MoI, 2021), and an estimated ~1,500 from the informal sector. Based on these data, a green recovery program for the waste sector is proposed, as shown in Figure 6.

Figure 6. Program Implementation Scheme



3.2.2.1 Soft Loan Requirements from LPDB

Based on the MCSME regulation No. 4/2020 and information from LPDB website, key selection criteria for the LPDB program are described in Table 7.

Table 7. LPDB Requirement

Category	Detail Requirement
Beneficiary	Cooperative
Period	▪ Working Capital Loan, maximum 5 years (including grace period) ▪ Investment Capital Loan, maximum 10 years (including grace period)
Requirement	▪ The cooperative has 1 year of operation and 1 annual member meeting ▪ Have an Account and TIN ▪ Have a Cooperative Identification Number (NIK) ▪ Material guarantees (movable objects, immovable objects, pledge deposits, securities, etc.), immaterial guarantees (individual guarantees, corporate guarantees), Additional other guarantees
Loan Amount	Maximum Rp 200 billion
Tariff	Sliding per annum, National Economic Recovery (PEN) during a Pandemic with a tariff of 3%, Savings and Loans Sector with a tariff of 7%, Real Sector with a tariff of 5%
Mechanism	▪ Submission of application (proposal) ▪ Feasibility assessment (can use the services of an independent consultant, coordination with regional apparatus) ▪ After being assessed as worthy, a stipulation and agreement will be made ▪ Disbursement can be done through banking, sharia, conventional, venture patterns ▪ Grace Period (grace period without fines) specifically for the pandemic period 6 months – 1 year, or 3 months after the impacts of the pandemic have subsided

Additional requirements specific to waste MSMEs are also needed, which are listed in Table 8.

Table 8. Proposed Additional Requirement

Assessment Components	Description
Business Facilities	▪ Running a business for at least 3 years in the field of waste management ▪ Have a clear office status ▪ Have a work contract or certificate from the buyer/off-taker ▪ Have a business development plan that aims to increase waste processing capacity
Legal and Institutions	▪ Have business legality ▪ Become a member of the cooperative
Financial	▪ Have no previous arrears on other loans ▪ Have financial reports ▪ Have active bank account for the last 2 years
Waste MSMEs category	▪ Waste collection ▪ Waste recycling ▪ Waste transportation
Additional Requirement	▪ Recommendation letter from waste association (not required but could be considered) ▪ Recommendation letter from Environmental Agency (not required but could be considered)

3.2.2.2 Implementation Schedule

The recommendation is to implement the program roadmap effectively from 2022 to 2024, with a pilot project carried out in 2021. Soft loan funds through the LPDB specifically for the MSME waste sector are allocated specifically and are expected to receive priority compared to other MSMEs. The implementation program and timeline are shown in Table 9.

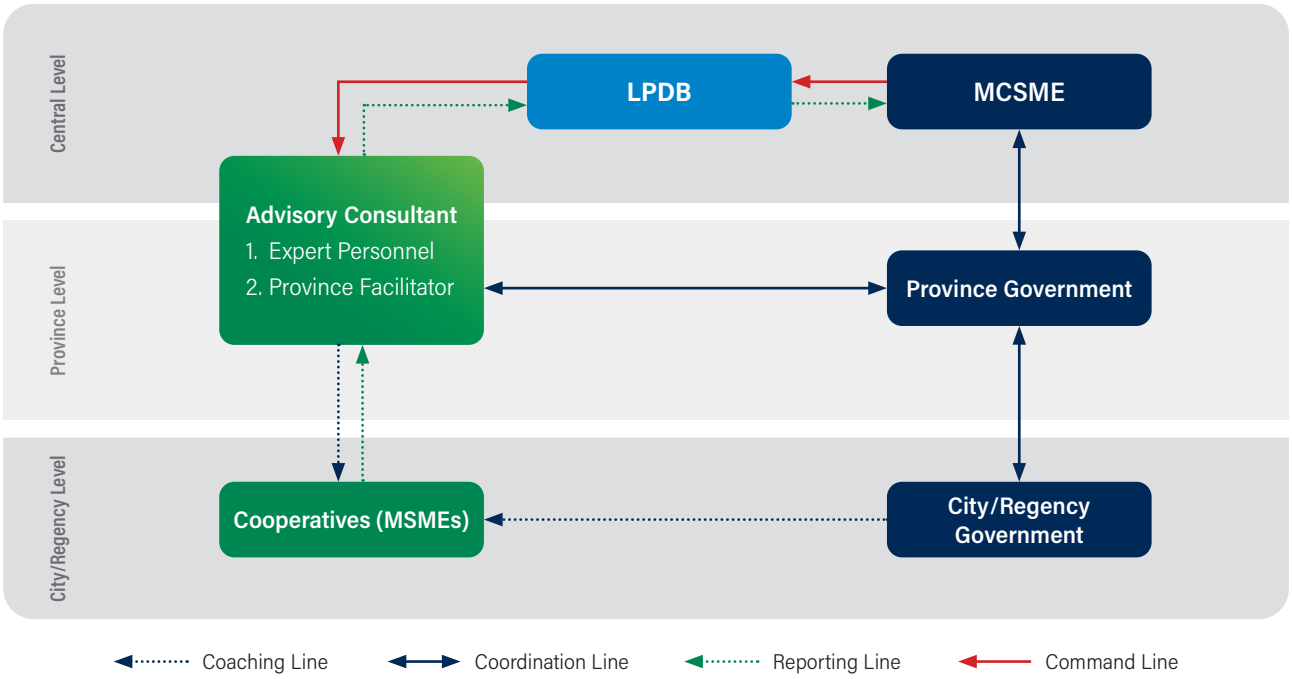
Table 9. Implementation Program

Phase	Year	Milestone
Respond	**2021**	▪ Identify and evaluate short-list of green recovery projects for waste MSMEs. ▪ Build stakeholder support for green recovery initiatives, especially with the Ministry of Cooperatives and Small and Medium Enterprises (MCSME). ▪ Implement the pilot project of the existing LPDB soft loan program to MSMEs through cooperative in East Java and Bali. ▪ Evaluate and prepare the final green recovery program for the waste sector. ▪ Develop Green Recovery Roadmap. ▪ Propose the Green Recovery Program for the waste sector.
Recover	**2022**	▪ Launch pilot projects for the proposed green recovery projects in the waste sector at Java Island and Bali Province. ▪ Identify preferred mechanism for longer-term Sustainable Funding Mechanism for Waste MSMEs.
Re-evaluate	**2023**	▪ Extend pilot projects to the large-scale national deployment of green recovery projects in waste sectors. ▪ Evaluate pilot projects and review Roadmap. ▪ Sustainable Funding Mechanism developed and progressed through relevant stakeholder consultation and approval processes.
Reward	**2024**	▪ Sustainable Funding Mechanism implemented and integrated into appropriate regulatory frameworks. ▪ Robust functioning Green Economy Ecosystem enabling effective green economy initiatives to be conceptualized, socialized, assessed, and implemented.

3.2.2.3 Organizational Structure

To support the Ministry of Cooperatives and MSMEs as well as the LPDB Work Unit, the allocation of special funding for the involvement of advisory and supervisory consultants is expected to further strengthen the control over the use of funds to the provincial and city/district levels and can be one of the keys to the success of the program. Figure 7 shows a proposed organizational structure for the fiscal stimulus program for waste MSME cooperatives.

Figure 7. Proposed organizational structure of the program



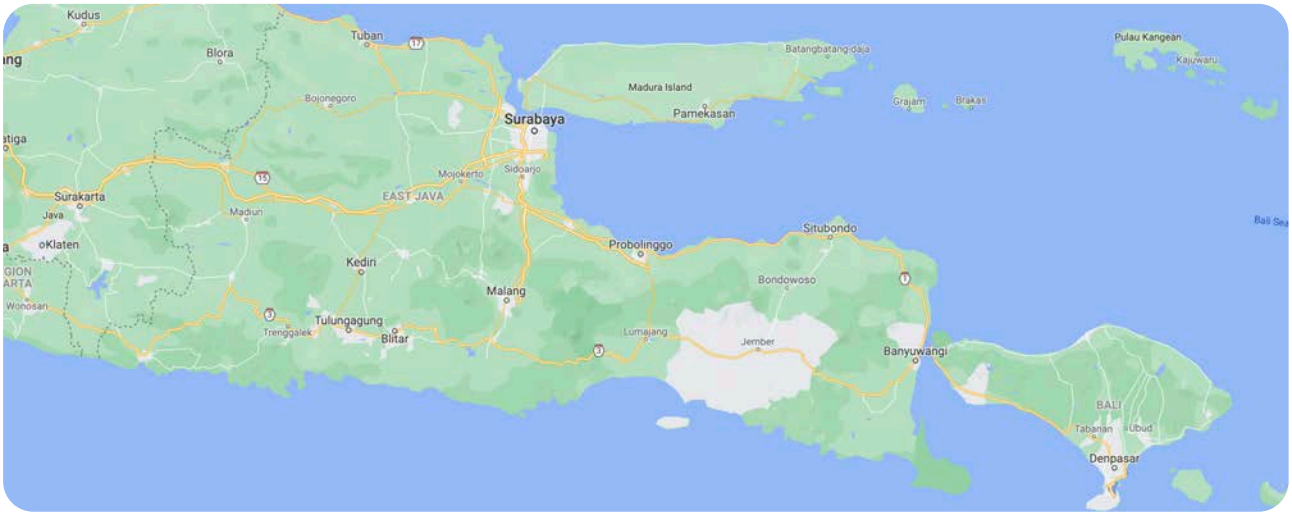
The Advisory Consultant group will work directly under the management of the LPDB and consist of experts and provincial facilitators who will manage the program through engagement, implementation, and monitoring stages of the program from 2022 to 2024.

3.2.2.4 Proposed Locations

From the analysis of the data on solid waste MSMEs that are actively functioning (data from the 3R TPS manager from the Ministry of PUPR, and data from the waste bank manager from the Ministry of Environment and Forestry), the highest total MSMEs in solid waste are in East Java Province. In addition, East Java Province also has a value chain of medium-large businesses and recycling factories that receive the most products from MSMEs in waste (Offtaker). Furthermore, East Java also has 10 national tourism strategic area destinations ("KSPN"). Hence, Bromo-Tengger-Semeru ("BTS"), 10 New Metropolitan Cities (Surabaya City), and Brantas Watershed ("DAS"), including 15 Priority DAS will be target areas under the existing project.

In addition, following the objectives of this program, namely in the context of post-pandemic national economic recovery, Bali Province was chosen as a priority location for the 2021 program, as it experienced the most severe economic conditions in Indonesia in 2020 (Khadafi 2020). Bali Province is close to East Java Province, making targeting both regions practically feasible and efficient. Furthermore, Bali Province has many MSMEs in waste (in the top 10 nationally) based on data from the Ministry of PUPR (TPS 3R) and KLHK (Waste Bank). It is predicted that there will be more MSMEs in waste, especially informal ones, in the two provinces above, so targeting these areas for the national economic recovery fund (PEN) for MSMEs in waste is a priority.

Figure 8. Locations of East Java and Bali Provinces which will be the focus of the program in 2021



3.2.3 Financial Cost

After implementation of the pilot project of the LPDB revolving fund in 2021 for waste MSMEs through cooperatives, this project aims to implement an additional and special budget coordinated by the Ministry of Cooperatives and MSMEs and LPDB in 2022. This budget is multi-year (cross-year) from 2022 to 2024 worth Rp 3.57 trillion, consisting of:

1. Rp 3 trillion in the form of soft loans to a target of 1,000 medium-sized formal business activities (Rp 100 million – 200 billion).
2. Rp 150 billion in the form of soft loans for 1,500 formal micro and small business activities (10–500 million).
3. Rp 250 billion in the form of soft loans for 5,000 informal business activities (registered and identified) (10–100 million).
4. Rp 170 billion of Safeguard funds (5% of the total program fund allocation) in the form of program assistance will be provided to LPDB to effectively manage the program. Funds for this program assistance can be in the form of organizing advisory consultants accompanied by field facilitators, assistance in the use of funds, entrepreneurship assistance, institutional improvement and market access, and waste management training for local governments. Safeguard funds can cover a multi-year basis (across years, proposed from 2022 to 2024). These funds may be adaptively managed and adjusted to the needs of the LPDB.

3.2.4 Economic Benefits

The recommendation for stimulus funds is expected to improve the national economy directly through the increasing value of recycled products managed by waste MSMEs. It is estimated that the distributed stimulus could double the volume of processed waste: average MSMEs that initially process 0.5–5 tons of waste/day could process 1–10 tons/day. With the support of a good waste sorting ecosystem at the source, 60% of organic waste, 14% of plastic waste and 9% of paper waste can be processed (KLHK, 2017). Therefore, it is estimated that 0.8-8 tons/day can be recycled.

If 7,500 MSMEs are given an economic stimulus, it is estimated that 6,000–60,000 tons of waste can be recycled every day, which has a value of up to Rp 3.45 trillion – Rp 34.5 trillion per year. Indirectly, this stimulus can also affect the efficiency of waste handling costs (transportation and final processing at the landfill) and increase the supply of raw materials for large-scale recycling industries, which will significantly impact the national economy.

3.2.5 Jobs Supported and Created

In terms of job creation, each MSME that receives stimulus support is estimated to be able to hire an additional 3–15 employees. This is based on an increase in processing capacity and is also based on field observations of the number of workers in MSMEs in waste. With the support for the target of 7,500 MSMEs in solid waste, 22,500–112,500 new employees can be added to the workforce, which will indirectly affect the welfare of thousands of scavengers and increase employment for large-scale recycling industries (off-takers) in Indonesia.

3.2.6 Environmental Benefits

The benefit of the stimulus to the waste sector is optimizing recycling efforts to reach 60,000 tons of waste every day. This value is equivalent to efforts to reduce greenhouse gas (GHG) emissions by ~9,589,343 tons CO_2/year or by ~158,077,471 tons CO_2 over 20 years. This calculation is based on the GHG calculation calculator method in developing countries. The calculation is carried out by considering the volume of waste that can burden transportation and processing activities at the landfill with a composition of 50% organic and 10% paper.

3.2.7 Monitoring, Evaluation and Development

Monitoring, evaluation, and program development will be carried out by Advisory Consultants under supervision from LPDB and MCSME in 2023 to 2024. The monitoring and evaluation mechanism can be carried out by conducting field visits to MSME cooperatives that have received support from the PEN program soft loans from LPDB. The advisory consultant will use the performance appraisal instrument to assess the increase in the functional level of MSMEs in solid waste.

The proposed assessment indicators consist of five aspects of governance consisting of:

1. Aspects of business/financial management (surplus and increasing finances, financial independence).
2. Operational, technical aspects (improvement of service performance, transportation, and waste management).
3. Institutional aspects (professional business management).
4. Regulatory aspects (implementation of policies, regulations, and SOPs for business activities).
5. Social and environmental aspects (active community involvement, increased employment opportunities, influence on reducing Greenhouse Gases (GHGs)).

The five aspects will be compiled in more detail by the advisory consultant in developing the assessment instrument. They will be a separate report to the LPDB and MCSME in evaluating the level of program success. To support low-carbon development efforts and encourage the role of MSMEs and support the national economy, there should be development efforts that can build a more optimal waste management ecosystem. The recommended development efforts are:

1. Other MSMEs in waste also receive attention from all related parties (government, private companies, educational institutions, etc.) to increase their functionality and usefulness towards increasing employment opportunities and improving the quality of the environment.
2. Improving solid waste management is also the key to various waste management efforts and initiatives. Based on a study from the Global Waste Management Outlook and the consultation of waste experts in Indonesia, the main problem of waste management in Indonesia is the lack of 1). law enforcement efforts, 2). allocation of costs for managing waste, and 3). loss of morals/morals-discipline-care-responsibility-honesty.

3.3 Energy Sector

3.3.1 Summary

The following is a proposal for a specific green recovery initiative for the energy sector developed as part of this Roadmap in 2021. The following description outlines the rationale, costs, benefits, and implementation plan of the initiative.

Table 10. Summary of Solar Rooftop Panels on Government Buildings Proposal

Stimulus Description	**Installing rooftop solar panels on 70 ministries/agencies buildings to comply with the regulation as stated in the Presidential Regulation No. 22/2017 on General National Energy Planning (Rencana Umum Energi Nasional – RUEN)**
2022 Budget Allocation	Rp 3.708 trillion (for the extension of rooftop solar panel installation on local government (province, municipality, regency)) ▪ Rp 210 billion of it is the total procurement and installation cost for 200kWp of solar (photovoltaic) panels on ministries/agencies buildings (14MWp of total installed capacity). The Rp 3.71 trillion is the total cost for extending the installation of solar panels 261.2 MWp on ministries, agencies, and local government buildings. ▪ Assumes a capital and installation (including logistics) cost is Rp 15 million/kWp. ▪ The recommended budget allocation does not include ongoing operation and maintenance costs of the panels, which are approximately 5% of investment cost per year in total over the 25 years expected lifespan of the panels. We assume this will be the responsibility of each ministry/agency. ▪ The Ministry of Energy and Mineral Resources (MEMR) will coordinate with each ministry/agency to specify the location of solar panel installation. ▪ Assumes average daily generation of electricity per installation is 3.5kWh/day/kWp; thus, electricity consumption reduction via the installation of solar panels on 70 ministries/agencies building is 15,261,400 kWh. In addition, the extension of solar panel installation to ministries, agencies and local government buildings will reduce electricity consumption at 284,734,120,000 kWh per year (after considering electricity exported to the PLN's network and the regulation of MEMR No. 16/2019).
Economic Benefits	▪ Based on an electricity tariff of Rp 1,444.70 per kWh (referring to P1-TR tariff) and investment cost of Rp 210 billion, this program will save electricity costs in the ministries/agencies buildings at Rp 22 billion per year. Excluding the operational cost, the investment cost of solar panel installation on 70 ministry and agency buildings will reach its break-even point in approximately 9.5 years. Furthermore, the extension of solar panel installation on ministries, agencies and local government buildings is estimated to save electricity costs at Rp 411.4 billion per year. ▪ In addition, direct investment in solar panels will help create economies of scale that should stimulate growth and new green technology businesses.
Employment Benefits	Estimated to involve at least 700 jobs in the construction phase for installation, logistics, and maintenance. Jobs in domestic manufacturing for the supply of panels and componentry will also be maintained.
Climate Benefits	▪ Estimated to avoid at least 339,624 tCO_2 in total over 25 years. ▪ The extension of solar panel installation on ministries, agencies, and local governments buildings from 2023 to 2024 will avoid 6,673,660 tCO_2 in total over 25 years.

Implementation Mechanism	▪ We propose the solar panel installation costs are appended to the regular budget of MEMR or each ministry/agency. In addition, we propose the costs for the extension of solar panel installation on ministries, agencies, local governments buildings are appended to the regular budget of MEMR or each ministry, agency, and local government. ▪ Ministry of National Planning/BAPPENAS and MEMR will coordinate with each ministry/agency (including each local government for the program extension) to specify the program's requirements, such as budgeting, location of solar panel installation, operation, and maintenance, etc. ▪ MEMR will coordinate with each ministry or agency (including each local government for the program extension) to procure solar panel installation. ▪ If the government cannot allocate funding for this program, due to focusing the budget on COVID19 recovery, it can cooperate with PV installation providers through leasehold. In this cooperation, the installation, operation, and maintenance of solar panels will be funded by the provider. At the same time, the government only pays for the electricity usage produced by the solar panel.

3.3.2 Background

Electricity supply and demand is a vital component of the Indonesian economy. Energy is needed to drive the economy, such as for transportation, industry, building and household sectors. Until now, Indonesia has relied on fossil-based energy to meet its energy needs. Even though Government Regulation No. 79/2014 on National Energy Policy has specified the share of renewable energy needs to grow to 23% of the energy mix in 2025. Yet, until 2020 the renewable energy contribution was still 11.5% of the energy mix (ESDM, 2021). With an increase of 500 MW per annum in the last five years, the growth of power plants sourced from renewables is not expected to reach the targets established in the National Energy Policy (source: MEMR; Winona 2021).

An opportunity exists to replace fossil-based energy with renewables, considering the abundant potential of renewables in Indonesia. If such possibilities can be utilised optimally, it can help to achieve the target of renewables' share and greenhouse gas (GHG) emission reductions as stated in Indonesia's NDC. Other benefits include lower-cost electricity, cost savings on subsidies, reduced emissions, new green jobs and green businesses, and increased reliability of electricity supply.

Unfortunately, renewable energy development faces significant hurdles, such as the government's lack of commitment and capacity to develop renewables. The regulation of renewables pricing should be competitive with a coal power plant. However, there are insufficient government incentives for renewables development and procurement of renewable energy. The current policy focuses on small-scale solar projects compared with large-scale projects focus in the coal sector. This does not prioritise renewable energy sources (Indrawan, 2019). Considering these hurdles, it would be hard to achieve the renewable energy share target by 2025.

The government must utilise renewable energy, as per Presidential Regulation No. 22/2017 on National Energy General Planning (Rencana Umum Energi National – RUEN) in Strategy for Main Policy 3 about National Energy Resource Utilization, i.e., to increase the solar energy utilisation implemented in transportation, industry, commercial and household buildings. In accordance with these policy measures, there is a mandatory solar energy utilisation of at least 30% of rooftop space area in all central and local government buildings, as shown in Table 11.

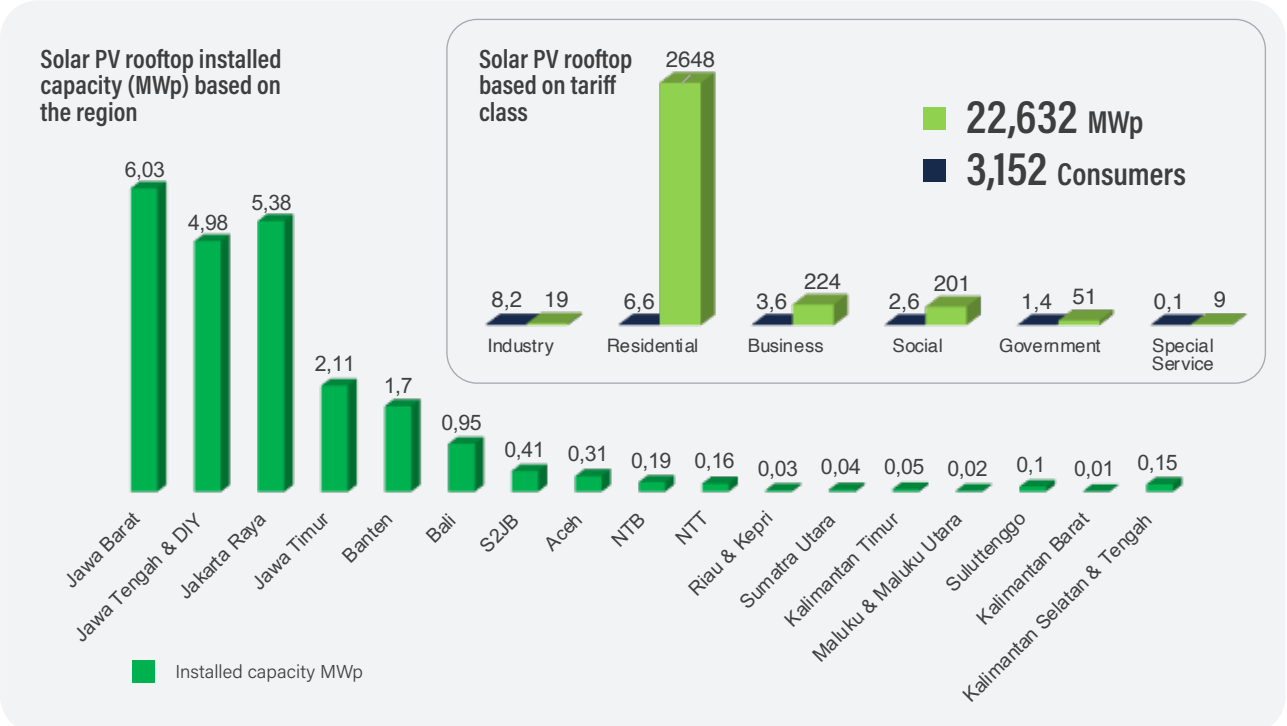
Table 11. Mandatory in Solar Rooftop Utilisation

Chapter of Main Policy The National Energy Resource Utilization	Program	Activity	Institution	Instrument	Period
Increase the solar energy utilization implemented in transportation, industry, commercial and household buildings	Solar energy utilization in government buildings	Enact the mandatory solar energy utilization by at least 30% of rooftop space area in all central and local government buildings.	MEMBER	Strategic plan of ministry/agency	2019–2050

Source: Presidential Regulation No. 22/2017 on RUEN, Annex II

In accordance with the Presidential Regulation, all buildings owned by the central and local governments should be installed with solar rooftop panels. However, few government buildings have been installed with rooftop solar, for example, MEMR buildings, the Presidential palace and Bogor Palace, and the DKI Jakarta government building. In Figure 9, until January 2021, solar rooftop panels have been installed to 3,152 customers with an installed capacity of 22.63 MWp, including 1,547.83 kWp that have been installed in government buildings (referring to Tariff "P" group). The main problems regarding this issue are limited funding from central and local governments, lack of concern and knowledge from government officials about solar panel installation mandates, and lack of knowledge from government officials about technical issues in solar panel installation.

Figure 9. Installed Solar PV Rooftop per February 2021



Source: DGNREEC, MEMR

Therefore, to support the achievement of the share of renewables target of 23% of the energy mix in 2025, as well as modelling best practices to the overall population, the government should implement the program of solar rooftop panel installation in government buildings as per Presidential Regulation No. 22/2017.

3.3.3 Description of Proposal

Solar Panel Rooftop Installation Initiative for Government Buildings 2022 to 2024

The government will install solar panels in buildings managed by 70 ministries/agencies in 2022. Each ministry/agency will receive an installation quota of 200 kWp installed on one or more buildings managed by each ministry/agency. Hence, the total installed capacity of solar panels is 14 MWp.

The next phase, solar panel installation on government buildings, will be extended in 2023–2024 for ministries, agencies, and local government institutions. Each ministry/agency will receive an additional quota of 200 kWp in 2023–2024. Hence, it will receive a total of 600 kWp. Each provincial government will receive 400 kWp installed in 2023–2024, or 200 kWp per year. Each regency or municipality will receive 400 kWp installed in 2023–2024. The solar panel in municipalities will be installed iteratively. The Ministry of National Planning/BAPPENAS and MEMR will coordinate with municipalities to schedule the solar panel installation each year. Thus, the total solar panel installation in government buildings between 2022 to 2024 is 261.2 MWp (see Table 12).

Table 12. Solar Panel Installation Plan on Government Buildings

Solar panel installation target	2022	2023	2024	Total
Ministry and Agency	14	14	14	42
Province		6.8	6.8	6.8
Regency/Municipality		102.8	102.8	205.6
Total Installed Capacity	**14**	**123.6**	**123.6**	**123.6**

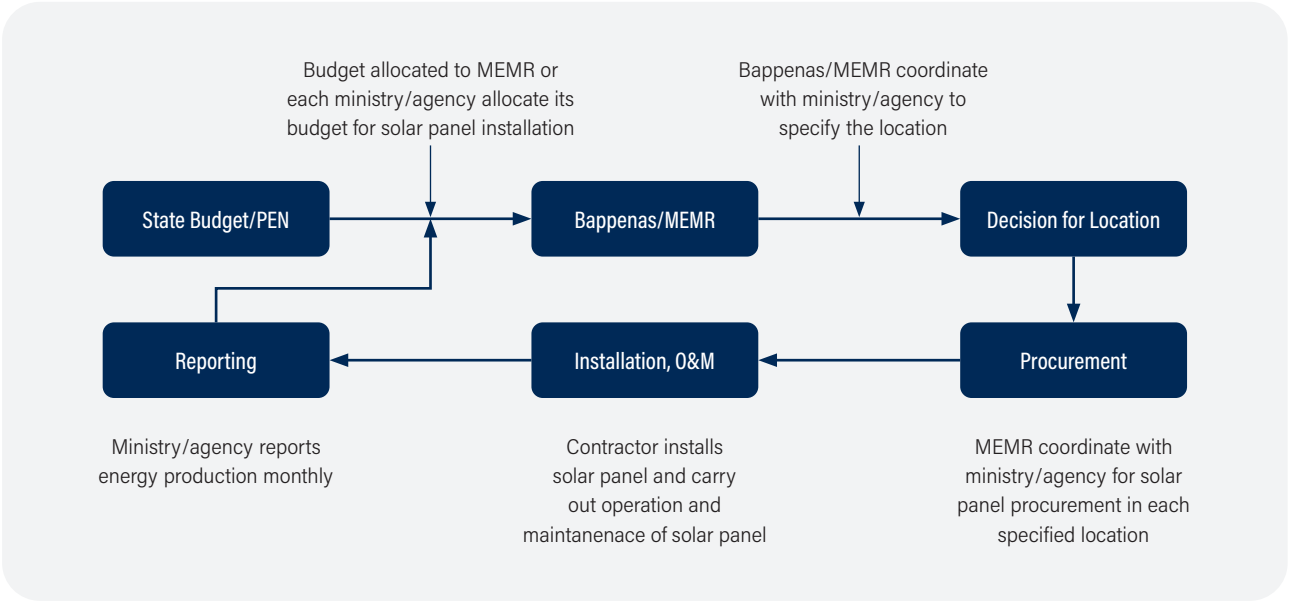
3.3.4 Implementation Plan

The solar panel installation is expected to be a major project and will contribute to the benefits of MP25: to increase the energy share and GHG emission targets. Therefore, required funds for this program in 2022 are proposed to be appended to the budget of MEMR. On the other hand, BAPPENAS has proposed to each ministry/agency to allocate funding to implement the solar PV rooftop installation in their Government Work Plan 2022.

The Ministry of National Development Planning/BAPPENAS and MEMR will coordinate with each ministry/agency to specify the location of solar panel installation and operational costs provision during the lifespan of solar panels. Therefore, the quota of 200 kWp for each ministry/agency can be installed in one or more locations, depending on the agreement between MEMR and each ministry/agency. Furthermore, solar panel locations in regions will be decided together by MEMR and local governments for the extension of the solar panel installation scope in regions.

By referring to the agreement of solar panel location, MEMR will coordinate with each ministry/agency, including local governments, to undertake the required procurement per specified solar capacity panels in each location. The selected contractor will be responsible for installing and maintaining the equipment during the economic lifespan of the solar panel.

Figure 10. Mechanism of solar panel procurement



In the case the government cannot allocate funding for this program, it can cooperate with PV installation providers through leasehold agreements without providing funds for the installation. In this scheme, the government only pays for the electricity usage produced by the solar panel based on the agreed tariff. Thus, the implementation mechanism can be carried out as shown in Figure 11.

Figure 11. Mechanism of solar panel procurement

For the solar PV rooftop system procurement to be coordinated, MEMR and the Ministry of National Planning/BAPPENAS will coordinate with each government building management (not only on central government but also in local government). The aims of the coordination are to obtain the same understanding regarding the mandatory solar panel installation as per Presidential Regulation No. 22/2017, to explain the benefits of solar panel installation in pursuing the targets of renewable energy share in the energy mix and NDC fulfilment, and to explain technical requirements of solar panel technology and the business model for solar panel installation.

Related to the leasehold agreement, there are some options for the procurement of solar PV rooftop provider service. First, procurement could be organized by MEMR; second, procurement could be done through the National Public Procurement Agency (Lembaga Kebijakan Pengadaan Pemerintah – LKPP); third, or procurement could be done by each ministry/agency/local government. In this case, it would be important that the installation services are listed in LKPP.

It is also important to mention that it would be important that MEMR prepares the technical guidance/bidding document for the procurement process.

For the procurement of service providers, it would be essential to develop parameters for selecting the provider through a reverse auction method, which means selecting the best provider that offers the most benefits for building management. These parameters are among others, but not limited to:

1. Provider proposes tariff (basic tariff is referred to the government building tariff group, P1-TR, at Rp1,444.70 per kWh) for a certain period until the provider's investment would be paid back by investors, e.g., tariff for the first 15 years.
2. Provider proposes tariff after the payback period, e.g., for year 16 to 25 years, to cover O&M costs.
3. Provider determines conditions surrounding the decommissioning of the solar PV rooftop system after the termination of the contract.

As a note, MEMR has already prepared bidding documents to undertake the solar PV rooftop installation used for internal needs and external users. Hence, to install solar panels on government buildings via cooperation with the PV provider company, MEMR can use its bidding documents as a reference and adjust in the new bidding documents.

3.3.5 Organizational Structure

The installation of the solar PV rooftop system will involve various parties, starting with BAPPENAS and MEMR responsible for planning and coordinating the solar PV rooftop program, ministry/agency/local government as the location of the projects, PLN, and solar PV rooftop service provider. The tasks of these parties can be seen in the table below:

Table 13. Task distribution for solar PV rooftop installation

Stage	Bappenas	MEMR	Ministry/Agency/ local government	PLN	PV Installer
PLANNING	Coordinate with ministry/ agency and local government so that solar PV rooftop installation program will be include in the government working plan for 2022–2024	Provide guideline for the installation of solar PV rooftop. Including in the guidance will be selection of location, specification, of the solar PV rooftop system, etc			
		Prepare bidding document template. Including in the bidding document template would be the terms and conditions for solar PV Rooftop service providers			
		In case budget would be allocated in each ministry/ agency/local government, MEMR has to communicate with each ministry/agency/ local government about the importance of installing solar PV rooftop, technical requirement for the installation and allocating the budget for it			

FUNDING	In case using government budget, communicate with Ministry of Finance so that required budget could be allocated in state budget				
		In case the program would be implemented centrally, to include the program in the MEMR workplan for 2022–2024 and propose budget for it			
					In case no funding is available from government budget, PV installer need to arrange own financing for the installation of the solar PV rooftop under the leasehold agreement
PROCUREMENT		In case budget is allocated centrally, conduct procurement of the solar PV rooftop system and select the business model			
		In case the budget will be allocated by each ministry/ agency/local gov, monitor and supervise the procurement, if required	In case the budget will be allocated by each ministry/agency/ local gov, conduct procurement based on the bidding document template provided by MEMR and select service provider		
			In case no funding is available from government budget, bidding will be conducted to select service provider under leasehold agreement		Service providers participate in the bidding for service provider under leasdehold agreement
INSTALLATION			In case the installation will be organized by each ministry/agency/ local gov, register the installation plan to PLN	Install export-import meter	Install the solar PV rooftop system
				Commisioning the solar PV rooftop system according to the regulation	Commisioning
REPORTING	Monitor that the implementation of the program would help meeting the target of the National Mid-term Development Plan 2020–2024	Recieve the monthly production of solar PV rooftop syst em	Report monthly production	Billing for the electricity usage	Report the monthly production

3.3.6 Financial Cost

The solar panel installation cost in 2022 is expected at Rp 210 billion. This assumes an installation cost is Rp 15 million/kWp. Therefore, we propose Rp 210 billion should be budgeted in 2022 and installation of the panels on 70 ministries/agencies be completed by the end of 2022. Note that the recommended 2022 budget allocation does not include ongoing operation and maintenance costs of the panels, which are approximately 5% of investment cost per year over the 25 years expected lifespan of the panels. We expect these ongoing operation and maintenance costs will be funded through the routine budget of the ministry/agency. MEMR will coordinate with each ministry/agency to specify the location of solar panel installation effectively. For the program's extension to other ministries, agencies, and local governments in 2023–2024, it needs additional costs at Rp 3.71 trillion.

Table 14. Solar Panel Installation Costs

Solar Panel Installation Target	2022	2023	2024	Total
Total Installed Capacity	14	123.6	123.5	261.2
Total Investment Cost (Rp million)	210	1,854	1,854	3,918

3.3.7 Funding Options

Currently, the government focus is on COVID19 recovery. Thus, there is a possibility that the government cannot allocate funding for the installation of solar panels on government buildings. Therefore, an option that could be taken is a leasehold cooperation scheme with PV installers. This cooperation can be undertaken if the provider has KBLI 77395 (Leasehold and Business Lease without Option Right in Mining and Energy Machines and Equipment, or in Indonesian language: Aktivitas Penyewaan Dan Sewa Guna Tanpa Hak Opsi Mesin Pertambangan Dan Energi Serta Peralatannya). Another option is using a leasing model under the Financial Service Authority (Otoritas Jasa Keuangan – OJK) regulation. Using this scheme, the building management will receive funding from the lessor to develop/build the solar panel. This scheme is somewhat unsuitable given the requirement of solar panels on government buildings, as the building management can acquire the asset after the termination of the contract.

Preliminary discussions have been undertaken with two PV installation companies; they demonstrated interest in solar panel installation using the leasehold method. A business model offered is a solar panel leasehold for a certain period, where the building management pays leasing fees for energy produced by the solar panel. Using this method, the PV installer company will be responsible for operating and maintaining the equipment during the cooperation period. The government, for example, can offer lease fees that are equal to electricity bills for the government buildings for 15 years, and for the next 16–25 years, the lease fees can be paid based on maintenance cost. Via this business model:

- The government does not need to provide funding for solar panel procurement; it only has the responsibility to pay lease fees that equals the energy produced.
- The PV installation company has the responsibility to operate and maintain the equipment. Thus, the risk of technology/operations lies in the PV installer company. Therefore, if a problem occurs or the equipment does not work, the government does not need to pay anything since the contract is a leasehold method.

On the other hand, by using this model, the assets from the solar panel system cannot be transferred to the government. However, this ownership transfer is not vital, since, in the next 25 years, the technology will be developed further. Thus, the government can replace the solar panel instruments with a new and more efficient technology instrument and a new business model that can provide benefits. Another aspect that needs to be considered is the decommissioning of solar panels after the termination of the contract. This aspect can be incorporated in the leasehold contract clause.

3.3.8 Jobs Supported and Created

The solar panel installation on ministries and agencies buildings in 2022 with a capacity of 14 MWp is estimated to involve 700 jobs directly, if each 200 kWp capacity installation will involve ten workers. The workers will be involved in the construction phase for installation, logistics, and maintenance. Moreover, if the extension occurs for installation capacity at 261.2 MWp, new jobs could be created for 13,060 people. In addition, jobs in domestic manufacturing for the supply of panels and componentry could also be maintained.

3.3.9 Economic Benefits

The solar panel installation in 70 ministries/agencies buildings with a capacity of 200 kWp and average daily electricity generation of 3.5 kWh/day/kWp will lead to electricity consumption saving imported from PLN at **15,261,400 kWh**. Based on the MEMR Regulation No. 16/2019, a capacity cost is charged for this installation for the industry segment, i.e., total capacity of the inverter (kW) x 5 hours x electricity tariff. While the electricity exported to the PLN network will be priced at 65% of the total exported electricity. This estimate is equivalent to the capacity of a diesel-powered plant 2.8 MW with a capacity factor of 70%.

Based on electricity tariff P1-TR at Rp 1,444.70 and investment cost Rp 210 billion, this program will save electricity cost in the ministries/ agencies buildings at Rp 22 billion per year. Excluding the operational cost, the investment cost of solar panel installation on 70 ministry and agencies buildings will reach its break-even point in approximately 9.5 years. The extension of solar panel installation in 2023–2024 with a total capacity of 261.2 MWp will save electricity consumption imported from PLN at 284,734.12 MWh per year and save electricity costs of Rp 411,4 billion per year. Besides electricity cost-saving, this program is estimated to drive the industry sector in solar panel installation, logistics for the distribution of solar panel components, installation services, and operation and maintenance services.

3.3.10 Environmental Benefits

The solar panel installation on 70 ministry and agencies buildings is estimated to avoid at least 339,624 tCO_2 in total over 25 years, assuming the network emission at 0.8 tCO_2/MWh. The extension of solar panel installation on ministries, agencies, and local governments buildings from 2023 to 2024 will avoid 266,946.4 tCO_2 per year or 6,673,660 tCO_2 in total over 25 years.

3.4 Plantations Sector

3.4.1 Summary

The Plantation Rejuvenation Program aims to increase the productivity of plantation crops, increase the income level of farmers through the provision of direct cash assistance when crops have not yet matured to productive levels, and reduce the negative impacts of deforestation driven by farmers to improve their agricultural yields. The establishment of farmer corporations also accompanies the program to optimize their income by implementing corporate principles in production, processing, and marketing activities.

The Plantation Rejuvenation Program consists of three activities, namely rejuvenation activities, Direct Cash Assistance (BLT) granting, and corporate formation. Each program will last for three years. Rejuvenation activities consist of establishing nurseries in the first year and planting and care in the second and third years. Thus, the program will last for three years, while the provision of BLT will take place in the second and third years. The targets per project are land rejuvenation of 107,208 hectares, the provision of BLT for up to 151,933 farmers, and the establishment of 46 corporations, as shown in Table 15.

Table 15. Scope of Rejuvenation Program, 2022–2024

Indicators	2022	2023	2024	Total
Land Sized (ha)	107,208	-	-	107,208
BLT recipients (people)		151,933	-	151,933
Number of Corporations (unit)	46	-	-	46

3.4.2 Implementation Mechanism

The Plantation Rejuvenation Program, which consists of rejuvenation activities, BLT granting, and corporate formation, will last for three years per project (see Figure 12) with the following details of activities:

First Year

This will focus on the preparation and breeding, and establishment of farmer corporations. This year consists of several activities, namely, setting the criteria of Prospective Farmers and Prospective Land (CPCL) beneficiaries; verify; assign beneficiaries; establishing a companion (cultivation, processing, and marketing) and the preparation of the Proposed Plan of Activities (RUK). This stage will also carry out the preparation of replanting land (land clearing etc.) and plant nursery management for the preparation of planting stock for the next budget year. From the corporate aspect, the project will focus on forming organizations, increasing the capacity of farmers, and providing corporate facilities and infrastructure.

Second Year

This will focus on planting and development activities of farmer corporations. There will be a disbursement of funds for cropping and intercropping and assistance to participant farmers. In addition, corporate development will be carried out through increased downstream capabilities (increased in added product value) and marketing.

Third Year

This will focus on the maintenance of plants and corporate development by improving corporate capabilities in downstream activities (such as by an increased product value) and marketing, including the development of a sustainable market network.

Figure 12. Rejuvenation Program Activity Flow

3.4.3 Focal Points and Locations

Rejuvenation activities focus on several plantation crops that are the government's primary target, namely cocoa, coffee, rubber, coconut, and oil palm. The development of these will improve productivity, increase the availability of industrial raw materials, and improve export activities. These crops are primarily grown by rural smallholders, so these activities will help boost rural incomes and reduce poverty levels in rural areas.

Location determination is done based on several criteria. These criteria include accessibility of rejuvenation area from plantation crop regions, the ratio of damaged or non-yielding crop area, regional poverty rates, and proximity to processing facilities. During implementation, location determination is also influenced by the local government's readiness to support these activities. The willingness of the local governments includes a commitment to help establish Prospective Farmers and Land Candidates and the provision of supporting budgets for extension workers. This will also support the sustainability and future development of such programs for similar activities.

Based on the screening results from the Directorate of Plantation of the Ministry of Agriculture, the first project, which could begin in 2022 if all stakeholder agrees and the project deemed possible, will be conducted in 46 districts. Cocoa plants will be distributed to as many as 11 districts, coffee plants to as many as 10 districts, rubber plants to as many as eight districts, coconut plants to as many as 12 districts, and oil palm to as many as five districts.

3.4.4 Financial Costs

Throughout the period 2022–2024, the plantation rejuvenation program can only be done for one region in full. With reference to the rejuvenation costs incurred by the Ministry of Agriculture, the required budget reaches Rp 6.7 trillion in the period 2022–2024 (Table 16), consisting of Rp 806 billion in 2022, Rp 4.3 trillion in 2023, and Rp 1.6 trillion in 2024. The budget in the first year is the lowest because the provision of new BLT is carried out in the second year when replacing old or damaged plants with new plants takes place.

Table 16. Estimated Budget for Plantation Rejuvenation Program, 2022–2024

Activities				2022		2023		2024		Total
		Target	Unit	Unit of Charge (Rp million)	Budget (Rp Million)	Unit of Charge (Rp million)	Budget (Rp Million)	Unit of Charge (Rp million)	Budget (Rp Million)	Budget (Rp Million)
I	Plantation Plant Rejuvenation*:	107,208	Hectares	-	749,435.0	-	2,997,740.0	-	333,403.3	4,080,578
	a. Coffee	12,243	Hectares	9.8	119,932.4	39.2	479,729.7	1.0	12,304.2	611,966
	b. Cocoa	23,987	Hectares	7.7	185,526.3	30.9	742,105.0	1.0	23,608.1	951,239
	c. Rubber	15,223	Hectares	6.7	101,662.2	26.7	406,649.0	5.8	87,631.2	595,942
	d. Coconut	39,531	Hectares	8.7	342,314.1	34.6	1,369,256.4	5.3	209,859.8	1,921,430
	e. Oil palm**	16,225	Hectares							
II	Granting Farmers BLT***	151,933		-	-	-	1,225,195.8	-	1,225,195.8	2,450,392
	a. Coffee	20,831	People			8.1	167,981.2	8.1	167,981.2	335,962
	b. Cocoa	30,904	People			8.1	249,209.9	8.1	249,209.9	498,420
	c. Rubber	11,188	People			8.1	90,220.0	8.1	90,220.0	180,440
	d. Coconut	81,038	People			8.1	653,490.4	8.1	653,490.4	1,306,981
	e. Oil palm	7,973	People			8.1	64,294.3	8.1	64,294.3	128,589
III	Agricultural Corporation Development ****	46	Location	1,233.3	56,733.3	1,233.3	56,733.3	1,233.3	56,733.3	170,200
				-	**806,168.3**		**4,279,669.1**		**1,615,332.4**	**6,701,170**

3.4.5 Jobs Supported and Created

The Plantation Rejuvenation Program is estimated to create a new workforce of 152,000 people. In addition, the indirect labour that can be created, especially for breeding, transportation, and post-harvest processing, is estimated to reach at least 20,000 people. Thus, this program can provide benefits to approximately 172,000 national workers.

3.4.6 Economic Benefits

The Plantation Rejuvenation Program will provide numerous economic benefits. First, it will increase farmers' incomes and increase cash flow for the rural poor. Second, this program will increase the production of plantation crops. Based on calculations using the ARIMA model, it is estimated that plantation rejuvenation will increase output by about 7–15%. Using each commodity's average international price in 2020 (as a relevant benchmark), this program can produce at least Rp 25 trillion per year once crops are in their productive period. Third, the indirect economic impact of this program is the increase in the supply of raw materials for the manufacturing industry, which can reach at least Rp 5–10 trillion per year.

3.4.7 Environmental Benefits

The impact of plantation rejuvenation has a considerable benefit to the environment and carbon sequestration. This program can reduce deforestation activities, which are commonly used to increase the production of agricultural activities. Deforestation is a major contributor to Indonesia's carbon emissions. Crop rejuvenation also absorbs carbon as plantation stock matures. As shown in Table 17, if the rejuvenation of all damaged or unproductive plantation crops occurs, then the potential for avoidable carbon sequestration can reach 79 million tons of organic carbon (C) over the life of the plantations. Additional carbon sequestration will also be added by intercropping vegetation during the process of replacing trees so that the release of carbon due to the replacement of old or damaged trees with new trees can be reduced.

Table 17. Ecosystem Carbon Stocks After Planting People's Plantation Crops

Land Use	Land Sized (ha)	Carbon Stock (ton C/ha)		
		Forest (Before Planting)	Plantation (After Planting)[6]	Change in Carbon
Oil Palm	162,247	137.19[1]	63	- 12,037,085.59
Rubber	152,226	134.29[2]	63	- 10,852,224.76
Cocoa	239,868	137.62[3]	63	- 17,898,935.81
Coffee	122,432	134.29[4]	63	- 8,728,197.43
Coconut	395,308	137.62[5]	63	- 29,497,866.66
Total	**676,773**	**134.29**	**63**	**- 79,014,310.24**

Source: Ministry of environment (2003), processed

Description:
carbon sequestration of dry forests in; (1) Kalimantan, (2) Sumatra, (3) Sulawesi, (4) Sumatra, (5) Sulawesi, (6) plantation crops based on KLH studies (2003).

3.4.8 Monitoring, Evaluation, and Development

Monitoring aims to compare the implementation performance in the field with cash-intensive rejuvenation programs so that the program expenditures and execution are transparent. It will also help to identify improvements that can be made if the program faces obstacles or does not run according to the proposal. Evaluation will also take place to assess the performance, problems, solutions, and recommendations for future improvements.

Monitoring and evaluation will be conducted in three stages: (1) desktop analysis, namely reviewing various documents related to the program, among others regulations related to this program (such as the Activity Plan, Technical Guidelines, matrix of activities, and reports on the development and results of the program implementation); (2) conduct a visit to the field, namely the location of rejuvenation and corporations that have been established; (3) conduct discussions and interviews with local governments, extension workers, farmers, and corporate farmer administrators. The results of monitoring and evaluation will be used to improve the program in the following project stages.

4 Conclusion

In summary, this Roadmap serves to deliver two key post-COVID green recovery Outcomes. The first outcome is to see green recovery initiatives acknowledged as priorities in Indonesia's national development planning and budgeting processes. The second outcome is that there are sufficient funding pathways secured to sustain longer-term green economy development.

The Roadmap addresses the five main reasons why green recovery initiatives are not currently prioritised in the Indonesian national budgeting processes. These include how green economy initiatives are generally perceived as 'less urgent', how the Indonesian government's financial resources are presently very constrained limited, and how the PEN has not prioritised green recovery initiatives.

This Roadmap provides a framework to address these challenges in the form of five strategies, 12 actions and eight corresponding milestones. The action plan is to be implemented over four phases from 2021 (Respond), 2022 (Recovery), 2023 (Recovery and Re-evaluate) and 2024 (Reward). The action plan includes a Stakeholder Engagement Plan (Table 4) and three sector-specific pilot projects (Table 5). The pilot projects are from the waste, energy, and plantations sectors. In total, the three proposed pilot projects should sustain and create more than 300,000 jobs in the next three years and avoid more than 400 million tCO_2e over 25 years.

Robust persistent advocacy and continued international donor support is now required to implement this Roadmap and enable green recovery principles to be prioritised in the Indonesian national budgeting processes.

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GREEN RECOVERY
ROADMAP INDONESIA 2021–2024

Building Back Better Low Carbon Development Post-COVID19

GREEN RECOVERY
ROADMAP INDONESIA 2021–2024

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