



FISCAL POLICY AGENCY  
MINISTRY OF FINANCE  
REPUBLIC OF INDONESIA



# Public Finance for Climate Change in Indonesia

2016 - 2018







# **PUBLIC FINANCE FOR CLIMATE CHANGE IN INDONESIA 2016 -2018**

**Fiscal Policy Agency  
Ministry of Finance Republic of Indonesia  
2019**

# Public Finance for Climate Change in Indonesia 2016-2018

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# LIST OF ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ADIK	Architecture and Performance Information
AF	Adaptation Fund
AFD	Agence Française de Développement / French Development Agency
APBN	State Budget
APBD	Subnational Budget
AusAID	Australian Agency for International Development
BAPPENAS	Ministry of National Development Planning of the Republic of Indonesia/ National Development Planning Body
BBM	Fuel Oil
BCA	Bank Central Asia
BIG	Geospatial Information Board
BJB	Bank Jabar Banten/Banten West Java Bank
BKF	Fiscal Policy Agency
BLU	Public Services Agency
BMKG	Meteorology, Climatology & Geophysics Agency
BNI	Bank Negara Indonesia/State Bank of Indonesia
BNPB	National Disaster Management Agency
BPDLH	Environmental Fund Management Agency
BPPT	Agency for the Study and Application of Technologies
BRI	Bank Rakyat Indonesia/Indonesia's Citizenry Bank
BRIS	Bank Rakyat Indonesia Syariah/Indonesian Citizens Bank Sharia
BPS	Central Statistics Board
BUR	Biennial Update Report
CCFF	Climate Change Fiscal Framework
CCPL	Climate Change Program Loan
CER	Certified Emission Reduction
CICERO	Centre for International Climate and Environmental Research
CIO	Climate Investor One
CM1	Counter Measure 1
CM2	Counter Measure 2
COP	Conference of the Parties
CPI	Climate Policy Initiative
CRI	Climate Risk Index

CSOs	Civil Society Organizations
CSR	Corporate Social Responsibility
CTF	Clean Technology Fund
DAK	Special Allocation Fund
DANIDA	Danish Development Agency
DAU	General Allocation Fund
DBH	Sharing Fund
DFI	Development Finance Institution
DFID	United Kingdom Department for International Development
DIDs	Subnational Incentive Fund
Ditjen Migas	Directorate General of Oil and Gas, Ministry of Energy and Mineral Resources
DJA	Directorate General of Budget, Ministry of Finance
DJP	Directorate General of Taxes, Ministry of Finance
DJPb	Directorate General of Treasury, Ministry of Finance
DJPK	Directorate General of Fiscal Balance, Ministry of Finance
DJPPI	Directorate General of Climate Change, Ministry of Environment and Forestry
DJPPR	Directorate General of Budget Financing and Risk Management
DSP	Directorate General of Budgeting System, Directorate General of Budget
EBRD	European Bank for Reconstruction and Development
EFT	Ecological Fiscal Transfer
EIB	European Investment Bank
ESMF	Environmental and Social Management Framework
ESMS	Environmental and Social Management System
ESS	Environmental and Social Safeguard
GBF	Green Bond Framework
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IADB	Inter-American Development Bank
ICCTF	Indonesia Climate Change Trust Fund
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
JMA	Joint Mitigation Adaptation
Kemen ATR/BPN	Ministry of Agrarian Affairs and Spatial Layout
Kemenhub	Ministry of Transportation
Kemenkeu	Ministry of Finance

Kemenkumham	Ministry of Law and Human Rights
Kemenperin	Ministry of Industry
Kementan	Ministry of Agriculture
KEM-PPKF	Macroeconomic Policy and Principles of Fiscal Policy
KESDM	Ministry of Energy and Mineral Resources
KfW	Kreditanstalt für Wiederaufbau / German Development Bank
KKP	Ministry of Maritime Affairs and Fisheries
KLHK	Ministry of Environment and Forestry
KPUPR	Ministry of Public Works and Housing
KRISNA	Collaboration of Budget Performance Planning and Information
KUBL	Environmentally Sound Business Activities
LCNG/LNG	Liquefied to Compressed Natural Gas/Liquefied Natural Gas
LED	Light-Emitting Diode
LJK	Financial Services Agency
LPGLED	Liquified Petroleum Gas of Light-Emitting Diode
LRT	Light Rail Transit
MDB	Multilateral Development Bank
M/Is	Ministries/Institutions
MIE	Multilateral Implementing Entities
MRV	Measurement, Reporting and Verification
NCF	National Climate Fund
NDA	National Designated Authority
NDC	Nationally Determined Contribution
NFP	National Focal Point
NIE	National Implementing Entities
ONF	Operational Focal Point
OJK	Financial Services Authority
OPIC	Overseas Private Investment Corporation
PAD	Locally Generated Revenue
PEP	Monitoring, Evaluation and Reporting
UN	United Nations
PPAs	Power Purchase Agreements
PBK	Performance-Based Budgeting
PDB	Gross Domestic Product
Pefindo	Credit Rating Agency in Indonesia
Pemda	Subnational Government
PPF	Political Focal Point
PJBTL	Contract of Purchase and Sale of Electric Power
PJUTS	Solar Powered Street Lighting

PKPPIM	Center of Climate Change and Multilateral Finance Policies, Ministry of Finance
PLN	State Electricity Company
PLTS	Solar Powered Electric Generator
PNBP	Non-Tax State Revenue
POJK	Financial Services Authority Regulation
PPSLP	National Research and Development Laboratory for Farmland Resources
ProKlim	Climate Village Program
RAD GRK	Subnational Action Plan on Reductions in Greenhouse Gas Emissions
RAN API	National Action Plan on Climate Change Adaptation
RAN GRK	National Action Plan on Greenhouse Gas Emissions Reduction
REDD	Reducing Emission from Deforestation and Degradation
Renstra OPD	Strategic Plan for Subnational Organizational Levels
RIE	Regional Implementing Entities
RKA	Work and Budget Plan for Ministries and Institutions
RKPD	Subnational Government Work Plan
RPJMD	Subnational Medium Term Development Plan
RPJPD	Subnational Long Term Development Plan
RTRWK	District/City Spatial Zoning Plan
RTRWP	Province Spatial Zoning Plan
Satker	Work Unit
SCF	Standing Committee on Finance
SDF	Sustainable Development Financing
SIDA	Swedish International Development Agency
SIDIK	Vulnerability Index Data Information System
SIGN	GHG Inventory System
SMI	Sarana Multi Infrastruktur
SMART	Integrated Performance Monitoring System
SPAN	State Treasury and Budget System
SRN	National Registry System
UKCCU	United Kingdom Climate Change Unit
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WB	World Bank

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# Foreword from the Minister of Finance of the Republic of Indonesia



Climate change is a global issue that affects the continuity of ecosystems and human livelihoods. As a tropical archipelago, Indonesia is highly vulnerable to the adverse impacts of climate change. This is evident from the rising number of natural disasters caused by climate change, such as floods and droughts leading to the increased potential for forest fires, the reduction sanitary water, increased prevalence of numerous diseases, decreased agricultural productivity, and damaged the natural resources assets including Indonesia's biodiversities.

Indonesia's commitment in tackling climate change issues is stated in Indonesia's Nationally Determined Contribution (NDC) that sets the greenhouse gas (GHG) emissions reduction targets by 29 percent with national efforts and up to 41 percent with international support, from the Business As Usual (BaU) scenario by 2030. In order to fulfill this commitment, adequate and measured financial support is required. The Climate Budget Tagging policy is one of the government's innovations in order to increase awareness of climate change's effects in Indonesia.

I fully endorse the publication of the Public Climate Finance Book, meant to provide information to the public on the status, progress, and economic analysis of the public financing aspect for climate change in Indonesia. Furthermore, this book can provide an accurate source of data to be developed into further analysis reports beneficial in overcoming the issue of climate change in Indonesia.

With the publishing of this book, I hope that it will further encourage the transparency of climate change fiscal and budgeting framework, in order to enable stakeholders and the general public to obtain comprehensive information from all aspects of the government, to ensure that all parties can utilize the information provided in this report, and that the Indonesian public understands the issue of climate change, as well as the government's role in overcoming its effects. This includes supporting the role and policy of the government in managing an effective, efficient and accountable state budget.

Jakarta, December 2019  
Minister of Finance of the Republic of Indonesia

A handwritten signature in blue ink, which appears to read 'Sri Mulyani'.

Sri Mulyani Indrawati

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# Remarks from Head of the Fiscal Policy Agency



Climate change is a real, tangible issue that needs to be attended to by both the government and Indonesian societies. Through the enactment of Law No.16 Year 2016, the Government of Indonesia has ratified the Paris Agreement as a global commitment on the climate change action. As a contribution on this commitment, Indonesia will conduct an effort to reduce the GHG emissions and increase the resilience to the effects of climate change.

The Ministry of Finance, through the Fiscal Policy Agency, is dedicated in supporting the implementation of climate change mitigation and adaptation activities, through climate change budget tagging mechanism at the national level. Budget tagging is designed to take inventory of the activities, as well as the amount of public funding and its realization that allocated by the government through state budget in reducing GHG emissions and increasing the resilience towards climate change impacts. This mechanism, having been initiated at the national level, is hoped to be beneficial for ministries/institutions in order to project climate change budgets efficiently, effectively, and in line with the principle of Performance Based Budgeting.

The Public Climate Finance 2016-2018, as a document that managed to map the entirety of government funding for climate change. This book comprehensively provides the development of public funding for climate change, as well as results of the analysis on the climate change budget in the 2016-2018 period, which noted the increasing of public budgeting for climate change. The results of Climate Budget Tagging in this period has also been utilized by the Ministry of Finance to develop innovative financing instruments in the form of Green Sukuk, which has been issued twice since 2018 with a total value of USD 2 billion.

In order to support fiscal transparency in Indonesia, this book is to be published regularly. Furthermore, this book is expected to be developed into further studies that would be beneficial for stakeholders and the Indonesian public in general.

The success of the publication of this book cannot be separated from the support of the Minister of Finance of the Republic of Indonesia. I would also like to thank Mr. Suahasil Nazara, Vice Minister of Finance, and the former Head of the Fiscal Policy Agency, for the guidance and direction during the development of the book Public Climate Finance.

My appreciation goes to several key ministries and units under the Ministry of Finance, that contributed in the drafting and implementing of climate budget tagging in Indonesia. I would like to specifically convey my appreciation to the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) for their support to the Ministry of Finance for climate change financing initiatives.

Finally, I would like to congratulate and thank the drafting team from the Center for Climate Finance and Multilateral Policy of the Fiscal Policy Agency, for their dedication in the drafting of this report.

Jakarta, 31 December 2019  
Acting Head of the Fiscal Policy Agency



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## EXECUTIVE SUMMARY

Indonesia can be categorized as being rather vulnerable to the risks posed by the impacts of climate change. Indonesia's vulnerability is reflected through the increase of its rank in the Global Risk Index (GRI) since the last two decades. It is projected that, in 2050, the economic loss that will be inflicted due to climate change amounts up to 1.4 percent of Indonesia's current GDP. In awareness of the increasing threat caused by climate change, the Government of Indonesia conducted the efforts in managing the adverse impacts from climate change. This includes contributing actively in climate change negotiations as well as reaching of agreement on the global level. As one of the countries committed to implement the ratification of the Kyoto Protocol in 2004 as well as the Paris Agreement in 2016, Indonesia demonstrates its commitment through the planned national-level climate change mitigation programme as stated in the National Action Plan on Greenhouse Gas Emissions Reduction (RAN GRK), as a follow-up to President Susilo Bambang Yudhoyono's speech at the G20 Summit in Pittsburgh and the Nationally Determined Contribution (NDC) set in 2016. Indonesia is committed in reducing the level of emission from Business As Usual (BAU) by 26 percent in 2020 and 29 percent by 2030 with national efforts, and 41 percent by 2030 with international supports. In addition to the initiative to reduce GHG emissions, Indonesia also commits to increase its resilience towards climate change, which are set forth in the National Action Plan on Climate Change Adaptation (RAN API) set in 2014.

Attaining the targets for GHG emission reduction requires a huge amount of funds. According to the Second Biennial Update Report (BUR) 2018, Indonesia has delivered the funding needed to achieve the emission reduction targets in 2030 is estimated to be USD\$247.2 billion or IDR3.461 trillion. Therefore, a climate change funding framework is required, particularly in order to ensure adequate funding and achievement of climate change targets.

Climate change funding can be raised from a wide range of sources, including public funds, private funds, and a combination of both. Public funds sourced from the government budget, grants, and foreign loans. The funds sourced internationally can be channeled through the government budgets, private sectors, and NGOs acting as intermediaries. As reported by BKF and CPI (2014), Indonesia's climate change funding is predominantly sourced domestically, i.e. 66 percent sourced from government funds, while 34 percent are received from the international funds. In Indonesia, the Ministry of Finance (MoF) and the Financial Services Authority (OJK) are two agencies that play a key role in climate change funding in Indonesia. The MoF has responsibility in ensuring sufficient funding is available for climate change programmes and activities, and monitor the

outcomes of the programmes. While, the OJK plays a role in facilitating the mobilization of funds from the private sector.

A number of public funding instruments currently exist in Indonesia. The Government of Indonesia manages a climate change fund through the Indonesia Climate Change Trust Fund (ICCTF) under Bappenas and newly formed agency is the Environment Fund Management Agency (BPD LH) under the Ministry of Finance. In addition, the Government of Indonesia has issued Green Sukuk which have been reviewed by the Centre for International Climate and Environmental Research (CICERO) and rated Medium Green.<sup>1</sup> Multilateral funding sources have also been sought such as the Adaptation Fund (AF), the Global Environment Facility (GEF), and the Green Climate Fund (GCF). The Government of Indonesia has also been increasing the participation of non-public funds for climate change, as is shown by the Indonesia's Sustainable Financial Roadmap in 2014 followed up by the passing of Financial Services Authority Regulation (POJK) No. 51 Year 2017 concerning the Application of Sustainable Financing for Financial Services Agencies, Issuers, and Public Companies. Non-public funding has been implemented through the issuance of green bonds by PT Sarana Multi Infrastruktur (PT SMI) and Bank OCBC NISP.

In order to strengthen the transparency of public climate change funding, the Ministry of Finance as a national economic policy regulatory authority has responsibility to ensuring that climate change funding needs are a reflection of budget priorities and allocated effectively and efficiently. Since 2016, the Ministry of Finance initiated a budget tagging implementation for climate change mitigation and adaptation activities. In the beginning of its implementation, budget tagging takes place at output level that was implemented in the Work and Budget Plan for Ministries and Institutions (RKA K/L) through Architecture and Performance Information (ADIK) system and was carried out exclusively for mitigation-related activities. Since 2018, as adaptation budget tagging was initiated and implemented under the KRISNA system that was developed by Bappenas and the composition of the climate change budget could be grouped into mitigation and adaptation. This climate budget tagging is expected to be used as an evaluation for mitigation and adaptation activities by internal line ministries, to improve the Performance-Based Budgeting (PBK), and to be used for references and reporting on the national and international level, as well as the Green Bond/Sukuk.

Indonesia's climate change budget nominally experienced an increase between 2016 and 2018. Indonesia's climate change budget grew by 51.6 percent from IDR72.4 trillion in 2016 to IDR109.7 trillion in 2018. A majority of Indonesia's climate change management budget for 2018 was allocated to mitigation activities (55 percent), followed by adaptation activities (34 percent) while a further 11 percent was set aside for mitigation featuring co-benefit properties in relation to the adaptation budget. Indonesia's climate change budget, be it in the form of mitigation or adaptation, is dominated by the Ministry of Public Works and Housing.

Mitigation activities' realization value has indicated an uptrend value, from IDR52.45 trillion in 2016 to IDR85 trillion in 2017. The Ministry of Agriculture successfully realized

1 According to the CICERO methodology, the grading, dark green, medium green, and light green, is based on a board qualitative assessment of project sectors and on exposure to climate risks. Overall shading is based on the shading of project category and on the governmental structure. More information see <https://www.cicero.oslo.no/en/posts/single/cicero-shades-of-green>



96 percent of its mitigation budget in 2017, and marked itself out as the ministry with the highest realization percentage for its mitigation budget for that year. From a sectoral viewpoint, Indonesia climate change mitigation activities remain concentrated on the energy and transportation sectors. According to budget tagging results, approximately 77 percent of the mitigation budget in 2018 was dominated by energy and transportation-based activities amounting to IDR55.33 trillion. Meanwhile, as much as 98.81 percent of IDR440 billion of the Ministry of Agriculture's budget tagging in 2018 had a direct impact on reduced GHG emissions as the ministry marked itself as having the highest percentage of mitigation budget tagging that resulted in direct impacts compared to other ministries.

The adaptation budget tagging process, which commenced in 2018, was only carried out by eight of 16 ministries and institutions: Ministry of Environment and Forestry, Ministry of Agriculture, Ministry of Energy and Natural Resources, Ministry of Public Works and Housing, Ministry of Marine Affairs and Fisheries, Geospasial Information Aboard (BIG), Technology Assessment and Implementation Agency (BPPT), Meteorology Climatology and Geophysics Agency (BMKG). Resiliency of life and economic systems share top priority in adaptation activities. These two sectors were responsible for over 80 percent of adaptation budget tagging in 2018. Over a half of 2018's adaptation budget was bolstered by the life system resilience sector with the total adaptation budget of IDR27.17 trillion, followed by economic resilience sector with the proportion of 26 percent. The Ministry of Public Works and Housing has the largest budget for adaptation activities which includes four existing sectors, i.e. the economic, life systems, special territories, and supporting systems sectors. Meanwhile, the Ministry of Environment and Forestry has the largest budget in the ecosystem sector.

Although based on the budget tagging results, the portion allocated for climate change appears to be increasing, the value is still far below the required funding. For instance, in the case of mitigation activities, the budget allocation for 2018 is around 25 percent of the BUR's estimated required average mitigation funding.

In order to fulfil the need for annual climate change funding, the government needs to set out strategic steps in order to mobilize additional funds from other potential suitors, such as by stimulating the engagement of private sectors. There needs to be coherence from climate change action plans and development plans that can be sharpened by a public funding framework for climate change control.

This document is one of the forms of the government's accountability and public transparency with regards to climate change management. Hopefully, a constructive public discourse will emerge in order to achieve sustainable development and climate resilience in Indonesia.

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According to the 2019 Global Risk Report published by the World Economic Forum, global environmental risks, including in Indonesia, are increasing both in terms of frequency and adverse impacts. This is indicated by Indonesia's rise in the Global Climate Risk Index. In 2017, Indonesia was globally ranked 50th while in the previous two decades it was on average positioned 69th (Germanwatch, 2019). Indonesia is a country that is vulnerable to ecological disasters brought about by climate change, such as floods, droughts, and rainstorms. An estimate by USAID (2016) indicates that ecological disasters would, in 2050, cause Indonesians an economic loss amounting up to IDR132 trillion or equivalent to 1.4 percent of Indonesia's current GDP (USAID, 2016).

Climate change caused by human productive activities is essentially an externality<sup>2</sup> that impacts the welfare of the communities. Climate change management efforts may reduce potential economic losses arising out of such climate change. In general, climate change management efforts share the characteristic of being a public good<sup>3</sup>, meaning that any benefits derived from such a program would benefit not one but rather multiple parties.

Tied to the provisioning of public goods is the free-rider<sup>4</sup> issue, which forms one of the biggest obstacles to private, profit-oriented parties in initiating the provisioning of public goods as they are disinclined to bear expenses for benefits other parties not paying for the goods they are enjoying nevertheless. Therefore, the role of the government becomes crucial as a provider of public goods, through a series of climate change management policies and programs. Even so, an increasing number of private sectors and other non-public agents are making their contributions to climate change mitigation and adaptation activities, born out of either for-profit<sup>5</sup> or other social motivations.

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2 In economics, a negative externality is a negative impact that's caused by an activity of one economic agent affecting another economic agent in the form of reduced welfare.

3 In economics, public goods share two characteristics: non-excludability and non-rivalry. Non-excludability means that beneficiaries of a climate change management program are not restricted to one individual only, but are inclusive of others as well. While non-rivalry means that benefits received by one individual do not reduce those received by others. For instance, reduced emissions following a switch to renewable energy. The benefits of reduced emissions are enjoyed by the individual and by others in the community, and reach in fact people globally, in the same measure.

4 Free-riders are those that want to enjoy the benefits of public goods without having to contribute anything to the realization of the provisioning of the goods. The motivation to free-ride emerges from the fact that the climate change management effort is not only to be enjoyed by it, but by other individuals as well.

5 A number of climate change management actions, notably mitigation actions, have caught the private sector's attention because of their financial feasibility, e.g. renewable energy generation (power supply enterprises such as hydroelectric and solar power plants). However, in some countries, especially in developing countries, the sector has yet to achieve financial feasibility because of the market's inauspiciousness.

Climate change management programs can overall be grouped into two types: mitigation and adaptation. Mitigation is an effort to reduce GHG emissions in order to reduce the risks posed by climate change impacts, while adaptation is an effort to adapt to changing conditions brought about by climate change. In other words, mitigation focuses on the management of factors causing climate change, while adaptation focuses on the management of impacts arising out of climate change.

In addressing climate change risks, Indonesia has been playing an active role in mitigating (reducing GHG emissions) and adapting to climate change impacts. Mitigation and adaptation activity plans for up to 2020 are set forth in the National Action Plan on Greenhouse Gas Emissions Reduction (RAN GRK) and the National Action Plan on Climate Change Adaptation (RAN API). Under the RAN-GRK, Indonesia is committed to reduce its emission rate by 26 percent by 2020 and up to 41 percent with international supports. Planned activities for after 2020 are set forth in Nationally Determined Contribution (NDC) document, which committed to reach 29 percent emission reductions unconditionally by 2030, and up to 41 percent conditionally by 2030 with international supports. Mitigation activities are carried out through five priority sectors, while adaptation activities are carried out through five priority sectors.

These efforts will be followed through with the government's realization in terms of the earmarking of funds for mitigation and adaptation activities. The earmarking of public funds for mitigation is carried out by six ministries/institutions (M/Is) as mandated in the RAN GRK, while eight out of 16 M/Is carry out the adaptation activities mandated in the RAN API. In order to support the implementation of mitigation and adaptation activities, the Ministry of Finance has developed budget tagging that had been implemented during the budget years 2016-2018. The budget tagging activity experienced an evolution from that of a post-tagging (i.e. tagging after budget approval) mechanism to that of pre-tagging (i.e. tagging during budget planning) mechanism, and has been integrated into the national budgeting planning application system (KRISNA).

Even so, efforts carried out by the government relating to climate change finance needs to be directed towards more comprehensive actions. Beginning with the integration of mitigation and adaptation actions into national and subnational policies and development plans, the dividing of roles between the public and non-public sectors, especially concerning climate change finance, and instruments for the mobilization of public and non-public funds. The designing of a public funds framework for climate change cannot be separated from the development of non-public funds because the lack of non-public funds would be inextricably linked to the funds the government has to bear in climate change management efforts.

This study sets out to provide a picture of the climate finance framework and the government's role in climate change overall, and to inform on the status and progress of public funds for climate change in Indonesia. The study builds on the mitigation budget tagging report for 2016-2017, which has been published previously by the Fiscal Policy Agency (BKF) of Ministry of Finance. It is expected to serve as a basis to the composing of a Climate Change Fiscal Framework (CCFF) for Indonesia in times to come.



Study results will be presented in their entirety over six sections. In the **second section**, the study addresses Indonesia's commitment to climate change management and estimates the funds needed to achieve the commitment. This section addresses the risks and impacts of climate change that Indonesia has experienced, and the government's role in the climate change management effort through mitigation and adaptation activities. This section also addresses the government's role in international summits on global climate change management while also including commitments toward climate change financing.

The **third section** will address climate change financing sources available at the global level, and developments in Indonesia's current climate change financing schemes. This section begins with a portrait of global financing for climate change and how climate finance frameworks in general operate on the global level. Next, the section goes into developments in Indonesia's current climate change management financing, including the actors involved as well as sources of financing from both the public and non-public sectors.

The **fourth section** will discuss the developments in climate budget tagging in terms of policy, procedure, and methodology, as well as the data analysis results for the climate budget tagging of the 2016-2018 period. The overview starts with the climate budget tagging initiative and an explanation about the budget tagging method used, and the optimization of budget tagging results in support of green planning and budgeting. Analysis results for the mitigation and adaptation budget tagging data for the 2016-2018 period evaluates the effectiveness of climate change finance and provides a projection of future demand for climate change finance.

The study will then conclude with the implications of future policies and agendas in actions that need to be accomplished to strengthen Indonesia's climate financing, which pertains to the strengthening of the government's role, the allocation of public funds, and the mobilization of non-public funds. Hard work is required to optimize and improve the effectiveness of public funds, while simultaneously mobilizing non-public funds considering the sizeable funding potential this source has to offer.

The study builds on the results of the 2016-2017 budget tagging report. Results of the study are expected to provide an up-to-date picture of the status and developments in Indonesia's climate change funding, particularly with regard to public funds. A concerted effort will be required in the designing of a climate change finance framework that will serve as the government's work agenda for green planning and budgeting, and in the formulating of regulations that support the mobilization of climate change funds from both the public and non-public sectors.

In the future, this study is expected to be continuously performed and published biannually. This study is hoped to be a reference for the state and condition of public financing in Indonesia.

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# INDONESIA'S COMMITMENT AND FUNDING NEEDS FOR CLIMATE CHANGE

## 2.1. Climate Change Risks and Impacts in Indonesia

Climate change issues have increasingly piqued the global community's interest in recent years. Climate change is brought about by an increase in the concentration of greenhouse gasses (GHGs), such as carbon dioxide, methane, nitrous oxide, and chlorofluorocarbon in the earth's atmosphere, triggering an increase in the average temperature of the earth's surface, known as global warming<sup>6</sup>. According to World Development Indicator data published by the World Bank, most of the earth's carbon dioxide emissions are produced by the burning of fossil fuels in power and heat generation activities (49 percent), transportation activities (20 percent), and industry and construction activities (20 percent).

Climate change will bring about rather grave consequences to impacted regions. According to IPCC (2018), an increase of up to 2°C above the pre-Industrial Revolution temperature would result in an increased risk of floods due to risen sea levels, intensified rainfall, and lowered yields of several agricultural commodities in Southeast Asia<sup>7</sup>. Meanwhile, high risk of freshwater stress, coastal floods, increased number of days with high temperatures, heat stress in cattle, and destruction of coral reefs due to ocean acidification will be widespread in tropical countries and small islands (see Annex 1).

Climate change in Indonesia takes the form of changes in temperature and annual rainfall. Rainfall is projected to change, though this would vary among regions within Indonesia. As published by USAID (2017), rainfall in Indonesia is estimated to increase in intensity (by approximately 2-7 percent) and frequency (3 to 23 percent) by 2050. This would be followed by longer heatwaves, the disappearance of Papuan glaciers, postponement of the monsoon up to 30 days, dry seasons lasting two days longer, and sea levels rising between 150-450 mm by 2056.

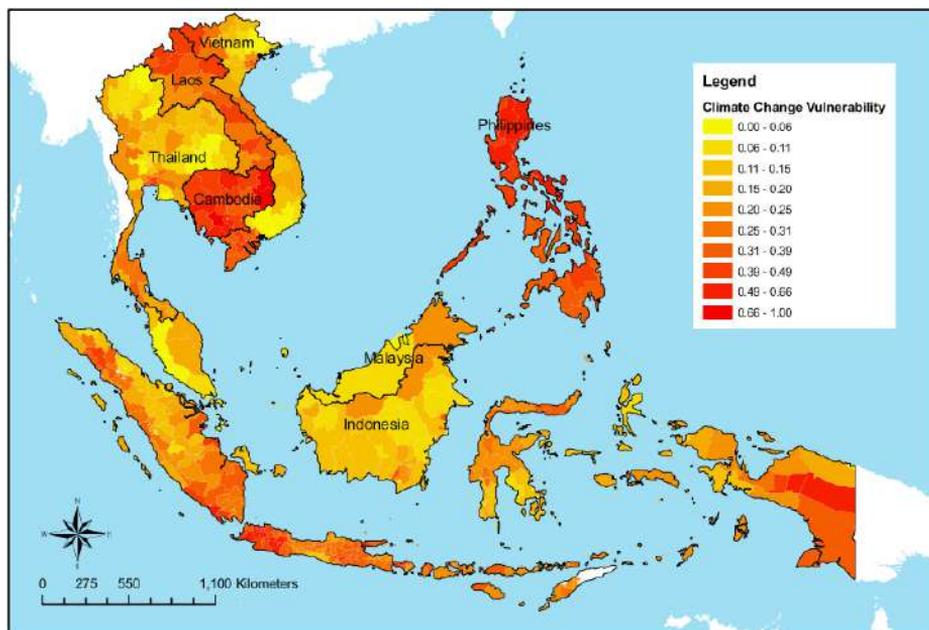
Indonesia, as the world's largest archipelagic country with a coastline of 54,720 km, is categorized as being vulnerable to risks relating to impacts of climate change. According to the climate

<sup>6</sup> The term global warming in this report refers to the increase in the average temperature annually of the earth's sea and land surfaces.

<sup>7</sup> The pre-Industrial Revolution refers to the 51-year period between 1850 and 1900.

change vulnerability index calculated by Yusuf and Francisco (2009), a significant area of Indonesia is highly vulnerable to tropical storms, landslides, floods, droughts, and rising sea levels, as compared to other Southeast Asian countries (see Illustration 1)<sup>8</sup>.

*Illustration 1 Climate Change Vulnerability Map of Indonesia*



Source: Yusuf and Francisco (2009)

North Sumatera's east coast, Lampung's east coast, western Java, eastern Java, West Nusa Tenggara, and Papua Island's eastern part are territories of Indonesia deemed to be highly sensitive to impacts arising out of climate change. Java's vulnerability is perpetuated by the potential risks of floods and landslides and by its high population density, while Papua's vulnerability derives from its low capacity for adaptation and its high exposure to potential risks of landslide disasters. Out of Indonesia's 341 other districts and cities, the Special Capital Region (DKI) of Jakarta is categorized as being the most vulnerable to climate change risks despite its strong adaptive capacity<sup>9</sup>.

Indonesia's significantly rising vulnerability to climate change impacts is also reflected in the Global Climate Risk Index (CRI), especially during the last five years. The CRI indicates quantitative measurements for losses borne by a country

<sup>8</sup> The climate change vulnerability index is a combination of three components: disaster risk mapping (tropical storms, droughts, floods, landslides, and rising sea levels), the capacity for adaptation to climate change, and population density and the presence of regions featuring high biodiversity. What is meant by the index's capacity for adaptation is the ability of infrastructure in an observation region to withstand potential damages that may arise out of a natural disaster.

<sup>9</sup> The top ten districts and cities with the highest vulnerability to climate change impacts, according to Yusuf and Francisco (2009) are: DKI Jakarta, Bandung City, Surabaya City, Bekasi City, Bogor City, Depok City, Palembang City, Tangerang City, Tangerang District, and West Lampung District.

in the wake of extreme weather phenomena. Indonesia was ranked 50th in 2016 with a CRI score of 55.83, far exceeding its rank at 72 in 2012. The increase in CRI rank indicates that in 2017 Indonesia had been exposed to extreme weather events to a significant higher degree than in 2012. This finding is consistent with Indonesia's disaster trends during the period. In 2017, the number of natural disasters in Indonesia (2,372 events) was almost twice that for 2012 (1,811 events). Consequently, the budget the Government of Indonesia had to free up to address natural disaster issues via its National Disaster Management Body (BNPB) during the period reached a significant higher amount. In 2017, BNPB's actual budget was reported to reach IDR 2.668 trillion. This sum is significantly higher than its actual budget of IDR1,342 trillion in 2012.

Bappenas (2014) has compiled climate change risk maps for Indonesia's seven main territories. These reflected the assessment of Yusuf and Francisco (2009) to a high degree: high vulnerabilities to negative consequences of climate change are found in regions with higher population counts and densities. Java, Bali, and Sumatera have high and very high levels of climate change risks if compared to other territories (see Table 1).

The direct impact arising from climate change on human activities bring huge economic costs. According to the Hecht study (2016), the monetary value of economic losses that will be borne by the Indonesia's societies in 2050, as a result of climate change is IDR132.3 trillion or equivalent to IDR408.4 thousand/person. The losses included in the calculations are reduced production of agriculture commodities (rice, soybeans, and sugar cane), reduced production in the aquaculture sector, loss of land for the development of residential and office areas, as well as increased health costs due to widespread epidemic such as dengue fever and malaria.

*Table 1 Levels of Climate Change Risks in Indonesia by Territory*

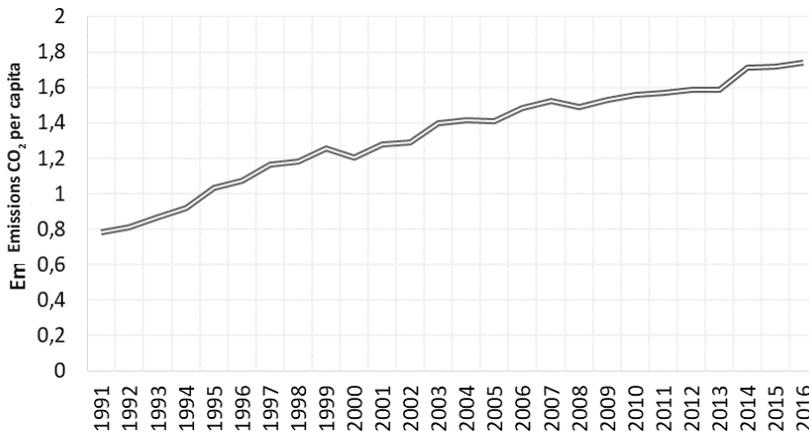
Risk	Sumatera	Java and Bali	Kalimantan/Borneo	Sulawesi	Nusa Tenggara	Maluku	Papua
Water shortages	A, H, VH	H, VH	L, A	H, VH	H, VH	L, A	L
Floods	H, VH	H, VH	L, A, H	L, A, H	L	L	L, A
Drought	H, VH	H, VH	L	L, A	L, A, VH	L	L
Coastal inundation	A, H	A, H, VH	A, H, VH	A, H	A, H	A, H	A, H
Haemorrhagic fever outbreaks	L, A, H	L, A, H	L, A	L, A	L, A	L, A	L, A, H
Malaria outbreaks	L, A	L, A, H	L, A	L, A, H	L, A, H, VH	A, H	A, H, VH
Diarrhea outbreaks	L, A, H	L, A, H	L, A, H	L, A, H	L, A, H	L, A, H	L, A, H, VH
Reduced paddy yields	H, VH	H, VH	-	-	H, VH	-	-
Forest fires	A, H, VH	H, A	-	-	-	-	-

L: low A: average H: high VH: very high

Source: Bappenas (2014)

The rather high vulnerability of most parts of Indonesia to the negative consequences of climate change becomes ever more concerning if the fact is considered that, up to 2016, the country's carbon dioxide emissions per capita has been continuously increasing (Illustration 2). Indonesia is the highest CO<sub>2</sub> emitter among other Southeast Asian countries<sup>10</sup>. For that reason, policies of the Government of Indonesia to reduce emissions will greatly affect the reduction of emissions on both regional and global levels.

*Illustration 2 Indonesia's Carbon Dioxide Emission Trends (CO<sub>2</sub>) per Capita (in tons of CO<sub>2</sub>/person)*



Source: *International Energy Agency* (2018)

The risk of impacts arising out of climate change over both the short and the long terms could threaten economic performances in general and government fiscal stability in particular. Several economic sectors such as extreme weather may disrupt agricultural yields, which could further threaten national food security. Extreme weather could also disrupt tourism, an economic backbone in some of Indonesia's territories. Moreover, the ever-increasing intensity of natural disasters has required the government to set aside a significant sum of contingency funds for disaster management. For that reason, climate change is inextricably linked to government fiscal stability from a revenue point view as a consequence of lowered economic activities, and from an expenditure point view for climate change mitigation and adaptation. This fiscal risk must be addressed by national government and by subnational governments alike.

<sup>10</sup> Indonesia's carbon dioxide emission is higher compared to that of other Southeast Asian countries. Indonesia's total carbon dioxide emissions from fuel burning activities in 2016 reached 454.9 million tons CO<sub>2</sub>e, which exceed that for Thailand (244.6 million tons CO<sub>2</sub>e), Malaysia (216.2 million tons CO<sub>2</sub>e), Vietnam (187.1 million tons CO<sub>2</sub>e), the Philippines (114.8 million tons CO<sub>2</sub>e), Singapore (45.3 million tons CO<sub>2</sub>e), Myanmar (21.1 million tons CO<sub>2</sub>e), Cambodia (9.3 million tons CO<sub>2</sub>e), and Brunei Darussalam (6.3 million tons CO<sub>2</sub>e) (Source: *International Energy Agency* (IEA), 2018)

## 2.2. Government of Indonesia's Efforts on the Climate Change Management

Indonesia has shown a strong commitment to participate in managing climate change impacts at a global level through active participation in a series of climate change negotiations under the United Nations Framework Convention on Climate Change Conference of the Parties (UNFCCC COP). Illustration 3, depicts a list of international UN conferences on climate change that Indonesia has participated in, and the role it had played.

*Illustration 3 Government of Indonesia's contribution under the Climate Change Convention*

<b>UNFCCC COP 3</b> Kyoto, 1997	The Government of Indonesia has officially ratified the Kyoto Protocol through the enactment of the <b>Law No. 17 /2004</b>
<b>UNFCCC COP 13</b> Bali, 2007	Indonesia hosted COP-13 UNFCCC
<b>UNFCCC COP 15</b> Copenhagen, 2009	The Indonesian Delegation successfully put forth the issue of marine affairs in one of the negotiations concerning adaptation
<b>UNFCCC COP 21</b> Paris, 2016	The Government of Indonesia officially ratified the Paris Agreement through enactment of the <b>Law No.16/2016</b>
<b>UNFCCC COP 23</b> Katowice, 2018	The Government of Indonesia responds to approval of the Katowice Package with a plan for NDC renewal and drafts a long-term plan for emissions reduction until 2050.

The scope and commitment of climate change financing globally have been pioneered since the approval of the Copenhagen Accord at the UNFCCC COP 15 in 2009. The Copenhagen Accord mandates a targeted aid for climate change finance by developed countries for developing countries amounting to US\$100 billion a year since 2020. To facilitate transferring of the funds, the Green Climate Fund (GCF) was set up in 2010. In 2014, Indonesia contributed US\$250,000 to the GCF. Currently, the Fiscal Policy Agency, the Ministry of Finance, has been assigned as the National Designated Authority (NDA) representing Indonesia under the GCF<sup>11</sup>. Meanwhile, PT. Sarana Multi Infrastruktur (SMI) is the only entity to have been credited direct access to funding from GCF.

The Government of Indonesia's commitment to international climate change finance has also been demonstrated through the establishment of the Indonesia Climate Change Trust Fund (ICCTF) in 2009. The ICCTF's primary role is to

<sup>11</sup> Indonesia was a GCF board member in 2012-2014, and an alternate board member in 2013-2015.

“The Government of Indonesia is increasing their ambition to reduce GHG emission to 29 percent by 2030, as stated in Indonesia’s NDC document”

collect and coordinate the funding sources needed to finance mitigation and adaptation programs in Indonesia. The ICCTF’s establishment is also expected to be able to strengthen accountability in terms of Indonesia’s climate change finance, reducing time to disburse funds, and to facilitate the engagement of the private sector in climate change management.

Furthermore, climate change management efforts are implemented through mitigation actions to reduce GHG emissions and adaptation actions to strengthen resilience against climate change impacts. The national climate change mitigation program designed by the Government of Indonesia is set forth in the National Action Plan on Reductions in Greenhouse Gas Emissions (RAN GRK). The RAN GRK is a follow through on Indonesia’s commitment to reduce GHG emissions as expressed in President Susilo Bambang Yudhoyono’s speech in the G20 Pittsburgh, United States, on 25 September 2009. The RAN GRK’s legal foundation is Presidential Regulation 61/2011 concerning the National Action Plan on Reductions in GHG Emissions. The primary goal of the RAN GRK is to reduce Indonesia’s GHG emissions by 26 percent in 2020 as compared to BAU<sup>12</sup>. The reduced emission target could be extended up to 41 percent should Indonesia receive sufficient financial support from the international community.

There are five primary sectors have been identified under the RAN GRK, including forestry and peatlands, waste, agriculture, industry, and energy and transportation. Of these five sectors, the forestry and peatlands sector carries the bulk of achieving the reduced emissions target. Emission reductions in the forestry and peatlands sector is expected to reach 0.672 gigatons CO<sub>2</sub>e by 2020 or 0.367 gigatons CO<sub>2</sub>e with financial support from the international community. Implementation of the RAN GRK itself is supported by six key actors: the Ministry of Environment and Forestry; the Ministry of Public Works and Housing; the Ministry of Agriculture; the Ministry of Industry; the Ministry of Transportation; and the Ministry of Energy and Mineral Resources.

*Table 2 GHG Emission Reduction Targets and Implementing Institutions for Indonesia’s Climate Change Mitigation Efforts Under the RAN GRK and NDC Document by Sector*

Sector	GHG Emission Reduction Target							
	RAN-GRK				NDC			
	26% Target		41% Target		Scenario CM1 (29% Target)		Scenario CM2 (41% Target)	
	Millions of tons of CO <sub>2</sub> e	% of BaU	Millions of tons of CO <sub>2</sub> e	% of BaU	Millions of tons of CO <sub>2</sub> e	% of BaU	Millions of tons of CO <sub>2</sub> e	% of BaU
Forestry and Peatlands	672	22.78	1,039	35.83	497	17.2	650	23
Waste Management	48	1.63	78	2.69	11	0.38	26	1
Energy and Transportation	38	1.29	56	1.93	314	11	398	14
Agriculture	8	0.27	11	0.38	9	0.32	4	0.13
Industry	1	0.03	5	0.17	2.75	0.1	3.25	0.11
<b>TOTAL</b>	<b>767</b>	<b>26</b>	<b>1,189</b>	<b>41</b>	<b>834</b>	<b>29</b>	<b>1,081</b>	<b>38</b>

Source: Academic Paper for the 2010-2020 National Action Plan on Reductions in Greenhouse Gas Emissions and the Directorate General of Climate Change, the Ministry of Environment and Forestry (2017)

<sup>12</sup> GHG levels at a business-as-usual baseline planned in the RAN GRK equals 2.95 gigatons of CO<sub>2</sub>e.



Efforts in transitioning towards a future with low emissions and climate resiliency after 2020 are set forth in Indonesia’s Nationally Determined Contribution (NDC) document. The NDC was prepared by Government of Indonesia and submitted to UNFCCC Secretariat in September 2016, as a form of commitment to the Paris Agreement. President Joko Widodo has set a higher GHG emission reduction target for Indonesia for 2030, namely 29 percent (Counter Measure 1 scenario/CM1) by the country’s own efforts and up to 41 percent (Counter Measure 2 scenario/CM2) with international support compared to the business-as-usual (BAU) baseline. The GHG scope as meant in Indonesia’s NDC covers carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O).

The sectors that have been identified as the main focus under the NDC closely reflect those under the RAN GRK: forestry and peatlands, waste, agriculture, industry, and energy and transportation. The forestry and peatlands sector remains the priority sector under the NDC, for which is targeted the largest drop in emission compared to the other four sectors. Meanwhile, GHG reduction in the energy and transportation sector has received more attention under the NDC compared to that under the RAN GRK.

In addition to the national mitigation plan, the Government of Indonesia has prepared a range of climate change adaptation efforts as stated in the National Action Plan on Climate Change Adaptation (RAN API). The RAN API’s main purpose is to operate a sustainable development system and to have strong resiliency towards climate change impacts. Nationally, the RAN-API is a part of the Adaptation Working Group, which forms part of the Coordinating Team for Climate Change Management, established by virtue of Decree of the Minister of National Development Planning/Head of the National Development Planning Agency No. Kep.38/M.PPN/HK/03/2012 concerning Establishment of the Coordinating Team for Climate Change Management.

*Table 3 Key sectors of the RAN API*

Sector	Subsector	Responsible Institutions
Economic security	<input checked="" type="checkbox"/> Food security	Ministry of Agriculture, Ministry of Marine Affairs and Fisheries, Indonesian Institute of Sciences, BPN, Ministry of Environment and Forestry, Ministry of Public Works and Housing, BNPB, Bappenas, BPS, BPPT, Ministry of Energy and Mineral Resources, Ministry of Finance, Ministry of Research and Technology
	<input checked="" type="checkbox"/> Energy resilience	
Livelihood resilience	<input checked="" type="checkbox"/> Health affairs	Ministry of Health, Ministry of Public Works and Housing, Ministry of Home Affairs, BNPB, Coordinating Ministry of People’s Welfare, Ministry of Marine Affairs and Fisheries, Ministry of Transportation, Indonesian Institute of Sciences, Ministry of Energy and Mineral Resources, BPPT, BMKG, Ministry of Environment and Forestry
	<input checked="" type="checkbox"/> Housing	
	<input checked="" type="checkbox"/> Infrastructure	

Sector	Subsector	Responsible Institutions
Ecosystem resilience	<input checked="" type="checkbox"/> Ecosystem and biodiversity	Ministry of Environment and Forestry, BMKG, BPPT, Bappenas, Ministry of Public Works and Housing, Ministry of Marine Affairs and Fisheries, Indonesian Institute of Sciences, BNPB, Ministry of Women Empowerment and Child Protection, Ministry of Home Affairs, Ministry of Agriculture
Resilience of special territories	<input checked="" type="checkbox"/> Urban areas <input checked="" type="checkbox"/> Coastal areas and small islands	Ministry of Public Works and Housing, Ministry of Home Affairs, Bappenas, BNPB, Ministry of Marine Affairs and Fisheries, Ministry of Environment and Forestry, Ministry of Research and Technology, BIG
Supporting systems	<input checked="" type="checkbox"/> Capacity building of stakeholders for climate change adaptation <input checked="" type="checkbox"/> Development of a reliable and up-to-date climate information <input checked="" type="checkbox"/> Strengthened research and development of scientific knowledge and technology relating to climate change adaptation <input checked="" type="checkbox"/> Planning and budgeting capable of responding to climate change <input checked="" type="checkbox"/> Monitoring and evaluation of climate change adaptation activities	BNPB, BMKG, Coordinating Ministry of People's Welfare, Ministry of Foreign Affairs, Indonesian Institute of Sciences, BPPT, Bappenas, Ministry of Law and Human Rights, BIG, Ministry of Environment and Forestry

Source: National Action Plan on Climate Change Adaptation (RAN API), Bappenas (2014)

Strategically, the RAN API is directed towards five key affairs: (i) building economic resilience; (ii) building a (social) life resilient towards climate change impacts (life system resilience); (iii) preserving the sustainability of ecosystem environmental services (ecosystem resilience); (iv) strengthening resilience of special territories in the urban areas, coastal areas, and small islands, (v). building the supporting system.

Action plan policies for climate change management need to be integrated into national development planning at the national and subnational levels. There is a need to clarify distinctions between the roles of the government and the private sector and other public parties in relation to the implementation of a wide range of climate change programs. Action plan for climate change management needs to be supported by other policies, such as sectoral and fiscal policies. Fiscal policies include policies concerning revenue and expenditure. There is a need in the revenue sector to evaluate whether or not the current tax and non-tax scheme is proper and supportive of climate change management. Land and Building Tax, for example, can be used to incorporate externality costs from land use and to reflect the scarcity of land itself. In some countries, property tax also incorporates disaster insurance for property damages incurred by the community/the business sector<sup>13</sup>. On the expenditure side, there is a need to assess the funds needed to carry out climate change management activities assigned to the government, the government's financing potential, and how to bridge existing finance shortages.

<sup>13</sup> The same issues need to be assessed for taxes and non-tax state revenues (PNBP) from extractive industries and industries producing GHGs.

## 2.3. Estimated Climate Finance Needs and Adequacy in Indonesia

The fulfillment of NDC targets require a significant amount of funds. In the 2018 Second Biennial Update Report (BUR), Indonesia stated that the financing required for GHG emission reduction to meet the emissions reduction target for 2030 is estimated to reach US\$247.2 billion, or approximately IDR3.461 trillion.

Table 4 Finance Needs to Achieve NDC Targets by 2030

Sector	Activity	Emissions Reduction Potential	Estimated Cost (in billions of USD)
Forestry and land use	<ul style="list-style-type: none"> <li>Forest conservation and protection programs</li> <li>Forest fire prevention</li> </ul>	655 million tons CO <sub>2</sub>	5.56
Energy and transportation	<ul style="list-style-type: none"> <li>Construction of renewable energy power plants</li> <li>Investments in clean energy</li> </ul>	398 million tons CO <sub>2</sub>	236.2
Industrial Processing and Product Use (IPPU)	Mostly cement and steel industries (80% private investment)	3.25 million tons CO <sub>2</sub>	0.4
Waste	Processing of liquid and solid waste in the industrial and household levels	26 million tons CO <sub>2</sub>	2.9
Agriculture	<ul style="list-style-type: none"> <li>Low emission rice varieties</li> <li>Irrigation efficiency</li> <li>Utilization of biogas</li> <li>Increasing the quality of cattle supplements</li> </ul>	4 million tons CO <sub>2</sub>	2.2
<b>Total</b>			<b>247.3</b>

Source: Indonesia Second Biennial Update Report (BUR), 2018

Notes:

\*) For fulfillment of 2030 targets based on a Business As Usual scenario

\*) Does not include abatement costs per stages of lumber production, and newer technologies that might appear at every stage, and costs for peatland management technology

The greatest funding needs are specifically related to the forestry and energy sectors which are the two main target sectors in the NDC. Funds needed for GHG emission reduction activities in the forestry and land sectors between 2018 and 2030 are estimated to reach IDR77.8 trillion. On the other hand, the estimated need for funds to reduce GHG emissions in the energy and transportation sectors in the period 2018 to 2030 is around IDR3,307.2 trillion.

Previously, various studies have also been conducted to estimate funding needs for climate change mitigation in Indonesia, both studies conducted by internal government and international research institutions. The estimated results of climate change mitigation funding needs in Indonesia vary from one study to another because of differences in calculations. However, the results of the study generally provide an overview of funding needs roughly to achieve targets in Indonesia.

“The largest financing need is specifically affiliated to the energy and forestry sectors, which are the main targets in the NDC. Financing needs for the forestry and land use sector is estimated to reach IDR77.8 trillion and IDR3,307.2 trillion for energy and transportation sector (in the 2018-2030 period).”

*Table 5 Financial Estimates for Indonesia's Climate Change Mitigation Effort from a Variety of Document Sources<sup>14</sup>*

No.	Document Source	Mitigation Financing Needs (US\$)	Average Annual Financing Needs (US\$)
1	NEEDS/DNPI – McKinsey Cost Curve, 2009	385.2 billions (2010-2030)	19.26 billion
2	Bappenas, 2011	28.07 billions (RAN-GRK 2010-2020)	2.8 billion
3	Fiscal Policy Agency (Wahyudi, 2012)	75-90 billions (2010-2020))	7,5-9 billion
4	CPEIR, 2012	70.5 billions (RAN-GRK up to 2020)	7.05 billion
5	Tänzler & Maulidia, 2013	250-550 billion (10 years)	25-55 billion
6	Third National Communication, 2017	81 billions, in which 17 billions (RAN-GRK estimate) is dedicated to mitigation and 64 billions dedicated to adaptation (2015-2020)	16.2 billion
7	Second Biennial Update Report 2018	247.2 billions (2018-2030)	20.6 billion

Source: Fiscal Policy Agency, Ministry of Finance (the data has been collected from various sources)

From the assessments it can be concluded that Indonesia's funding needs for climate change mitigation is significantly large. The estimates differ between different sources, ranging between US\$2.8 billion a year (according to early estimates by Bappenas, 2011) to US\$55 billion a year (as estimated by Tänzler & Maulidia, 2013). If converted to the Indonesia Rupiah<sup>15</sup>, then Indonesia's funding needs are estimated to range between IDR39.2 trillion to IDR770 trillion per year, with a median of approximately IDR404 trillion.

In order for Indonesia to fulfill its commitment to reduce GHG emissions, the funding needs as mentioned above are required, be it in the form of public (government) funding, non-public or private (non-governmental organizations) funding, green bonds, etc.

Since the implementation climate change mitigation budget tagging, the government has been able to monitor the scale of funds allocated towards activities related to climate change mitigation and adaptation. Previously, the National Development Planning Agency (Bappenas) reported that during 2007-2014 period, Indonesia has issued US\$17.48 billion worth of funding for climate change mitigation and adaptation activities and supporting activities. Furthermore, based on climate budget tagging data, the government has allocated a budget of IDR72.4 trillion in 2016 and IDR95.6 trillion in 2017.

In 2018, the government allocated IDR109.7 trillion worth of funding for climate change management activities, in which IDR72.2 trillion are dedicated towards

<sup>14</sup> Various documents that were mentioned in the estimate funding needs for climate change mentioned in the table above, generally are for activities related to climate change mitigation. Estimates for special funding needs for adaptation activities are still very limited. However, there are several studies that have tried to estimate funding needs for all developing countries, ranging from USD4 billion per year (Bapna & McGray, 2008), in total for developing countries

<sup>15</sup> With an assumption that USD 1 = IDR14.000,00,-



mitigation activities and IDR37.5 trillion are dedicated towards adaptation activities. When compared to the estimated annual average funding needs for climate change mentioned in BUR 2018 (which is approximately IDR288.4 trillion per year), then it can be concluded that the size of the allocated climate change budget is still below the estimated funding needs for climate change, approximately 38 percent of the estimated value.

To date, there is no standard method in place for the calculation of current funding and the total funding needs to achieve the NDC's target. Multiple studies performed used their respective methods with limitations. As a result, projections on public financing needs for climate change management has not been properly mad. This is despite the projection being crucial to budget planning and climate funding mobilization. This affects the portion of funds the Indonesian government needs in order to fulfill commitments in the NDC. Furthermore, this can also be used as a baseline in evaluating the efforts of the Indonesian government with regards to public financing for climate change management.

Present estimated disparities between climate change financing needs and funding availability is a main component that underlies the necessity to form a Climate Change Fiscal Framework (CCFF) for Indonesia in the future.

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# FINANCE SOURCES OF CLIMATE CHANGE MANAGEMENT IN INDONESIA

Currently, no mutually agreed definition is in place regarding climate change finance<sup>16</sup>. One reference that could be used is the explanation given by the Standing Committee on Finance (SCF) - UNFCCC, which states that climate change finance sets out to reduce GHG emissions and to reduce vulnerabilities while preserving and upgrading human resilience and ecological systems against climate change's negative impacts (UNFCCC, 2016). Climate change funding can be raised from a wide range of sources, including public funds (from both offshore grants and loans and government funds), private funds, and a combination of the two. Funds sourced internationally can be passed through government budgets, private parties, and CSOs acting as intermediaries. Funds could flow through multiple parties before eventually reaching the beneficiary or being implemented in the form of activities on the ground. Therefore, there is a need to take into account the role that intermediaries play in the flow of climate change financing, sourced either internationally or nationally. This section sets out to illustrate climate finance sources and mechanisms currently existing.

## 3.1. Global Framework for Climate Change Management Finance

In many climate change agreements at the global level, commitments concerning climate change finance becomes one of the significant agreements. In the 1992 UNFCCC conference, developed countries were requested to make available new and additional sources of funding for their developing counterparts. Funding mechanisms that were available varied from grants and soft loans, to bonds and private equities. Funds flow through multilateral channels, be it through the UNFCCC mechanism or otherwise, and through bilateral and regional channels. Countries presently contributing to global climate financing include Australia, Canada, the European Union, France, Great Britain, Germany, Norway, Japan, and the United States. Moreover, at the level of receiving countries, funds from a wide range of international sources are coordinated in a body/unit in order to align the contributors' interests with national priorities. The pooled funds could also be combined with domestic funding sources. The funding available at the global level constitutes one of the public funding sources for receiving

<sup>16</sup> See Clapp (2012) for discussions and considerations regarding definitions for climate change finance.

countries. An illustration of the flows and actors involved in global climate finance can be seen in Architecture of Global Climate Finance<sup>17</sup> (Annex 3).

Funding available at the global level may be sourced domestically (government budgets), from government donors, from national, bilateral and multilateral Development Finance Institutions (DFIs), and from climate funds. Meanwhile, private funding may be sourced from project developers, corporations, households, commercial finance institutions (including banks), investment bodies, and private equities, venture capitals and infrastructure funds. Receiving countries, through either National Executing Agencies or the National Climate Fund<sup>18</sup>, can access international funding either directly or through intermediaries, be it under the UNFCCC scheme or otherwise. According to the 2018 CPI report, the total amount of climate funding disbursed from 2015 to 2016 reached on average US\$463 billion with most of the funds sourced from DFIs.

One of the key factors in the flow of global public funds is the presence of Development Finance Institutions (DFIs). DFIs are financial institutions that provide funding to both the public and private sectors as investments that are supportive to the DFIs' end. Here, the DFI that concerns itself with climate management sets out to support transitional efforts towards a low carbon economy. In general, DFIs are owned or supported by a country's government with capital being primarily sourced from that country's government (national DFIs), and DFIs that are managed by multiple developed countries (multilateral DFIs)<sup>19</sup>.

### **1. Multilateral Development Banks (MDBs)**

MDBs are funding sources capable of providing significant and large-scale support to sustainable development and climate funding instruments in development. Using capital sourced from governments and donors, MDBs serve as intermediaries channeling public funds from developed to developing countries. Examples include the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the Inter-American Development Bank (IADB), and the World Bank. In 2017, MDBs have disbursed a total amount of US\$27.9 billion in funds, equivalent approximately to 79 percent of the total funds for climate change management activities worldwide (World Bank, 2018). Therefore, MDBs currently represent the largest source of funding available for climate change management activities.

### **2. Bilateral/National Development Banks**

Bilateral funds are usually disbursed through financial institutions from donor countries, though operating in the receiving developing countries. These agencies receive their mandate from the governments of the two countries to provide longer term funding for both the public and private sectors, and include

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17 It's an indicative scheme only as in reality the global finance architecture is highly complicated and ever developing.

18 National Executing Agencies can take the form of ministries or state institutions of which activities concern climate management, while National Climate Funds are institutions specially established to manage climate management funds.

19 In this report, the definition for DFIs refers to the Frankfurt School-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, wherein Development Banks are the same as DFIs.



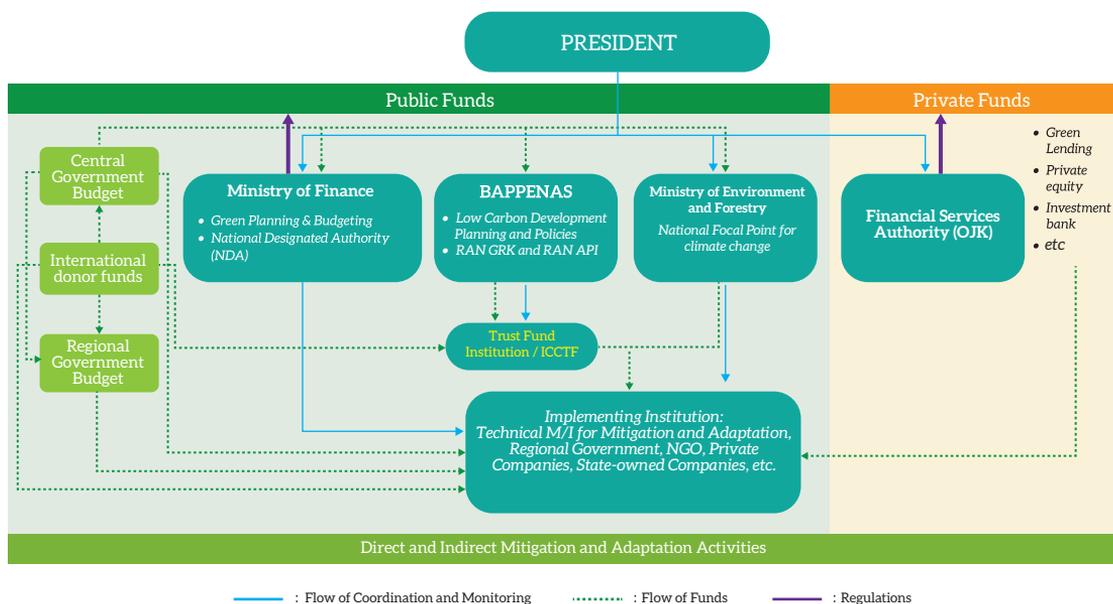
such agencies as Agence Française de Développement (AFD), the Australian Agency for International Development (AusAID), United Kingdom Department for International Development (DFID), Kreditanstalt für Wiederaufbau (KfW), Japan International Cooperation Agency (JICA), Overseas Private Investment Corporation (OPIC), and the United States Agency for International Development (USAID).

In addition to those already mentioned, funding of climate change management activities globally is supported by bilateral and multilateral initiatives/agreements that provide/disburse funding. Bilateral initiatives/agreements include, for example, Japan's Fast Start Finance Fund, USA Global Climate Change Initiative, UK's International Climate Fund, Norway's International Climate Forest Initiative, Germany's International Climate Initiative, and Australia's International Forest Carbon Initiative. Multilateral initiatives include Clean Technology Fund (CTF) and Reducing Emission from Deforestation and Degradation (REDD) Programme. The initiatives disburse funding sourced from multiple sources by mutually agreed upon mechanisms.

### **3.2. Key Actors and Institutions in Indonesia's Climate Change Management Finance**

Multiple parties are engaged in Indonesia's climate change funding, including government sectors but also private and other non-public parties. From the government side, the Ministry of Finance and the Financial Services Authority (OJK) are two agencies that play a key role in climate change funding in Indonesia. Kemenkeu serves as a key actor in public funding while the OJK assists the mobilization of non-public/private funds. Coordinating funding sources and making regulations make up the second most important function of the two institutions. Meanwhile, the Ministry of Environment and Forestry and Bappenas play key roles in the making of policies that deal with climate change management in national development plans while monitoring Indonesia's fulfillment of commitments through climate change management efforts. The relationship among key actors in Indonesia's climate change funding is explained in Illustration 4:

Illustration 4 Coordination and Flow of Funds for Climate Change Mitigation and Adaptation Activities



Source: Fiscal Policy Agency, Ministry of Finance (processed data)

Public and non-public funding can be accessed both directly and indirectly by implementing institutions such as line Ministries/Institutions, Subnational Governments, NGOs, private entities and state-owned enterprises (BUMNs), and National Banks. Funding sourced from international donors can be accessed through both intermediaries and the ICCTF. The following is an explanation of the actors involved in climate change funding and their respective roles:

### 3.2.1. Government

With regard to the government, there are at least three institutions that play key roles in climate change funding in Indonesia:

#### 1. National Government

In Indonesia, three government institutions play key roles in budgeting and coordinating the climate change finance are the Ministry of Finance, the Ministry of Environment and Forestry, and the Ministry of National Development Planning (Ministry of PPN/Bappenas).

##### a. Ministry of Finance

The Ministry of Finance (MoF) is responsible to ensure the availability of funds for climate change management programmes and activities, including for the monitoring of outcomes of the programmes and activities and assessing their effectiveness. It also plays a role in ensuring that climate change management is reflected in budget priorities, pricing policies, and financial market regulations. Some of



the working units under MoF that play key roles include the Fiscal Policy Agency (FPA), the Directorate General of Budget Financing and Risk Management (DJPPR), and the Directorate General of Fiscal Balance (DJPK), Ministry of Finance. The FPA is responsible for designing and regulating fiscal policies that concern climate management funding. It also represents the MoF as the National Designated Authority (NDA) for GCF (Green Climate Funds)<sup>20</sup>. Some of the projects that have been successfully funded by GCF include the World Bank's Geothermal Resource Risk Mitigation Project and the Climate Investor One (CIO) Program.

The DJPPR has been mandated to track existing climate management funds. As part of developing new domestic funding instruments, it also plays a role in issuing Green Bonds and Green Sukuks, which the Kemenkeu launched in 2018. Furthermore, it plays a special role in the development of the Ecological Fiscal Transfer (EFT) instrument in the budget transferring mechanism to subnational regions. Fiscal transferring instruments that can potentially be developed for climate change funding purposes in subnational regions are Special Allocation Funds (DAK), Subnational Incentive Funds (DIDs), and Village Funds. Not only can EFTs be developed to make transfers from the national government to subnational governments, but it can also be utilized to make transfers from province governments to district/city governments.

*b. Ministry of Environment and Forestry*

The Ministry of Environment and Forestry, specifically the Directorate General of Climate Change (DJPPI)<sup>21</sup>, is tasked with formulating and implementing policies in the climate change management sector, focusing on mitigation, adaptation, resources mobilization, GHG inventory, monitoring-reporting-verification (MRV), and forest and land fire management activities. It also coordinates, synergizes, integrates, and provides leadership, including in terms of MRV, at the national (central and subnational) and international levels as the UNFCCC National Focal Point (NFP). In support of these functions, the the Ministry of Environment and Forestry has built a National Registry System (SRN) for climate change to manage and provide web-based data and information of actions and resources (including funding) for climate change mitigation and adaptation in Indonesia.

The Ministry of Environment and Forestry, together with the Ministry of Finance, are have established the Public Services Agency

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<sup>20</sup> Following ratification of the Paris Agreement, Indonesia can make use of its funding mechanism, which include GCFs. Other potential funds include Joint Mitigation Adaptation (JMA) and Loss and Damage, and other technology transfers under the Paris Agreement that could be used in domestic development plans.

<sup>21</sup> In 2008, the government established the DNPI to coordinate the implementation of climate change management and to strengthen the country's standing in international forums with regard to its commitment to climate management. In 2005, DNPI and REDD+ were dissolved and their functions were then merged in the Ditjen PPI KLHK, which now serves as the National Focal Point for climate change.

(BLU) to manage environmental funds called the Environmental Fund Management Agency (BPDLH)<sup>22</sup> as mandated in Government Regulation No. 46 Year 2017 and Presidential Regulation No. 77 Year 2018. The BPDLH is established to manage environmental funds sourced both domestically and from overseas in an optimum, transparent, accountable, effective, and efficient manner.

c. *National Development Planning Agency*

Basically, the National Development Planning Agency (Bappenas) has the authority to design policies that concern climate management over the short, medium, and long terms in national development planning. It then synergizes its climate management policies into the duties and responsibilities of Ministries/Institutions. In accordance with the mandates of RAN GRK and RAN API, it is authorized to coordinate with all institutions at both the national and subnational levels, and to monitor the implementation of activities that are part of the action plans. As part of the climate change funding scope, Bappenas, together with the Ministry of Finance, has the task of mainstreaming climate change policies into the work plans and budgets of Ministries/ Institutions. Moreover, the Indonesia Climate Change Trust Fund has been put under the guidance of Bappenas.

## 2. Subnational Government

In a decentralized system, subnational governments (Pemda) play a key role in the implementation of policies and in both national and subnational planning in the field. As denoted within Presidential Regulation No. 61 Year 2011 concerning RAN-GRK, Province Governments must prepare GHG Subnational Action Plan (RAD) documents that are in step with the RAN GRK, the Subnational Long Term Development Plan (RPJPD), and Province/District and City Spatial Zoning Plans (RTRWP/K), which will then serve as input and a baseline to the drafting of subnational strategic documents and plans, such as the Strategic Plan for Subnational Organizational Levels (Renstra OPD), the Subnational Medium Term Development Plan (RPJMD), the Subnational Government Work Plan (RKPD), and the Subnational Budget (APBD).

In the RAD GRK, Pemda is required to prepare a GHG emission baseline, propose a mitigation action plan and priority scale (including estimates of funding needs), and identify implementing partners and funding sources to support activity/program implementation (Bappenas, 2011). Subnational governments play a role in earmarking the APBD for the implementation of activities focused on the management of key sectors contributing to GHG emissions or sectors that play a role in reducing GHG emissions. They are also authorized to apply policies that deal with subnational revenues (i.e. land permits, taxes and charges, etc.) that support climate change management.

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22 The agency has been established, and is currently structure and program designing phase.



Subnational governments have the authority to implement activities in the field, no matter in provincial or district/city level. Different regional characteristics and issues make each regional government who best understands the issues and challenges faced in the implementation of mitigation and adaptation activities within the regions. Local governments also know the funding mechanism and needs that already exist today, in order to play a role in mobilizing funding from both public and non-public resources.

One form of local government participation that has been carried out in order to mainstream climate change issues in subnational development planning is through green budgeting activities which have begun and have been carried out in several regions including Jambi Province, West Kalimantan Province, and West Kutai District. Progressively, the regions will also carry out climate budget tagging at subnational level. This is done as an effort to encourage increased allocation of public funds for activities that support climate change mitigation and adaptation in the regions.

Subnational governments can identify which financing instruments can be optimized according to the needs and characteristic issues of their respective regions. For instance, several regions can now utilize a number of ecological financial aid schemes<sup>23</sup> in the form of a *Bantuan Keuangan Umum* (BKU - General Financial Aid), *Bantuan Keuangan Khusus* (BKK - Special Financial Aid), and others, given by provincial governments to district/city governments for activities that support the fulfillment of provincial and national strategic programs. Policies implemented by subnational governments have to be in line with the national government. Therefore, coordination and synergy are crucial in order to reach emission reduction targets.

### 3. Indonesia Climate Change Trust Fund (ICCTF)

The ICCTF or the Indonesia Climate Change Trust Fund was designed as an institution that can pool climate change funds internationally and domestically, and to subsequently disburse these for the implementation of policies and program activities in accordance with the RAN and RAD GRK. The ICCTF is operated by a steering committee, namely Bappenas with regard to policy planning and oversight of activity implementation at the national and subnational levels. It's also equipped with a technical committee made up by Bappenas and Kemenkeu representatives to evaluate the environmental feasibility, sustainability, and impacts of the proposed activities that have been proposed to obtain funding assistance. Establishment of the ICCTF is indicative of Indonesia's preparedness to commit to a larger share of responsibility and ownership over climate change programs in Indonesia. Operationally, the decision making

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<sup>23</sup> For example, in the Province of North Kalimantan, in accordance with the Governor Regulation No.6 2019, to provide financial assistance based on ecology, several criteria are used to support and control forest and land fires, provide green open space, manage solid waste, air resources, and connect air pollution.

process in the ICCTF involves multi-stakeholders and encourages collaboration between donors and key stakeholders to the climate change activity. As it progressed, the ICCTF has taken the form of a working unit (satker) under Bappenas. As a consequence, the institution may not directly assist Ministries/Institutions and subnational governments, though it is able to directly finance subnational proponents<sup>24</sup>.

### 3.2.2. Financial Services Sector

The financial services sector is key to mobilizing funding from the private sector. As a regulator of financial services institutions (LJKs), the OJK plays a role in providing guidelines, directions, and incentives for LJKs in disbursing their funds. The following are the roles of key institutions in the financial services sector:

#### 1. Financial Services Authority (OJK)

The Sustainable Financial Program is a government's effort, through the OJK, to encourage financial services institutions to contribute towards sustainable development and reducing carbon emissions in Indonesia. This started with the rolling out of the Sustainable Financial Roadmap in 2014, which was followed up with the passing of Financial Services Authority (POJK) Regulation No. 51 Year 2017 concerning Sustainable Finance. The regulation serves as an umbrella for all financial services sectors, which will be followed up by more detailed and specific regulations to address the various financial services institutions (banks, capital markets, insurance, etc.).

The program is implemented with the collaboration of multiple parties to ensure financing support is secured from financial services that implement sustainable financial principles, including the mobilization of climate friendly investments and the green sector, such as sustainable agriculture and fisheries, renewable energy, green infrastructure and constructions, etc.

#### 2. Financial Services Agencies (LJKs)

Sustainable Financial Policies initiated by the OJK set out to reduce the risks faced by financial services agencies in general by considering more deeply and more broadly the environmental and social aspects and impacts of the activities they finance. The policies also set out to ensure that financial services agencies play a more active role in financing green activities/efforts, as will be reflected in their financing portfolios.

Considering that a majority of the financing comes from the banking sector, at the initial stages the OJK directs its policy implementation at this sector to later on include non-bank financial services agencies as well. Specifically, the OJK passes regulations to encourage banks

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<sup>24</sup> See <https://www.bappenas.go.id/id/berita-dan-siaran-pers/icctf-berhasil-turunkan-emisi-grk-95-juta-tonco2-ekuivalen-atau-1-persen-target-2020/>



strengthen their social and environmental risks management, and to prepare sustainability reports.

Since 2015, eight national banks have become part of the First Movers of Sustainable Financing: Bank Mandiri, Bank Rakyat Indonesia (BRI), Bank Negara Indonesia (BNI), Bank Central Asia (BCA), Bank Muamalat, Bank Rakyat Indonesia Syariah (BRIS), Bank Artha Graha, and Bank Jabar Banten (BJB). This is part of the Indonesia Sustainable Finance Initiative with first movers being given assistance to implement environmental and social risks management, and to make a concerted effort towards strengthening investment in the green sector.

### 3.2.3. Private Sector and Other Actors

Several private companies, state-owned enterprises, and public-private partnership institutions are also involved in climate change related activities. The private sector's role is evident from the renewable energy enterprise sector, notably geothermal energy, hydro power plants, and solar power plants. In this event, the State Electricity Company (PLN) also plays an active role in encouraging the private sector to play a role in the renewable energy business. In 2017, approximately 70 PPAs (Power Purchase Agreements) were signed in order to encourage the development of power generated from clean energy. The development of this renewable energy project will require significant financial funding in order to ensure business continuity.

Other actors working to address climate change issues are non-profit institutions, NGOs, research centers, and consultancies. There are numbers of non-profit institutions and NGOs, both national and international, that work to address climate change issues in Indonesia. The activities they engage in and the influence they exercise on national policies vary, ranging from research and consulting, education and public consultation, government activity/program monitoring, project implementation in the field, etc. Their activities are generally project-driven and focus usually on specific issues, such as land use and land use change, renewable energy, sustainable agriculture, climate funding, etc.

## 3.3. Public Finance for Climate Change

Public financing for climate change activities has both domestic and overseas sources. Domestic public funding can be sourced from and disbursed through government budgets and the National Climate Funds (NCF)<sup>25</sup>. Meanwhile, overseas funding can be disbursed through executing agencies comprising of Government Ministries and Institutions (M/Is), international development institutions/ partners, Subnational Governments (Pemda), and the National Climate Funds. Funding

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<sup>25</sup> The NCF is a financial management mechanism formed to support climate change management activities and programs. Its main purpose includes the pooling, blending, coordinating, and reinforcing of national roles and ownership in climate change finance (UNDP, 2011). Some countries that have NCFs in place include Indonesia (ICCTF), Thailand, China, Bangladesh, and Cambodia.

sourced domestically is made available through multiple instruments, such as budget transfers (between M/Is or between the National Government and Pemda), capital participation for BUMNs, and investment (revolving funds). Meanwhile, overseas funding can take the form of grants and loans.

The funds are then disbursed and used by the implementing agencies to implement programs/ activities related to climate change mitigation and adaptation. Implementing agencies consists of M/Is, regional governments, BUMNs, non-governmental organizations and agencies, and private parties engaged in activities related to climate change mitigation and adaptation. Implementing agencies use the funds to finance activities that contribute **directly** to emission reduction and climate resilience, or **indirectly** in the form of support for capacity building, such as policy development, research and assessments, development of monitoring and evaluation systems, reporting and verification systems, etc.

As reported by BKF and CPI (2014), Indonesia's climate change funding is predominantly sourced domestically, i.e. 66 percent come from government funds, while 34 percent are received from the international public funds. In Indonesia, 86 percent of international public funds flows directly into the financing of mitigation and adaptation projects via either state-owned enterprises (BUMN) or the private sector (in the form of loans), while the remainder is used to support indirect activities such as policy development etc., channeled through national and subnational government. Domestic funds have primarily been used to finance indirect mitigation and adaptation activities, with funds being sourced from the state budget (APBN) through disbursements made by the national government (M/Is) and instruments to make transfers to subnational regions, revolving funds' investments, and paid-up BUMN capital.

As a form of concrete commitment to the climate change management effort, the Government of Indonesia continues to strive to develop funding instruments to finance climate change mitigation and adaptation activities. Climate finance instruments cover public and non-public funds sourced both domestically and internationally. Public funding sourced domestically mainly originates from APBN allocations. Funding instruments could be generated from tax revenues, non-tax state revenues (PNBPs), grants, sovereign Sukuk<sup>26</sup>, Public Services Agency (BLU) grants, and other lawful revenues. The funds are then allocated to line M/Is and through the expenditure of M/I they are disbursed to direct and indirect mitigation and adaptation activities. Currently, six M/Is are involved in mitigation activities and sixteen M/Is are involved in adaptation activities based on the mandates of RAN GRK and RAN API. In 2018, the government budgeted IDR72.2 trillion to M/Is engaged in mitigation activities and IDR37.5 trillion to M/Is engaged in adaptation activities. The largest source for the funding was generated from state budget counterpart funds while the smallest sum was generated from overseas grants (BKF, 2018). Amounts earmarked for mitigation and adaptation can be identified as of the time M/Is conduct budget tagging for mitigation and adaptation activities.

At the subnational level, funding can be sourced from Locally Generated Revenue

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26 Indonesia has issued Green Sukuk bonds as a climate change funding source.



(PAD), subnational transferring mechanisms, and other lawful revenues. Subnational transferring mechanisms include fiscal balance funds (DAU, DBH, DAK), Subnational Incentive Funds, Special Autonomy Funds, and Village Funds. Mechanisms called Ecological Fiscal Transfers (EFT)<sup>27</sup> are being designed to allow for disbursements being made from Province Governments to District/ City Governments. A number of Province level subnational regions have implemented budget tagging, notably for mitigation activities. Future challenges would be to generate uniform mechanisms and standards for budget tagging at the national and subnational levels.

“As an effort to increase transparency of climate change funding in Indonesia, in 2016, the Government of Indonesia through the Ministry of Finance was initiated the climate budget tagging.”

Domestic funding for climate change sourced from the state budget is allocated for two activities: core/ direct activities and supporting/indirect activities<sup>28</sup>. Based on the budget tagging exercise it was concluded that most of M/Is activities were allocated to “supporting activities”, such as policy development, research and development activities, development of measuring systems/ mechanisms, reporting and verification, and the preparation of other supporting environments. These supporting activities contribute to preparing a foundation for the implementation of “core activities” in the mitigation sector<sup>29</sup>.

Some of Indonesia’s public funding sources and instruments are as follow:

#### **Indonesia Climate Change Trust Fund (ICCTF)**

The Indonesia Climate Change Trust Fund (ICCTF) is managed directly by the Government of Indonesia. ICCTF has already gone through two phases of institutional development, firstly the preparatory phase (PREP-ICCTF) from 2010 through 2014 with UNDP as interim trustee, followed by phase two which began in 2015, where ICCTF is a Nationally Managed Trust Fund in the form of a work unit under Bappenas. During the first phase, ICCTF utilized funds from UNDP, while during the second phase ICCTF’s financing was provided through the State Budget (ICCTF, 2018).

When first launched in 2009, ICCTF was intended to coordinate and harmonize climate financing through the management of funds using two mechanisms, namely an *innovation fund* and *transformation fund* (Bappenas, 2009). In the initial phase (innovation fund), the funding received by ICCTF from its development partner and other contributors had been used to finance investment activities that did not yet yield any return. The management of funds is expected to later develop into a transformation fund that will help to penetrate the market and will

27 The Kemenkeu is proclaiming EFTs for implementation in the subnational regions, offering multiple options of formulation.

28 Categorizing budgets into core/ direct and supporting/ indirect activities is hard to do as they have yet to be integrated into budget information systems, and must therefore be produced manually by each respective M/I.

29 Supporting activities outmeasuring core activities need not always be seen as undesirous. There is a need to conduct an overall evaluation of the activity characteristics of the related M/Is, seeing that they play a key role in these supporting activities, which are difficult to carry out by non-governmental agents.

manage revolving investment funds that can produce income. The source of ICCTF funding should develop from being a government funding towards private or non-public funding which is more independent. In order to support this, Bank Mandiri was appointed as fund manager to direct the development towards becoming a transformation fund that yields income.

However, in its actual development, the managing of ICCTF funds tends to remain in the form of an innovation fund. Capitalization of these funds managed by ICCTF is relatively small when compared to other international financing institutions in Indonesia, and ICCTF does not have the tendency to draw additional support from other sources. (Halimanjaya & Maulidia, 2014). One reason for this is that the sector handled by ICCTF is mostly the forestry and land sector. In addition, the transformation of the ICCTF into an independent work unit under the supervision of Bappenas has affected the authority of the trust fund, making it relatively more limited. Such conditions resulted in the reduction of the ICCTF's crucial role in the efforts of mitigation and adaptation to climate change in Indonesia.

During the beginning of its establishment, from 2010 to 2011, ICCTF channeled as much as US\$5.52 million received from the United Kingdom Climate Change Unit (UKCCU), AusAID, and Swedish International Development Agency (SIDA). From this amount, US\$4.59 million (US\$2.3 million in 2010 and US\$2.36 million in 2011) was used for activities that supported the initiatives for climate change that were prioritized by the government, such as mitigation based on land, energy, vulnerability and adaptation (ICCTF, 2012). In line with its development, during the year 2017, ICCTF was able to channel funds amounting to IDR58.3 billion provided by the State Budget, the Danish Development Agency (DANIDA), USAID, AND UKCCU. The funds were used for land-based mitigation activities (Rp. 15.98 billion), adaptation and resilience (IDR4.74 billion), forests and peatland (IDR11.96 billion), prevention of fires (IDR6.16 billion), and others for internal management (ICCTF, 2018).

#### **Environmental Fund Management Agency (BPD LH)**

The Government has established an Environmental Fund Management Agency (BPD LH) with the objectives of mobilizing environmental funds coming from both domestic and foreign sources optimally, applying management that is both transparent and accountable, with effective and efficient channeling of the funds. In order to be able to achieve these objectives, BPD LH is designed with four main policies:

1. *Policy for Organizational Development*  
Organizational structuring, improving the competence of human resources based on performance and building an operational system based on technology and information.
2. *Policy for Collecting Environmental Funds*  
Collecting funds from domestic and foreign sources which may be in the form of a grant, financing, capital participation, as well as loans, and the income obtained from the trade of carbon in the regional market, bilateral and international markets.



3. *Policy for Increasing the Environmental Funds*  
The utilization of idle funds in investment instruments that are liquid and have the potential to provide a relatively high yield but always with measured consideration to the risks involved.
4. *Policy for Channeling Environmental Funds*  
Recovery of the environment, mitigation of pollution and/or damage and recovery of the environment, and conservation of the natural resources. The above activities shall be carried out with accountability and openness in terms of collecting money for the cost and channeling this money.

### **Green Bonds and Green Sukuk of the Government of Indonesia**

In support of its commitment to the policy of low carbon and climate resilience, the Government of Indonesia has also developed a Green Bond and Green Sukuk Framework, which was reviewed by the Centre for International Climate and Environmental Research (CICERO) and received the rating of Medium Green. This working framework serves as a guideline for financing through green bonds and green sukuk in feasible green projects, such as projects that support the transition towards economic growth characterized by low carbon and climate resilience. This includes activities such as climate mitigation, adaptation, and biological diversity in accordance with the criteria and processes as determined in the framework.

Any green project that is included in one of the nine sectors required in the Green Framework of the Republic of Indonesia will be reviewed by the Ministry of Finance and Bappenas. The project that is chosen will receive allocation of funds regulated by the Ministry of Finance. The relevant M/I will have the task of tracking, monitoring, and reporting to the Ministry of Finance any impact to the environment caused by the green project that they are financing.

In March 2018, Indonesia issued global green sukuk worth US\$1.25 billion (IDR16.75 trillion) with tenure of five years, recorded as the first in the world. Out of the total funds collected, 51 percent was used to re-finance green projects from 2016 and 49 percent was used for financing green projects in 2018<sup>30</sup>. Furthermore, such financing covers five out of the nine sectors in the Green Framework, namely the renewable energy sector, and resilience to the climate which is in the category “dark green”, and the sustainable transportation sector, waste management and waste energy, and sustainable agriculture which is in the category Medium Green. In 2019, Indonesia has issued global green sukuk worth US\$750 million (IDR11.25 trillion). Out of the total funds collected, 51 percent was used to re-finance green projects from 2017 and 49 percent was used for financing green projects in 2019.

### **Adaptation Fund (AF)**

AF is one of the multilateral funding sources which focuses on activities for adaptation to climate change. AF funding is sourced from 2 percent of the carbon transactions from the Clean Development Mechanism (CDM)<sup>31</sup>. CDM itself is a mechanism to reduce GHG emissions by developed countries under the Kyoto Protocol. CDM enables emission reduction projects in developing countries to

30 Ministry of Finance of RI - Green Bonds and Green Sukuk of the Republic of Indonesia

31 Adaptation Fund <https://www.adaptation-fund.org/>

gain the status of “Certified Emission Reduction (CER)” which can be traded and used by the industrial countries to fulfill part of their target to reduce emission under the Kyoto Protocol. CDM also assists the developing countries in sustainable development and contributes to reducing the pace of climate change, and also enables the transfer of technology, as well as capacity building and the increase of quality and competitiveness. Funding from AF can be accessed by accredited Implementing Entities, that can be divided into three categories, they are:

- a. National Implementing Entities (NIE)
- b. Regional Implementing Entities (RIE)
- c. Multilateral Implementing Entities (MIE)

In Indonesia, there is one national institution that is accredited as an NIE, namely “Kemitraan Indonesia”. Kemitraan Indonesia has designed an umbrella program and made an open call for proposal, which enables other institutions to access funds for their program initiatives. In synergizing the programs that are submitted with a plan at the national level, each country has its own national authority or known as the Designated National Authority (NDA) which is the main contact for the program funded by AF. In Indonesia, the NDA for AF is the Directorate General for Climate Change in the Ministry of Environment and Forestry. The task of an NDA is to give approval regarding the accreditation of an NIE application before it is sent to the AF Secretariat to be appraised and/or to be approved by the Implementing Entity for the adaptation project and program in that country.

In the 2000-2016 period, the total AF funds that entered Indonesia was US\$138 million, from 47 donors and funding partners. Whereas in 2016 itself, the amount of AF funds for Indonesia was US\$4.77 million, from 18 donors and funding partners that were still active in that year. The funds obtained in 2016 were distributed to 17 projects dealing in democratic and fair governance, sustainable development, and center of learning sources (Kemitraan, 2017).

### **Global Environment Facility (GEF)**

GEF is a mechanism for multilateral funding which is incremental (additional financing), and is expected to become a catalyst to speed up existing programs so that they will be able to provide benefits for global environment management (global environment benefit)<sup>32</sup>. In general, the GEF provides funding for activities such as investment and technical assistance to encourage conditions that will be conducive for increasing the global environmental benefits.

GEF funding for climate change mitigation issues are contained in the GEF-6 Climate Change Mitigation Strategy, which aims to support developing countries so they can make the transition to achieve low emission development and have climate resilience. In general, the funding of mitigation is directed towards activities that promote innovation, transfer of technology, and the drafting of supportive policies and strategies; development of mitigation options that will have a broad impact on the environment; and increasing the people’s concern regarding mitigation issues in order to support sustainable development.

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32 GEF Programming Strategy on Mitigation to Climate Change



Whereas the GEF funding for adaptation activities is contained in the GEF-6 Climate Change Adaptation Strategy, which aims to strengthen the resilience against climate change impacts in the developing countries through short-term and long-term adaptation measures in the affected sector, region, and communities. In general, adaptation funds are directed towards activities that will reduce the community's vulnerability, protect their livelihoods, physical assets, and environment from the negative impact of climate change; strengthen the institutional and technical capacity to effectively adapt to climate change; and integrate the adaptation to climate change into policies, plans, and activities related to climate change.

The availability of GEF funds depends on the process of obtaining the funds, known as GEF Replenishment, which is the process of providing donor commitment to the GEF Trust Fund every four years. GEF has already entered its sixth phase (GEF-6) which began on 1 July 2014 until 30 June 2018 with funds amounting to US\$4.43 billion. During the GEF-6, there were 12 projects approved with Indonesia as part of the recipient country. In the GEF-6 Indonesia received an allocation of US\$83.92 million with the following details:

- a. US\$21.91 million with the focus on climate change.
- b. US\$57.84 million with the focus on biological diversity.
- c. US\$4.16 million with the focus on land damage,

The requirements and conditions for a project to be funded by GEF are, among others, compliance with the national policies, appropriateness for the GEF Focal Area Strategies, consistent with international conventions, and approved by the GEF Operational Focal Point (OFP). In implementation at the national level GEF is coordinated by GEF OFP and GEF Political Focal Point (GEF PFP) for Indonesia, namely an officer from the Ministry of Environment and Forestry and an official from the Indonesian Embassy in Washington DC, USA.

### **Green Climate Fund (GCF)**

GCF is one of the climate funding institutions with the highest commitment value, and is assigned to distribute funds for projects, programs, policies, and various activities related to the efforts of mitigation and other climate adaptations in developing countries<sup>33</sup>. GCF funding is allocated in a balanced manner for mitigation and adaptation activities and the scope of activities is divided into two categories:

1. A shift towards low emission sustainable development through access to energy with low emission and electric power generators; low emission transport; energy-saving buildings, cities, and industries; as well as the sustainable utilization of land and good forest management.
2. Encouragement of sustainable development that is climate resilient by strengthening the people's livelihoods that are vulnerable to the effects of climate change; improving the health and welfare of the people and availability of food and water; building infrastructures and creating an environment resilient to the impact of climate change; and an ecosystem that is also resilient to the impact of climate change.

<sup>33</sup> Green Climate Fund (GCF) <https://www.greenclimate.fund/>

GCF opens direct access through any NIE that has been accredited by GCF. PT SMI is one such NIE that has already received accreditation in Indonesia. Furthermore, the recipient country also has the right to determine the direction, vision, and mission of the program to be implemented in accordance with the interests and needs of the country concerned. The NDA represents the state and will determine which program(s) should operate in Indonesia and acts as liaison between the party proposing the program and GCF. In Indonesia, it is the Fiscal Policy Agency (BKF) of the Ministry of Finance that holds the role of NDA.

Among the projects funded by GCF are “Indonesia Geothermal Resource Risk Mitigation Project (IGRRMP)” and “Climate Investor One (CIO).” IGRRMP involves investment funds reaching the amount of US\$410 million that will be implemented over a period of 10 years and is expected to reduce emission by 112.2 million tons of CO<sub>2</sub><sup>34</sup>. The second project is by CIO, which implements a mitigation project in 11 countries in Africa and the Asia Pacific region, one of them being Indonesia. CIO involves an investment of US\$821.5 billion dollars, with an implementation period of 20 years and is estimated to reduce emission by 53.7 million tons CO<sub>2</sub><sup>35</sup>.

According to the UU No. 17 Year 2009, funds that are provided by international donors must be recorded in the state budget. These funds can then be channeled and managed through the government’s budget (*on-budget, on-treasury*), such as the Climate Change Program Loan (CCPL) from World Bank and ICCTF (Halimanjaya and Maulidya, 2014), or they can be recorded in the state budget but channeled directly by the donor agency or its agent (*on-budget, off-treasury*). Generally, the mechanism for direct distribution by the donor agency or its agent is used by bilateral donors who also give their support to technical assistance programs such as AUSAID, USAID, UNDP, and others. In addition to these two mechanisms, several programs are not recorded in the State Budget and are implemented through a mechanism outside the State Budget (*off-budget, off-treasury*).

Coordination of international funds is a special challenge in itself. The complexity of the procedures of recording, differences in the recording system, and differences in the budget cycle between the donor and the recipient are the challenges that must be faced. However, this track record is essential in order to have accurate information regarding the total flow of climate change funding that enters Indonesia.

### 3.4. Non-Public Funding for Climate Change

Increasing the non-public role in the provision of funds for climate change was encouraged by issuing a Roadmap for Sustainable Finance in Indonesia in 2014, followed by a Financial Services Authority Regulation (POJK) No. 51 Year 2017 on the Application of Sustainable Finances for Finance Service Institution, Issuers, and Public Companies. Included in the roadmap are green bond instruments whose issuance is regulated by POJK No. 60 Year 2017 on the Issuance and Terms for Green Bonds. Based on this regulation, the issuance of green bonds can only

34 GCF – Project FP083 Indonesia Geothermal Resource Risk Mitigation Project

35 GCF – Project FP099 Climate Investor One



be done for the financing of Environmentally Sound Business Activities (KUBL), namely activities that are intended to protect, restore, and/or improve the quality or function of the environment. Activities included in the KUBL are engaged in several sectors, as given below:

1. Renewable energy
2. Energy efficiency
3. Prevention and control of pollution
4. Management of the biological resources and sustainable land use
5. Conservation of biodiversity on land and in the water
6. Environment-friendly transportation
7. Sustainable water management and waste water management
8. Adaptation to the climate change
9. Products that can reduce the use of resources and which produce less pollution (eco-efficient)
10. Environmentally-sound buildings that meet the standards or certification that are recognized nationally, regionally, or internationally.
11. Other environmentally-sound business activities and/or other activity

Furthermore, the companies that issue green bonds are required to obtain the opinion or assessment of an environmental expert stating that the business activity and/or other activity which forms the basis for issuing the green bonds will be beneficial for the environment.

Currently the funding for climate change through green bonds also includes non-public funding, among others the green bonds issued by PT Sarana Multi Infrastructure (PT SMI) and Bank OCBC NISP.

#### **Green Bonds of PT. SMI**

PT. SMI is a company financing the infrastructures of the Government of Indonesia through the Ministry of Finance, which participates in the non-public funding for climate change. This is done by issuing green bonds based on the Green Bond Framework (GBF) and the Environmental and Social Safeguard (ESS) and is in line with the Environmental and Social Management Framework (ESMF) and Environmental and Social Management System (ESMS).

During phase I in 2018, PT SMI issued and offered Sustainable Environmentally-sound Infrastructure Bonds (Green Bonds) with initial value of at most IDR1 trillion<sup>36</sup>. These green bonds consist of two series, namely Series A for a period of three years and Series B for a period of five years. The bonds received a rating of Triple A from the Credit Rating Agency in Indonesia (Pefindo). The funds gained from the green bonds will be used for environment-friendly projects that meet the requirements of an “eligible project” in the following sectors:

1. Renewable energy
2. Energy efficiency
3. Sustainable management and prevention of pollution
4. Management of natural resources and sustainable land use

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<sup>36</sup> Prospect of PT Sarana Multi Infrastructure, Public Offering of Sustainable Environmentally-Sound Infrastructure Bonds (Green Bonds), Phase I of 2018

5. Environment-friendly transportation
6. Water management and waste management

All projects related to these green bonds will then be filtered in accordance with the Environmental and Social Management System (ESMS) of PT SMI.

#### **Green Bonds of Bank OCBC NISP**

Non-public funding for climate change was also done by private banks, such as Bank OCBC NISP. For the initial issue of its green bonds, PT Bank OCBC NISP cooperated with the International Finance Corporation (IFC), a member of the World Bank Group, as the sole investor (IFC, 2018). In this cooperation, IFC gave its commitment of US\$150 million in the form of the said green bonds<sup>37</sup>. The money gained from the bonds will be used to finance environmentally-sound projects and during the initial phase in particular will be used in financing for the debtors engaged in the field of water management.

Bank OCBC NISP also issued Sustainable Bonds III Phase I of 2018 with a fixed interest rate. The initial value of the bonds was IDR1 trillion and consists of three series, namely Series A with a total of IDR655 billion and period of 370 days and interest of 6.75 percent per year, Series B with a total of IDR3 billion and period of two years and interest of 7.25 percent per year, and Series C with a total of IDR342 billion and period of three years and interest rate at 7.75 percent per year. For the three series of bonds, the interest on the bonds is a fixed rate and will be paid every three months as of the date of issuance. In issuing the Sustainable Bonds, Bank OCBC NISP was supported by PT Indo Premier Sekuritas, PT BNI Sekuritas, PT OCBC Sekuritas Indonesia, PT RHB Sekuritas Indonesia and PT Trimegah Sekuritas Indonesia Tbk as the Guarantor for Issuance of Bonds.

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<sup>37</sup> Press Release of Bank OCBC NISP - Investment of IFC to Bank OCBC NISP as pioneer of Green Bonds

## ANALYSIS OF PUBLIC FUNDING FOR CLIMATE CHANGE IN INDONESIA

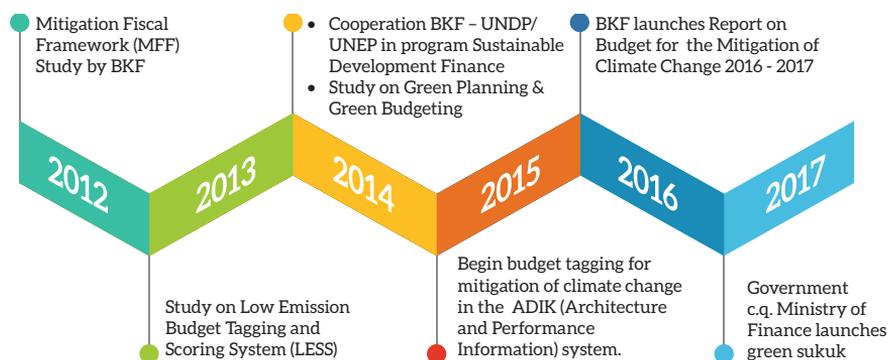
The Ministry of Finance, responsible for managing the national budget, has attempted to make sure that the need for climate change management funding is a reflection of the budget's priority and is allocated effectively and efficiently. In order to be able to support this, the budget is marked to identify which budget items are related to mitigation and adaptation activities. The Climate Budget Tagging was initiated by the Ministry of Finance with the aim of strengthening Indonesia's fiscal framework in the context of implementing the policies concerned with the environment and climate change. This section will analyze the public funding for climate change which is 'on budget' and obtained from the State Budget. Data on the value of funding will be exposed in this section based on the results of tagging the budget items related to mitigation and adaptation to climate change, an activity that began since the budget year 2016.

### 4.1. Climate Budget Tagging Initiatives

“As an effort to increase transparency of climate change funding in Indonesia, in 2016, the Government of Indonesia through the Ministry of Finance was initiated the climate budget tagging.”

In the context of improving the transparency of climate change funding, the Ministry of Finance as the authority for regulating policies on the national budget, is responsible for ensuring that the need for climate change funding is a reflection of budget priorities and is allocated effectively and efficiently. Since 2012, the Ministry of Finance has actively conducted several studies on the policies that support climate change funding and made this the basis for the tagging of budget items for mitigation and adaptation to climate change.

### Illustration 5 Initiation by Ministry of Finance in Supporting Climate Change Funding

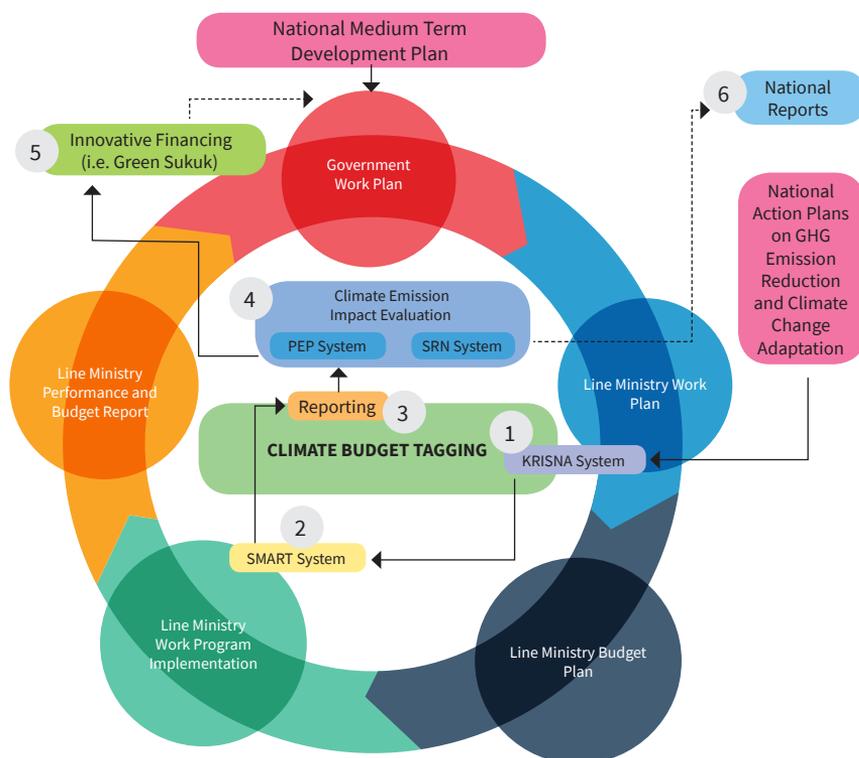


Source: Fiscal Policy Agency, Ministry of Finance (processed data)

In general, budget tagging can be interpreted as a process of attaching a tag or mark to the planning and budgetary documents that will be useful for tracking and identifying the output of a certain activity and its budget. Thus, the tagging of the budget for climate change is a process of identifying the amount of budget used to finance a specific output from activities related to the mitigation and adaptation to climate change.

Tagging of the budget in 2016 and 2017 was done for activities related to the mitigation of climate change in the Work and Budget Plan for Ministries and Institutions (RKA K/L) through the ADIK (Architecture and Performance Information) System. At present, the tagging of the budget, both for activities of mitigation and adaptation is carried out by marking the output found in the Work Plan of Ministries/Institutions (Renja K/L) through the KRISNA system (Collaboration in Planning and Budget Performance Information system).

Illustration 6 Budget Tagging in the National Planning and Budgeting Cycle



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

#### 4.1.1. Methodology and Procedure for the Climate Change Budget Tagging

The process of budget tagging follows the cycle of planning and budgeting of the government. In the year 2018, budget tagging was performed using the KRISNA system, which was developed by the Directorate for Systems and Procedures (DSP) of Bappenas and the Directorate General of Budgeting Systems (DSP) of the Ministry of Finance. Climate budget tagging takes place at the output level because, at this level, proper information is available for identifying indicators for targeted development and allocated budget outcomes. This makes it easier to identify and analyze the appropriateness according to the definitions and scope of actions for mitigation and adaptation to climate change. The output level is the best choice for tagging because it will reflect the activities carried out by the unit or related work unit, without having to examine the achievements in detail that would require more time and effort. Tagging at the output level can also show a comparison between the budget and realization of the budget in two different systems, namely the ADIK system managed by the Directorate

General of Budget (DJA) and the SPAN (State Treasury and Budget) system which is managed by the Directorate General of Treasury (DJPb). For the fiscal year 2018, tagging at the output level<sup>38</sup> continued to be used in the KRISNA system managed jointly between Bappenas and the Ministry of Finance.

The process of budget tagging is performed through several phases beginning with the collection of output data from the activities up to the process of analyzing the budget data. Budget tagging for climate change began in 2016 which involved six ministries related to mitigation. Later, from 2018, budget tagging for climate change added the theme of adaptation which involved sixteen ministries.

In the cycle of planning and budgeting of development, the tagging of a budget will be performed during the phase of drafting the Work Plan of Ministries/Institutions (Renja M/Is) and the Work and Budget Plan for Ministries and Institutions (RKA M/Is). The first phase in tagging a budget for climate change is to collect the data on outputs related to climate change from the planning and budgeting systems (ADIK and KRISNA). This initial data will then go through a process of independent analysis performed by the technical ministry/agency in connection with mitigation and adaptation to climate change with reference to the national policies related to climate change (RAN GRK, RAN API, NDC). Further, in order to ensure the validity of the output, the output data obtained from the analysis must be consulted to the Ministry of Finance, Ministry of National Development Planning (Bappenas), and Ministry of Environment and Forestry. This process also aims to identify which output has direct impact and which has indirect impact on the reduction of emissions.

The output data obtained from validation process shall become a reference for the technical Ministries/Institutions (M/Is) to carry out tagging for mitigation (theme 004) and adaptation (theme 007) in the planning and budgeting system, in the process of drafting a work plan and a work & budget plan for the ministries/institutions. Implementation of the budget from the tagged output can be monitored through the SMART System (Integrated Performance Monitoring System), whereas the realization of the budget can also be known, namely through SPAN (State Treasury and Budget System). An analysis on the results of tagging the budget for climate change will be made by the Ministry of Finance and published periodically so that it can be utilized for various purposes and interest.

The data used in this chapter is the budget data from the fiscal years 2016 to 2018. The analysis for the fiscal years 2016 to 2017 was made both for the budget/limit as well as realization of the budget, while for the fiscal year 2018 it was limited only to the budget/limit<sup>39</sup>. Based on the RAN

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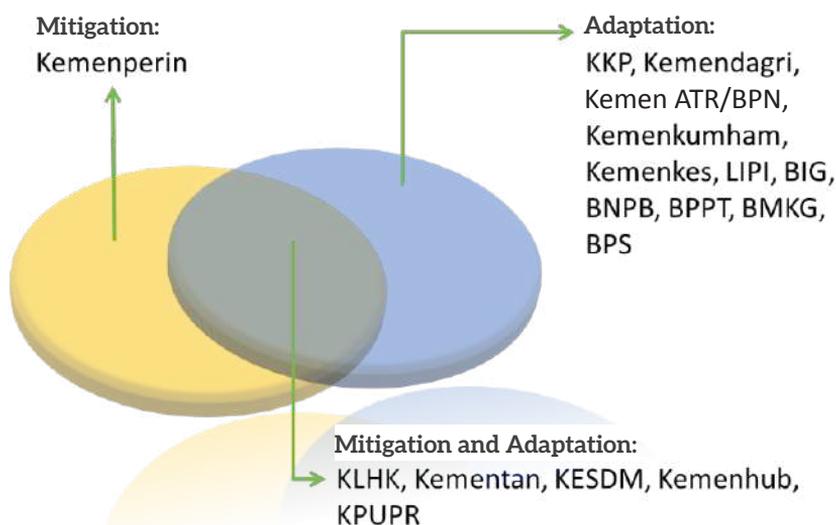
<sup>38</sup> Budget tagging at the output level actually is unable to provide adequate information about which activities have direct impact and indirect impact. Identification of the activities that have a direct impact and indirect impact is currently done manually by the ministries/institutions at the component level.

<sup>39</sup> Data on realization of the 2018 budget was not available at the time of preparing this report.



GRK (National Action Plan for Greenhouse Gas Emission Reduction) and RAN API (National Action Plan for Climate Change Adaptation), there are 6 ministries with a mandate to carry out mitigation activities and 16 ministries for adaptation activities. In addition, there are 5 ministries that will be responsible for performing both mitigation and adaptation activities (illustration 7). From the ministries/institutions included in the analysis, not all units at the directorate general level and directorate level carried out tagging, only those that have tasks and functions related to mitigation and adaptation.

*Illustration 7 The Ministries and Institutions Assigned to Perform Activities for Mitigation and Adaptation to Climate Change*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

**Note:**

- KPUPR: Ministry of Public Works and Housing
- Kemen ATR/BPN: Ministry of Agrarian Affairs and Spatial Layout/  
National Land Agency
- KESDM: Ministry of Energy and Mineral Resources
- KLHK: Ministry of Environment and Forestry
- Kemendagri: Ministry of Home Affairs
- Kemenkes: Ministry of Health
- Kemenkumham: Ministry of Law and Human Rights
- LIPI: Indonesia Science Agency
- BPPT: Agency for the Study and Application of Technologies
- BMKG: Meteorology, Climatology & Geophysics Agency

- KKP: Ministry of Marine Affairs and Fishery
- Kemenhub: Ministry of Transportation
- Kementan: Ministry of Agriculture
- Kemenperin: Ministry of Industry
- BNPB: National Disaster Management Agency
- BPS: Central Statistics Board
- BIG: Geospatial Information Board

Mitigation budget tagging has been implemented since 2016 and executed by six ministries identified in the RAN GRK. Meanwhile, the tagging of adaptation budgets has been implemented since the fiscal year 2018 by eight ministries/institutions, namely the Ministry of Environment and Forestry, the Ministry of Agriculture, the Ministry of Energy and Mineral Resources, the Ministry of Public Works and Housing, the Ministry of Marine Affairs and Fishery, BIG, BPPT, BMKG. While the other eight ministries/institutions

includes: the Ministry of Transportation, the Ministry of Home Affairs, the Ministry of Health, Ministry of Agrarian Affairs and Spatial Layout/ National Land Agency , the Ministry of Law and Human Rights, LIPI, BNPB, and BPS have not yet performed any tagging of adaptation budget in the fiscal year 2018.

In the tagging of budgets related to mitigation and adaptation activities at five ministries assigned to this task, namely the Ministry of Environment and Forestry , the Ministry of Agriculture, the Ministry of Energy and Mineral Resources, the Ministry of Transportation, and the Ministry of Public Works and Housing, the tagging of the mitigation and adaptation budgets could be implemented simultaneously as one activity (multi-tagging). The scheme for tagging two types of activity (mitigation and adaptation) shows that there is a 'co-benefit' scheme. However, even though the tagging of mitigation and adaptation activities could be done simultaneously since 2018, not all the ministries were doing the tagging using this co-benefit scheme, and therefore the budget for adaptation and mitigation in 2018 was a budget for different activities.<sup>40</sup>

In this section will be explained an analysis on the trends and composition of mitigation and adaptation budgets, allocation of mitigation and adaptation budgets, and mitigation budgets that have a direct impact and indirect impact<sup>41</sup>. Although there is no standard calculation regarding the reduction of GHG emission at the ministries assigned to tag mitigation and/ or adaptation budgets, the government has initiated a calculation of the reduction in emissions at several projects already implemented such as the construction of the Solar Power Plant (PLTS) by the Ministry of Energy and Mineral Resources and the multiple railroad track project for the Northern Java route, the Jabotabek train transportation project by the Ministry of Transportation. Hopefully, there will be a standard for calculating the reduction of GHG emission in the future and the result can be used for evaluation with the commitment that was agreed upon in NDC.

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40 There is one ministry that performs output tagging simultaneously for mitigation and adaptation (co-benefit),

41 The mitigation budgets of 2018 that have a direct impact are classified according to the categories in the Guidelines for Determining Mitigation Actions for Climate Change issued by the Ministry of Environment and Forestry.



*Illustration 8 One of the project from the Ministry of Energy and Mineral Resources Solar Panel Power Generation Project*



Source: Ministry of Energy and Mineral Resources

### 4.1.2. Utilizing the Results of Climate Budget Tagging

Budget tagging activities are very important for directing the government in budget allocations and guidance starting from the planning to the evaluation phase. Internally, the ministries and institutions can utilize the budget tagging results for evaluation of climate change mitigation activities that were carried out to further serve as the basis for budget allocation in the following year. Even so, the budget tagging results are expected not only for internal M/Is use but also for other institutions such as the Ministry of Finance as an analysis of Performance Based Budgeting and preparing budget priorities and reports on Indonesia's commitment to the climate change efforts of UNFCCC.

Results of the climate budget tagging can be utilized as follows:

#### 1. **Strengthening the Performance Based Budgeting**

As an effort to improve the quality of activity, monitoring and reporting, the Ministry of Finance issued the Regulation of the Minister of Finance (PMK) No. 214 Year 2017 concerning the Procedures for Measurement and Assessment of the Budget Performance Evaluation. With this PMK, the application of PBK can be more measurable both in terms of budgeting as well as achievement of targets (in this case GRK emission reduction and increasing climate resilience). By using the principle

of Performance Based Budgeting (PBB), the concept of performance information for climate change can be described by Table 6. This concept connects the M/Is expenditure function with the planning, budgeting, and climate change mitigation targets (GHG emission reduction) and climate change adaptation targets (increased resilience to the effects of climate change).

*Table 6 Performance Information Structure of Climate Change*

Function	Input	Activity	Output	Customer	Outcome	Condition
Central Government Expenditure	Objectives stated in the RKP submitted in the current year Financial Note	Activities related to mitigation and adaptation of the current year	Output and targets contained in the RKP submitted in the Financial Note of the current year	Work Unit on M/I Programs and Activities	Achievement indications of GRK emission reduction (RAN GRK) and increasing climate resilience (RAN API)	Achievement targets for reducing emissions and increasing climate resilience of each M/I

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

The input and output columns are the objectives and targets contained in the Government Work Plan that is translated into the expenditure function in the Financial Note document. This activity column consists of programs and activities according to the level and mechanism of planning and budgeting. For the analysis of climate change PBB, in the outcome column are achievement indications of GRK emission reductions (RAN GRK) and increased climate resilience (RAN API). For the purposes of monitoring the achievements of climate change mitigation and adaptation, the achievement targets for GRK emission reduction and increased resilience are stated in the condition column annually.

## 2. Information Sources for Reports at the National and International Levels

One of the objectives of the climate budget tagging is to increase transparency by becoming a source of information for the public to find out the budget amount that has been allocated to control the impact of climate change. The data analysis results encourage climate change funding to become a strategic issue in the preparation of the Macroeconomic Policy and Principles of Fiscal Policy (KEM-PPKF). The data is expected to be a source of information for the Climate Change Action Report issued by the government in the future.

At the international level, Indonesia as a member of UNFCCC has the obligation to carry out conventions, one of which is reporting the progress of handling climate change through the National Communication Report<sup>42</sup> that presents GHG inventory data, climate change adaptation and mitigation action plans, also needs and support received either in terms of funding as well as capacity building related to climate change. Climate change budget data can be used as material

<sup>42</sup> First National Communication (FNC, 1999), Second National Communication (SNC, 2010) and First Biennial Update Report (BUR, 2016). In 2017, Indonesia submitted the Third National Communication (TNC, 2017)

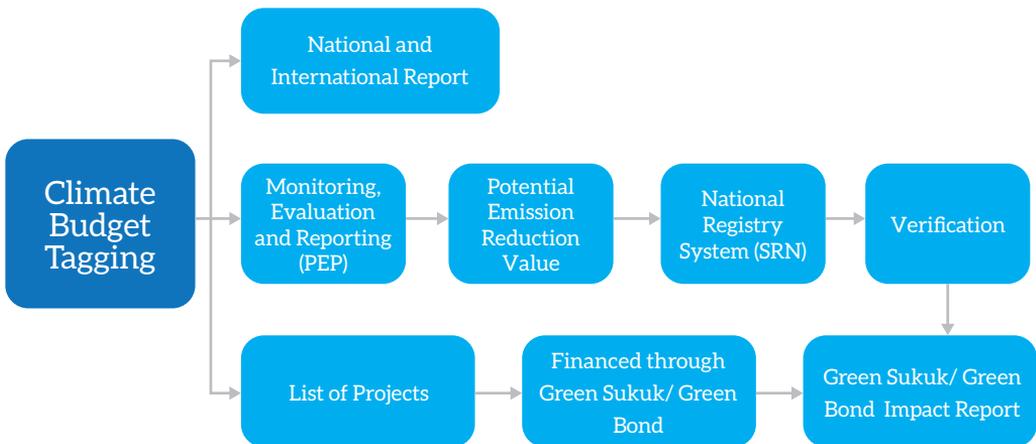
for national communication reports and to determine the need for international funding support.

### 3. Reference for the Preparation of Green Bonds/ Sukuk Innovative Financing

The results of the budget tagging process are used to prepare innovative financial instrument initiatives to address climate change in the form of Green Bonds and Green Sukuk. At the end of 2017, the government issued a green bond and green sukuk framework. This framework regulates the issuance of green bonds and sukuk, and the criteria for green projects that can be financed. The selection of green projects that qualify is through a list of climate change outputs that are tagged by M/Is in the KRISNA system. This framework has gone through a review process by an international independent institution (CICERO) and obtained the value of Medium Green.

Through synergy and integration between Monitoring, Evaluation and Reporting (PEP) system which is managed by Bappenas and National Registry System (SRN) which is managed by the Ministry of Environment and Forestry, Climate Budget Tagging is hoped to serve as an input in the analysis of potential emission reduction, and reported in the Indonesia's national and international report of climate change mitigation. In short, how to leverage the result of Climate Budget Tagging can be seen below:

Illustration 9 Utilizing the Result of Climate Budget Tagging



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

## 4.2. Result of Climate Change Mitigation and Adaptation Budget Tagging Analysis

Indonesia's climate change budget experienced an increase between 2016 and 2018. Indonesia's climate change budget grew by 51.6 percent from IDR72.4 trillion

in 2016 to IDR109.7 trillion in 2018. The increase occurred not only in value, but also the proportion against the overall state budget.

**Table 7 Budget Allocation for Climate Change in the State Budget 2016-2018**

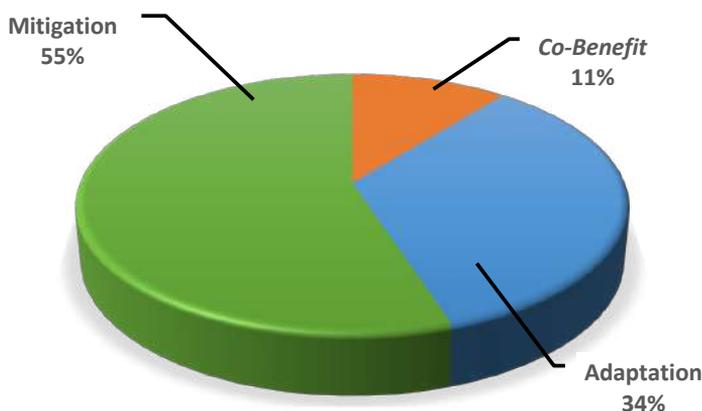
Year	Climate Change Mitigation Budget (IDR trillion)	Climate Change Adaptation Budget (IDR trillion)	Portion of the Climate Change Budget in APBN
2016*	72.4	NA	3.6%
2017*	95.6	NA	4.7%
2018	72.2	37.5	4.9%

\* Year 2016 and 2017 are the APBN-P budget ceiling and the adaptation budget tagging has not been carried out  
 Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

### 4.2.1. Composition of the Climate Change Mitigation and Adaptation Budget

The composition of mitigation and adaptation activities, including the budget allocation, becomes important and is currently the direction of international climate change policies<sup>43</sup>. However, in the NDC, mitigation activities appear more superior compared to adaptation. This is because mitigation activities are more visible and measurable in achieving the targets, for example renewable energy power plants that can be directly related to GRK emission reductions.

*Illustration 10 Composition of Indonesia's Climate Change Budget for 2018*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Currently, for adaptation activities, it is still quite difficult to obtain a consensus on the assessment of its performance achievements, although the impact and benefits of adaptation activities are becoming more important in the long run. In addition, the composition that needs to be displayed are co-benefit activities, namely activities that have a positive impact in terms of emissions reduction and increasing resilience against climate change.

43 For example the GCF funding that allocates mitigation budgets comparable to adaptation (50:50)



The tagging of the climate change budget in 2018 does not only tag mitigation activities but also climate change adaptation activities. Illustration 9 presents the composition of the climate change budget in 2018, where the largest is for mitigation activities, with 55 percent of the total budget. In addition, it can also be observed that the budget for co-benefit activities is 11 percent of the total climate change budget.

*Table 8 Composition of Mitigation and Adaptation Budgets from the Ministry and Institution in 2018 (billion IDR)*

Implementing Institution	Mitigation			Adaptation			Co-Benefit	
	Output	Budget		Output	Budget		Budget	
KPUPR	32	IDR 38,572.2		100	IDR 35,521.4		IDR 11,812.4	
Kementan	8	IDR 442.1		3	IDR 231.2		IDR	
KESDM	25	IDR 2,597.8		4	IDR 350.9		IDR	
KLHK	48	IDR 2,179.9		13	IDR 1,122.8		IDR	
Kemenhub	16	IDR 16,595.6						
Kemenperin	7	IDR 28.0						
BPPT				6	IDR 37.1		IDR	
BIG				5	IDR 7.3		IDR	
BMKG				4	IDR 139.1		IDR	
KKP				5	IDR 87.4		IDR	
<b>TOTAL</b>	<b>136</b>	<b>IDR 60,415.7</b>		<b>140</b>	<b>IDR 37,497.2</b>		<b>IDR 11,812.4</b>	

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

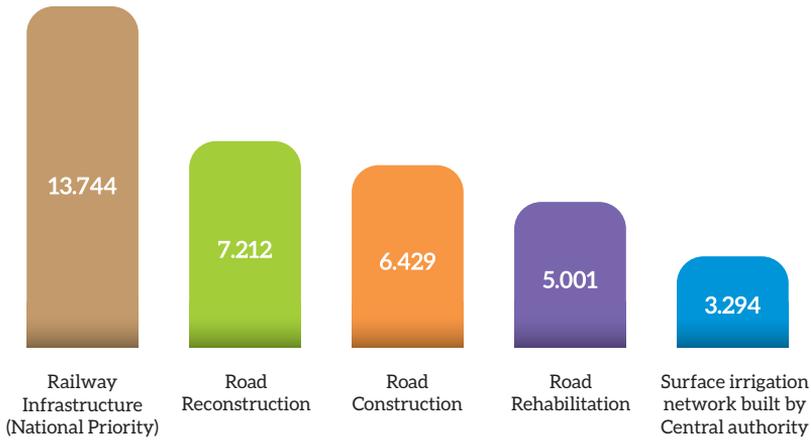
The budget allocation for controlling climate change in Indonesia, either in the form of mitigation as well as adaptation, is dominated by Ministry of Public Works and Housing. In Table 8, it can be observed that the total budget spent through the Ministry of Public Works and Housing reached IDR85.9 trillion with IDR50.4 trillion in the form of mitigation output and IDR35.5 trillion in the form of adaptation output. There is a co-benefit budget with adaptations originating from Ministry of Public Works and Housing Directorate of Water Resources reaching IDR11.8 trillion and divided into 13 outputs. The Ministry of Public Works and Housing 's mitigation and adaptation budget covers 81.2 percent of the total climate change budget of all ministries/ institutions in 2018.

The proportion of mitigation and adaptation budgets in Ministry of Public Works and Housing KPUPR is not significantly different. Meanwhile, if observing the Ministry of Environment and Forestry, the Ministry of Energy and Mineral Resources, and the Ministry of Agriculture that also have the duty of mitigation and adaptation, the proportion of the mitigation budgets in the three Ministries are significantly higher when compared to the proportion of the adaptation budget. Nevertheless, nominally the mitigation budget in the Ministry of Public Works and Housing is far higher than the three Ministries.

The amount of the budget is because Ministry of Public Works and Housing has the duty to build physical infrastructure that is illustrated in the total output. For example, the mitigation budget of IDR50.4 trillion in Ministry

of Public Works and Housing is used to finance 32 outputs, while the mitigation budget of IDR2.2 trillion in the Ministry of Environment and Forestry finances 48 outputs. If observed at the director general's level, the Directorate General of Highways is the unit that has the largest mitigation budget when compared to other units. When compared, the financing of road maintenance and municipal solid waste handling system issued by the Ministry of Public Works and Housing Directorate General of Highways is larger than the conservation and rehabilitation of degraded forest areas issued by the Directorate General of Natural Resource Conservation and the Ministry of Environment and Forestry Ecosystem.

*Illustration 11 Five Mitigation Outputs with the Largest Budget in 2018 (billion IDR)*



If observed based on output, even though the Ministry of Public Works and Housing has the largest mitigation budget value and output in 2018, the output with the largest budget value is not from Ministry of Public Works and Housing but from the Ministry of Transportation, namely procurement of railway infrastructure (national priority) with a budget value of IDR13.7 trillion to finance it (Illustration 11). Trains are mass public transportation, whose use will optimally reduce carbon emissions emitted by private vehicles. Furthermore, the output with the second to fifth highest budget value is the output originating from Ministry of Public Works and Housing, i.e. road reconstruction, road construction, road rehabilitation maintenance, and routine road maintenance.

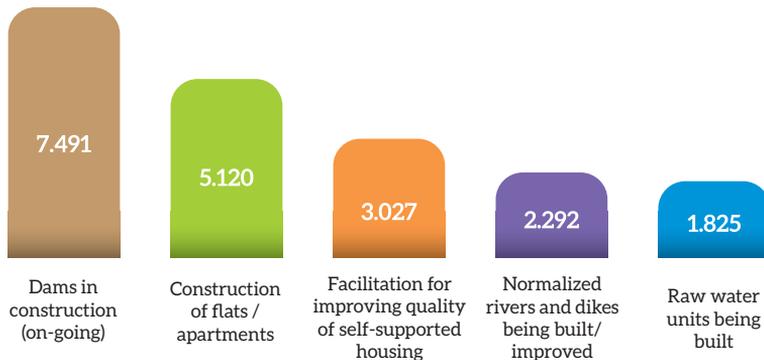


*Illustration 12 One of the projects from the Ministry of Transportation – Double track railroad Java*



Source: Ministry of Transportation

*Illustration 13 Five Output Adaptations with the Largest Budget in 2018 (billion)*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Furthermore for adaptation, five outputs with the largest budget in 2018 are all from Ministry of Public Works and Housing. The construction of dams, construction of flats, normalized rivers and dikes built/improved, raw water units built, and self-supported housing quality improvement facilities are the five outputs that have the highest value in the adaptation budget tagging in 2018 ranging from IDR1.8 trillion up to IDR7.4 trillion. The construction of raw water units and dams are supportive outputs in the food sovereignty sector that currently is one of the Nawacita goals of the government.

Even though physical projects have a direct impact on reducing emissions, it does not imply that non-physical projects have no impact in achieving these targets. For example, the preparation of regulations in the New and Renewable Energy (NRE) sector issued by the Directorate General of Renewable Energy and Energy Conservation (EBTKE) of the Ministry of Energy and Mineral Resources requires a much lower budget compared to the construction of the EBT power plant itself. However, the impact of these regulations can be more massive if the regulation can encourage Independent Power Producers (IPP) to change and enter the NRE market. Although the impact is difficult to measure, non-physical projects can also have an impact on reducing emissions.

In addition, beside the investment in physical projects, the government needs to encourage 'enabling environment' activities, such as in the form of capacity building, subsidies or tax cuts for activities that are environmentally friendly, standardized or the regulation itself. These activities can mobilize the flow of climate finance funding sources, especially from the private sector. This becomes very important for achieving the NDC, RAN GRK and RAN API targets because the government budget will not be able to meet the needs for achieving these targets.

## 4.2.2. Climate Change Mitigation Budget

The reduction of the mitigation budget in 2018 was followed by changes in the budget composition based on its actors. As explained earlier, KPUPR is the main actor at the national level in the implementation of programs and activities aimed to mitigate climate change. Compared to 2016, the role of this ministry is increasingly larger because of its increased budget, although in general there was a decrease in 2018. In 2016, the ministry budgeted approximately IDR43 trillion to mitigate climate change, drawing up approximately 59.75 percent of the mitigation budget in that year. The budget increased by 16.5 percent in 2018 with the mitigation budget reaching IDR50.4 trillion or 69.8 percent of the total national mitigation budget.

Table 9 Climate Change Mitigation Budget in 2016 - 2018

Implementing Institution	Budget (billions of IDR)					
	2016		2017		2018	
KPUPR	IDR	43,234.9	IDR	51,950.7	IDR	50,384.5
Kemenuh	IDR	21,004.3	IDR	34,233.5	IDR	16,595.6
Kementan	IDR	4,265.5	IDR	5,381.3	IDR	442.1
KESDM	IDR	2,173.7	IDR	2,844.1	IDR	2,597.8
KLHK	IDR	1,619.7	IDR	1,132.1	IDR	2,179.9
Kemenperin	IDR	53.8	IDR	42.9	IDR	28.0
<b>TOTAL</b>	<b>IDR</b>	<b>72,352.0</b>	<b>IDR</b>	<b>95,584.7</b>	<b>IDR</b>	<b>72,228.1</b>

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Note: the total KPUPR mitigation budget in 2018 includes the budget for co-benefit activities



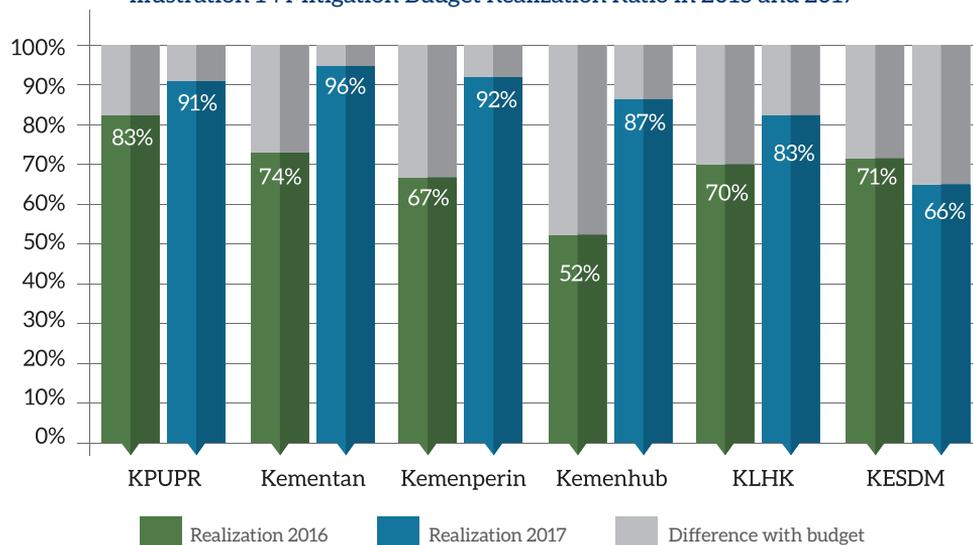
The Ministry of Transportation is the ministry with the second largest mitigation budget, illustrating that the ministry has an important role in this activity. Even so, the ministry's budget tends to fluctuate from year to year. In 2017, the Ministry of Transportation mitigation budget increased by 63 percent from 2016, but that figure dropped to 51 percent in 2018 with a value of IDR16.6 trillion. When observed from the number of outputs, there is an output reduction by 23 outputs, from 39 outputs to 16 outputs between 2017 and 2018.

Among these six ministries, the Ministry of Agriculture has the largest decrease in the mitigation budget by percentage. In 2017, the mitigation budget in this ministry reached IDR5.3 trillion with 27 outputs, which is the third highest budget. However, in 2018, the budget for this post experienced a very significant decrease reaching 91.8 percent to only IDR444 billion with 8 outputs. The Ministry of Environment and Forestry increased in 2018, while Ministry of Energy and Mineral Resources increased in 2017 even though decreased by approximately 12 percent in 2018. Among other ministries, the Ministry of Industry has the lowest mitigation budget. The cause of the drastic change in the tagging of mitigation budgets such as in the Ministry of Agriculture and Ministry of Transportation is because the change in the tagging system from the ADIK system to the KRISNA system. In addition, this drastic change is also an indication of the absence of standardized methods and definitions in the tagging of mitigation budgets.

### **Realization of Mitigation Budgets**

From Illustration 14, it can be seen realization ratio of mitigation budgets in 2016 and 2017 had an increasing trend. A significant increase is visible from the realization ratio in 2016 (69 percent) to 2017 (86 percent). In general, there was an increase in the realization ratio, with the most significant increase occurring in the Ministry of Transportation from 52 percent in 2016 to 87 percent in 2017. Whereas anomalies occurred in the Ministry of Energy and Mineral Resources that experienced a realization ratio of mitigation budget from 71 percent in 2016 to a slight decrease by 66 percent in 2017. The overall value of the mitigation budget realization also increased, from the value of IDR52.41 trillion in 2016 to IDR85 trillion in 2017.

Illustration 14 Mitigation Budget Realization Ratio in 2016 and 2017



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

In terms of the absorption of climate change mitigation budgets in 2017, the Ministry of Agriculture absorbed the budget by 96 percent which is the largest absorption of the mitigation budget when compared with the other five ministries. The Center for Agricultural Land Research and Development (PPSLP) is an echelon I unit that was able to absorb the largest budget, up to 99 percent. The largest absorption of the budget is used for the output of Recommendations on the Management of Agricultural Land Resources and Climate Change, that reached IDR1.6 trillion. The mitigation budget at the Ministry of Transportation in 2017 increased by IDR10.6 trillion. The absorption of the mitigation budget at the Ministry of Transportation reached 86.7 percent of the total budget change, which is IDR29.6 trillion. The highest absorption of mitigation budgets of the five echelon 1 units in the Ministry of Transportation are at the Secretariat General and Directorate General of Land Transportation after that.

Meanwhile, the decrease in the realization of the Ministry of Energy and Mineral Resources mitigation budget was partly due to the low budget absorption. The lowest budget realization in the Ministry of Energy and Mineral Resources occurred at the Directorate General of Oil and Gas by 60 percent, with the number of outputs also decreasing from 9 to 4 outputs. A number of outputs that are no longer budgeted in 2018 are the Gas Fuel Infrastructure for Transportation, BBM Conversion to Gas Fuel for Fishermen and Vehicles, LCNG/ LNG Stations, and LPG Storage Tanks.

In general, the realization for mitigation budget has shown an increasing trend. By average, the ratio between the realization for mitigation budget in 2017 reached 85,8 percent, which increased far beyond the previous fiscal year with the average of 69,5 percent. However, there are M/Is who



only absorb 66 percent out of total budget. Ideally, each M/Is should reach realization above 90 percent to support better environmental management and optimal target achievement in climate change.

### Mitigation Budget by Sector

The climate change mitigation budget in Indonesia is still concentrated in the energy and transportation-based sectors. In general, the ministries focus on one sector except the Ministry of Public Works and Housing and the Ministry of Environment and Forestry, as can be observed in Table 10.

*Table 10 Mitigation Budget per Sector in 2018*

Implementing Institution	Budget per Sector (billion Rp)					
	Land		Energy and Transportation		Waste Management	
KPUPR	IDR	11,812.4	IDR	36,114.8	IDR	2,457.3
KLHK	IDR	2,037.4			IDR	142.8
Kementan	IDR	442.1				
KESDM			IDR	2,597.8		
Kemenhub			IDR	16,595.6		
Kemenperin			IDR	28.0		
<b>TOTAL</b>	<b>IDR</b>	<b>14,291.9</b>	<b>IDR</b>	<b>55,336.2</b>	<b>IDR</b>	<b>2,600.1</b>

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Note: the KPUPR mitigation budget of Rp. 11,812.4 billion is a budget for co-benefit activities

In 2018, approximately 77 percent of the total mitigation budget was allocated for energy and transportation-based activities with a value of IDR55.33 trillion. While land-based activities contribute to the mitigation budget by 20 percent, and waste management only contributes by approximately 3 percent. If observed based on the distribution in the executing ministry, from the three existing mitigation sectors, energy and transportation-based activities are the most ministry-supported activities, namely the Ministry of Industry, Ministry of Energy and Mineral Resources, Ministry of Transportation, and the Ministry of Public Works and Housing.

The Ministry of Public Works and Housing has the largest amount of budget in every sector compared to the five other ministries. Among these sectors, the largest budget is allocated for energy and transportation-based activities. Referring to the PU Regulation of the Minister No. 11/PRT/M/2012 about the National Action Plan for Climate Change Mitigation and Adaptation for 2012-2020 of the Ministry of Public Works and Housing divides mitigation activities into four sub-sectors; 1) water, 2) roads and bridges, 3) creation of works, and 4) spatial planning (Table 11). Among these sectors, the transportation sector is the main focus through the maintenance and capacity improvement of national roads carried out by the Directorate General of Highways with the budget of 2018 reaching IDR36.1 trillion.

**Table 11 Climate Change Mitigation Strategies of the Ministry of Public Works and Housing**

Water Sub-sector	Roads and Bridges Sub-sector	Creation of Works Sub-sector	Spatial Planning Sub-sector
Water management on peat lands in order to control GHG emissions	Developing the concept of environmentally friendly road transportation networks and climate change responses	Encourage the application and management of buildings and the environment in order to reduce GHG emissions	Encourage the realization of at least 30 percent of the watershed areas of provincial and district/ city forests in increasing carbon sink
Increasing the capacity of critical watersheds, upstream areas and polluted water sources	Reducing congestion in urban areas (while reducing motor vehicle emissions into the atmosphere)	Encouraging the application of technology and environmentally friendly waste and garbage management	Mainstreaming low-carbon economic concepts in the implementation of spatial planning
Develop methods for measuring and reporting MRV-based climate change mitigation implementation against GHG emissions in the water resources sector	Develop and encourage the use of construction technology and road materials that are more environmentally friendly and responsive to climate change.	Encourage the application of waste water treatment technology with gas capture	Develop the ecological footprint concept in spatial planning
Develop the environmentally friendly technology (green technology) in the water resources sector that can reduce GHG emissions		Develop the MRV methods in climate change related activities in urban areas	Develop MRV methodology for reducing carbon emissions in the implementation of provincial and district/ city spatial planning

Source: Fiscal Policy Agency, Ministry of Finance (processed data)

The climate change mitigation approach in this sector is by developing the concept of environmentally friendly networks, reducing congestion in urban areas and developing construction technologies and environmentally friendly materials. The construction of new roads, especially in areas with low access, is indispensable, so land conversions are inevitable. As an effort to reduce GHG, the Ministry of Public Works and Housing emphasizes on increasing compliance to project implementation related to environmental regulations, planting trees along national roads and adjusting roads to conform with geometric standards. Congestion in urban areas is a source of high GRK emissions, so cutting the travel duration is a must<sup>44</sup>. To reduce travel time, the Directorate General of Highways focuses on the construction of flyovers and underpasses, bridges and toll roads.

KPUPR also has an important role in maintaining the existence of swamp landscapes carried out by the Directorate General of Water Resources. In 2018, the budget for the construction of swamp irrigation networks reached IDR107 billion and the budget for rehabilitation/improvement of existing swamp irrigation networks reached IDR299 billion. Swamp irrigation

<sup>44</sup> Bhandari et al (2013) (<https://doi.org/10.1016/j.sbspro.2013.11.213>) estimates fuel use when vehicles are not moving, cars consume around 0.7 liters per hour and motorbikes consume 0.17 liters per hour. In the tomtom traffic index ([https://www.totom.com/en\\_gb/trafficindex/city/jakarta](https://www.totom.com/en_gb/trafficindex/city/jakarta)), congestion in Jakarta causes that the duration of a trip is 48 minutes longer if compared when there is no traffic jam. Accordingly, roughly, congestion causes a loss of fuel of approximately 0.56 liters for cars and 0.136 liters for motorcycles that certainly contributes to GRK emissions.



networks have risks related to GRK emissions if the land in the swamp landscape is peat. However, referring to PP No. 71/2014 regarding Peat Ecosystems, Ministry of Public Works and Housing is prohibited to utilize peat swamps as irrigation sources, so that it can prevent potential GRK emissions from peatland fires. In addition, Ministry of Public Works and Housing can utilize the water management budget for water management on peatlands. For example, part of the surface irrigation network budget and lake revitalization amounting to IDR3.77 trillion and IDR775 billion can be directed for re-wetting peatlands.

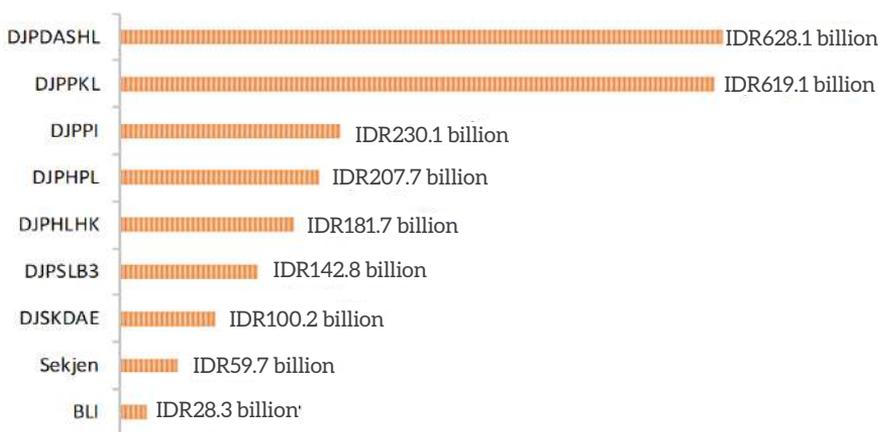
According to its main duties and functions, the Ministry of Environment and Forestry has a significant role in relation to climate change mitigation and adaptation, especially in terms of forestry land-based activities. In Law No. 41/1999 regarding Forestry, the Ministry of Environment and Forestry, as a ministry with duties and responsibilities in the forestry sector, was given authority related to the establishment of forest areas, including the granting of business licenses to utilize forest products. The management of national-level conservation areas is the responsibility of the Ministry of Environment and Forestry through KPHK, in accordance with Government Regulation No. 6/2007 regarding Forest Management and the Preparation of Forest Management Plans, and Forest Utilization. Referring to the Regulation of the Minister of the Environment and Forestry No. 16/2017 regarding Peat Ecosystem Recovery, the Ministry of Environment and Forestry has the duty to restore the peat ecosystems in conservation forests<sup>45</sup>. These regulations are only partially showing the role of the Ministry of Environment and Forestry in the forestry land management.

Among the nine Directorate Generals that carry out mitigation tagging, the Directorate General of Watershed and Forest Protection (PDASHL) and the Directorate General of Pollution and Environmental Damage (PPKL) have the largest climate change mitigation budget. In the broad outline, observed from the budget composition, these two Directorate Generals have the duty to restore areas. The Directorate General of PDASHL is responsible to restore protected forest areas and watersheds, while the Directorate General of PPKL covers the restoration and recovery of peatlands.

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<sup>45</sup> At present the duty of restoring peatland is held by the Peat Restoration Agency (BRG)

*Illustration 15 The Climate Change Mitigation Budget is based on the Directorate General of KLHK in 2018*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Remarks

BLI: Research, Development and Innovation Agency

Sekjen: Sekretariat General

DJSKDAE: Directorate General of Natural Resource Conservation and Ecosystems

DJPSLB3: Directorate General of Waste, Garbage and Hazardous and Toxic Material Management

DJPHLHK: Directorate General of the Environment and Forestry Law Enforcement

DJPHPL: Directorate General of Sustainable Production Forest Management

DJPPPI: Directorate General of Climate Change

DJPPKL: Directorate General of Pollution and Environmental Damage

DJPDASHL: Directorate General of Watershed and Forest Protection

For Ministry of Energy and Mineral Resources, the highest energy-based mitigation budget is placed at the Directorate General of New Energy, Renewables and Energy Conservation (DG-EBTKE), with approximately 59.3 percent of total energy-based mitigation budget for this ministry in 2018. DG-EBTKE has a very important role especially in the development and mainstreaming the renewable energy and energy conservation in Indonesia's future energy mix. Observed from the budget structure, DG-EBTKE focuses more on the utilization of solar power for lighting in rural and 4T (underdeveloped, foremost, outermost, and transmigration) areas with a budget coverage with approximately IDR900 billion and energy conservation with a budget for the purchase of equipment amounting to IDR407 billion. In addition, DG-EBTKE also conducts a other activities including service, regulation development, research and guidance for renewable energy and energy conservation. Aside from DG-EBTKE, the Directorate General of Oil and Gas also has a large role in the energy sector through the construction of natural gas networks for households with a budget of IDR827 billion<sup>46</sup>. The role of the Ministry of Energy and Mineral

<sup>46</sup> The fuel source for household cooking in Indonesia is still dominated by LPG in tube packaging, whereas in terms of resources, natural gas resources in Indonesia are higher compared to LPG which is a by-product of the crude oil production (<https://finance.detik.com/energi/d-2461492/apa-bedanya-jaringan-pipa-gas-ke-rumah-dengantabung-lpg>) so a natural gas pipeline infrastructure construction is needed. In addition, natural gas (56.1



Resources in this case is still considered as an implementing institution by carrying out activities/projects in the field (project at site). In this particular field, the government can indeed function as a pioneer to the projects/programs which are not attractive enough to the private sector. However, for purposes of developing renewable energy and energy conservation activities, the role of the private sector should be emphasized and underline the role of ministry as sector directors and regulators.

From the sector-based mitigation budget allocation in Table 10, it can be observed that the government's mitigation budget allocation is very focused on reducing GRK emissions through energy and transportation-based projects carried out by Ministry of Public Works and Housing, Ministry of Energy and Mineral Resources and the Ministry of Transportation. In fact, based on GHG emission reduction targets in NDC and RAN-GRK, the reduction in land-based emissions is the sector with the highest target compared to other sectors. The energy-based sector itself is the third priority in RAN-GRK and second priority in NDC. In addition, no budget was found with the tagging for the agricultural sector. All mitigation budgets issued by the Ministry of Agriculture are tagged as non-agricultural land-based mitigation expenditures.

Budget allocations and NDC targets cannot be compared by apple-to-apple, but budget allocation can be an indicative illustration of the government's focus on development. This is of course a joint evaluation of how to carry out the tagging of the mitigation and adaptation budgets so that it is conform the existing targets of the current RAN-GRK as well as NDC in the future.

### **Mitigation Budget with Direct and Indirect Impacts**

Referring to the Guidelines to Determine Climate Change Mitigation Action issued by the Ministry of Environment and Forestry, the result of the budget tagging can be used to analyze the mitigation budget allocation that provides direct and indirect impacts toward the target of the GHG emission of each output that is carried out by the ministry. The definition of climate change mitigation actions with direct and indirect impacts refer to the definitions found in the Manual for Determining Climate Change Mitigation Actions published by the Ministry of Environment and Forestry<sup>47</sup>.

Activities with direct impacts (core activities) are a form of activities that will directly reduce emissions or increase GHG sequestration from the emissions source or carbon sequestration, while activities with indirect impacts (supporting activities) are a form of activities whose impacts towards emissions reductions or GHG sequestration happen through the effects of these activities towards supporting factors or causes of

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kgCO<sub>2</sub>/GJ) has lower emissions compared to LPG (63.1 kgCO<sub>2</sub> / GJ) ([https://www.volkerquaschnig.de/datserv/CO2spez/index\\_e.php](https://www.volkerquaschnig.de/datserv/CO2spez/index_e.php)). Natural gas is indeed contained in the NDC, but it is not entirely clean energy as set forth in UNFCCC, likewise is clean coal that still causes debates.

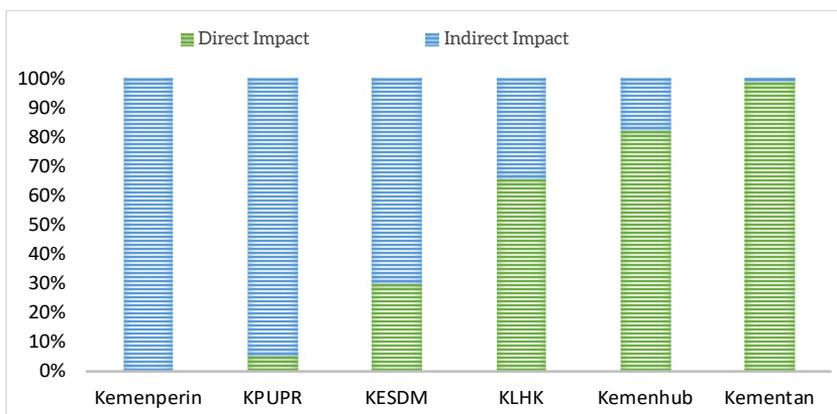
<sup>47</sup> The guidebook contains a description of mitigation actions that have direct and indirect impacts on emission reductions compiled according to the mitigation action component, criteria, indicators, and physical evidence of the indicators, as well as the activity units of the mitigation action components carried out in the energy, forestry, agriculture, waste, and IPPU sectors. .

emissions or sequestration. For instance, in the forestry sector, mitigation action components with direct impacts include the preservation of conservation forest (KPHK), nature reserve (KPHL), and production forest (KPHP) management unit areas from forest fires, illegal logging, and forest encroachment. Meanwhile, indirect activities include studies, research, and counseling/socialization.

As presented in illustrations 14, the Ministry of Agriculture has the highest percentage of the mitigation budget that has direct impacts compared to the other ministries. From the total mitigation budget of the Ministry of Agriculture, which reaches IDR442 billion, 98.81 percent or the value of IDR436 billion is used to finance the mitigation activities with direct impacts. The activity is centered at the Directorate General of Plantations, which is to support plantation protection activities with outputs of activities in the form of handling the impacts of climate change and prevention of land/garden fires, at the Directorate general of Agriculture Infrastructure and Facilities (DPSP), namely for irrigation water management activities for agriculture (tertiary irrigation networks, development water resources, water conservation buildings, and construction of agricultural reservoirs), and at the Directorate General of Animal Husbandry and Animal Health for activities to increase animal feed production with fodder output which includes land management and fencing and supporting buildings.

Although it has only the proportion of 82 percent of its total mitigation budget, the Ministry of Transportation has the highest value of the mitigation budget allocation with direct impacts, amounting to IDR13.6 trillion. This illustrates the Ministry of Transportations commitment in the construction of transportation infrastructure that supports GHG emission reduction, both in road, sea, air, and rail transport.

*Illustration 16 Composition of Mitigation Budget with Direct and Indirect Impacts for Each Implementing Institution in 2018*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

\*note: a) Data of the Ministry of Agriculture of 2017 is not available; b) All activities at the Ministry of Industry have indirect impacts



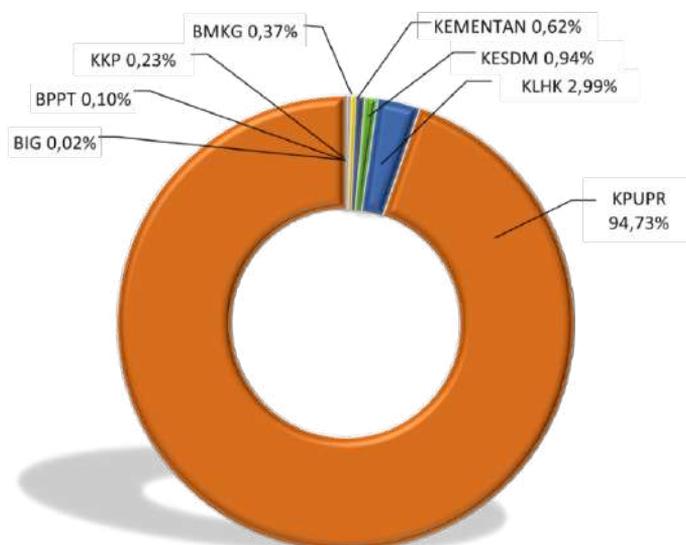
Furthermore, the second largest value of the mitigation budget with direct impacts is provided by the Ministry of Public Works and Housing, amounted IDR2.52 trillion, although the percentage is only five percent of its total mitigation budget. The activities at the Ministry of Public Works and Housing with direct impacts only take place at the Directorate General of Human Settlements in the waste water processing system activities and trash processing system activities.

On the other hand, until 2018, 100 percent of the mitigation budget at the Ministry of Industry has indirect impacts on the target of the GHG emission reduction. This is because most of the outputs of the Directorate General of High Technology Based Supreme Industry and the Climate Policy and Industrial Quality Study Agency are still in form of policies, so that they have indirect impacts on the emission reduction.

### **4.2.3. Climate Change Adaptation Budget**

Based on the National Action Plan on Climate Change Adaptation (RAN-API), 16 Line Ministries/Institutions have been appointed for the implementation of the adaptation budget tagging. The tagging of adaptation budget commenced in 2018 with 8 Ministries/Institutions that have carried out the budget tagging, namely the Ministry of Public Works and Housing, Ministry of Environment and Forestry, Ministry of Energy and Mineral Resources, Ministry of Agriculture, Meteorological, Climatological and Geophysical Agency (BMKG), Ministry of Marine Affairs and Fisheries, Agency For The Assessment And Application Of Technology (BPPT), and Geospatial Information Agency (BIG). Meanwhile, 8 other Ministries/Institutions, namely the Ministry of Transportation, Ministry of Home Affairs, Ministry of Health, Ministry of Agrarian and Spatial Layout, Ministry of Law and Human Rights, The Indonesian Institute of Sciences (LIPI), National Agency for Disaster Countermeasure (BNPB), and Central Bureau of Statistics (BPS) have not yet carried out the adaptation budget tagging.

Illustration 17 Distribution of Adaptation Budget for each Implementing Institution in 2018



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

In addition to having the largest mitigation budget tagging, Ministry of Public Works and Housing has also the largest adaptation budget, as shown in Illustration 17. The Ministry of Public Works and Housing has the adaptation budget of IDR35.5 trillion, while the Ministry of Environment and Forestry, as the ministry with the second largest budget, have the budget of IDR1.1 trillion. Meanwhile, the smallest budget tagging is recorded by BIG with the value of IDR7.3 billion. However, only 8 of the 16 ministries/Institutions that are mandated at the National Action Plan on Climate Change Adaptation have carried out the adaptation budget tagging in 2018. The Ministry of Transportation, Ministry of Home Affairs, Ministry of Health, Ministry of Agrarian and Spatial Layout, LIPI, BPPN, BPPT, and BPS were 8 Ministries/Institutions that have not yet carried out the adaptation budget tagging in 2018.

Table 12 Climate Change Adaptation Budget of 2018

Implementing Institution	Output	Budget (billions of IDR)
KPUPR	100	35,521.4
KLHK	15	1,122.8
KESDM	4	350.9
Kementan	3	231.2
BMKG	4	139.1
KKP	5	87.4
BPPT	6	37.1
BIG	5	7.3
<b>TOTAL</b>	<b>142</b>	<b>37,497.2</b>

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

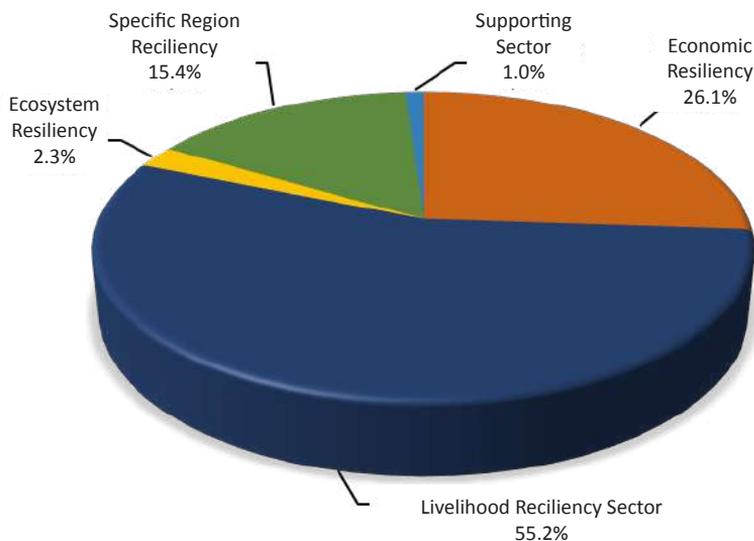


The target of the National Action Plan on Climate Change Adaptation consists of five main sectors, namely the sectors of economy, livelihood, ecosystem, specific region, and supporting system. The scope of adaptation activities covers several subsectors that refer to the targets of RAN API that was issued by Bappenas in 2014 (as seen on Table 3). For instance, in the economic resiliency sector, one of the energy independence subsector's targets was increasing the utilization of renewable energy sources in remote villages, supporting ecosystem conservation and a sustainable energy supply. Meanwhile, in the livelihood resiliency sector, one of the housing subsector's targets was an increased access towards affordable and decent housing.

The livelihood resiliency and economic resiliency share the top priority in the adaptation activities. These two sectors were responsible for over 80 percent of the adaptation budget tagging in 2018.

More than fifty percent of the adaptation budget in 2018 was supported by the livelihood resiliency sector with the proportion of 55.2 percent of the total adaptation budget or amounting to IDR27.2 trillion. The second priority in the adaptation budget is at the economic resiliency sector with the proportion of 26.1 percent, while the third priority is at the specific region resiliency with 15.4 percent. Furthermore, the proportions of the budget with the ecosystem resiliency sector and supporting sector are only small portions of the adaptation budget of 2018, respectively contributing 2.3 percent and 1 percent of the total budget.

*Illustration 18 Adaptation Budget per Sector of 2018*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

The livelihood resiliency is the sector with the most clusters, namely 12 clusters and supported by various ministries, so that it becomes the priority in the adaptation budget in accordance with the National Action Plan on Climate Change Adaptation. An example of activity in the livelihood resiliency sector is the development of state-owned flats and infrastructure maintenance in the form of dams. Meanwhile, the economic resiliency sector has 11 clusters and the specific region resiliency sector has 10 clusters, which respectively are the second priority and third priority in the adaptation budget tagging of 2018. Examples in the economic resiliency sector are swamp irrigation, rice field development and irrigation network development. Meanwhile, activities in the specific region sector are among others the restoration of coastal area and small islands and rehabilitation of small islands located north of Java Island.

The development of irrigation system under the Ministry of Public Works and Housing has the highest budget allocation and supports the programs in the food sovereignty sector as one of Nawacita agendas.

Of the five existing sectors, the Ministry of Public Works and Housing has the largest budget for the four existing sectors, i.e. the economy, livelihood, specific regions, and supporting system sectors. Meanwhile, the Ministry of Environment and Forestry has the largest budget in the ecosystem sector. At the livelihood sector, which contributes more than 50 percent of the adaptation budget, the Directorate General of Water Resources, Ministry of Public Works and Housing, has the highest

budget with the value of three adaptation budget priority sectors, namely at the livelihood sector, economic resiliency, and specific regions. The Directorate General of Water Resources has a budget of IDR15.03 trillion that is allocated for adaptation activities in the livelihood sector. Meanwhile, the Directorate General of Water Resources has a budget of respectively IDR12.6 trillion and IDR6.74 trillion for activities in the economic resiliency sector and specific region sector respectively. Examples of activities at the Directorate General of Water Resources are the irrigation development and embankment maintenance (mitigation co-benefit). The Directorate General of Construction Development has the largest budget of IDR16.2 billion for the support system sector to conduct activities in the form of competence guidance services and construction productivity. The Directorate General of Director General of Social Forestry and Environmental Partnership, Ministry of Environment and Forestry has the largest adaptation budget at the ecosystem sector, amounting to IDR328.5 billion with the largest fund activity in the form of social forestry area preparation. Examples of activities at the Directorate General of Social Forestry and Environmental Partnership are the establishment of social forestry business groups and establishment of an environment and community partnership.

It is mentioned in the Financial Note of 2018 that the implementation of programs in the food sovereignty sector is a form of implementing the 7<sup>th</sup> agenda of Nawacita, which is materializing economic independence by activating the strategic sectors of the domestic economy. The implementation is carried out at the Ministry of Agriculture, Ministry of Marine Affairs



and Fishery, Ministry of Public Works and Housing, and Ministry of Social Affairs. This is in line with the Food Security, which is one of the economic resiliency sub-sectors at the National Action Plan on Climate Change Adaptation and the comparison of budget allocation between the RKP and the result of budget tagging is shown in Table 13.

*Table 13 Adaptation Budget per Sector of 2018*

Implementing Institution	Budget per Sector (Rp.billion)				
	Economy	Livelihood	Ecosystem	Specific Region	Support System
KPUPR	12,557.5	27,202.5		7,245.9	327.8
KESDM	69.6			281.3	
Kementan	231.2				
KLHK			1,122.8		
KKP				87.4	
BIG					7.3
BMKG					139.1
BPPT					37.1
<b>Total</b>	<b>12,858.3</b>	<b>27,202.5</b>	<b>1,122.8</b>	<b>7,614.6</b>	<b>511.3</b>

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

The food sovereignty sub-sector in the economic resilience sector is one of the priorities in the adaptation budget, is in accordance with the Nawacita agenda.

The allocation at the Ministry of Agriculture is carried out through the development and rehabilitation of the tertiary irrigation network as the efforts to improve productivity, particularly at the basic food materials. When compared with the result of budget tagging, it is shown that the budget allocation is at the Directorate General of Agricultural Infrastructure and Facilities, Directorate General of Food Crops, and Agricultural Land Resources Agency with the allocation of IDR231 billion. The allocation at the Ministry of Public Works and Housing is mainly directed to develop/improve the agricultural irrigation network. The result of budget tagging indicates that the Directorate General of Water Resources is the implementing party to achieve such a target at the Ministry of Agriculture. Although the Ministry of Marine Affairs and Fishery is one of the ministries that is engaged in food resiliency in the National Action Plan for Climate Change Adaptation, it has not carried out budget tagging yet, therefore the amount of allocated budget cannot be identified. The Ministry of Social Affairs is not included in the ministries that provide support to the achievement of the food resiliency target in the National Action Plan for Climate Change Adaptation.

### 4.3. How Effective is the Climate Budget Tagging?

One of the functions of the climate budget tagging is being the basis for performance-based budgeting. Proper instruments and assessment indicators are required in the assessment of the budget use effectiveness. Currently, there are no instruments for assessment of the climate change budget effectiveness yet. Nevertheless, indicator

calculations have already been initiated for the mitigation activity, but not for the adaptation activity. The performance-based budgeting needs information systems that combines the types of the mitigation activity and adaptation activity, the amount of budget incurred for such activity, and the change of indicator that is the outcome of such activity.

The Government of Indonesia (GoI) has prepared the tools for the data collection system of the activity, budgeting, and mitigation and adaptation activity achievement indicators, such as KRISNA (Collaboration of Budget Performance Planning and Information), Integrated Performance Monitoring System (SMART), Greenhouse Gas Inventory System (SIGN), National Registry System (SRN), and Vulnerability Index Data Information System (SIDIK). KRISNA is currently managed by the Ministry of National Development Planning (Bappenas), SMART is managed by the Ministry of Finance, and the other instrument systems are managed by the Ministry of Environment and Forestry. The information is available in the KRISNA system related to the mitigation and adaptation activities for each Ministry/Institution and the budget for each activity. SIGN is the inventory system and calculation to both national GHG emission and five sectors that are the main focus of NDC. SRN provides the data and information related to the mitigation and adaptation activities that have been carried out in Indonesia, including the achievement. Meanwhile, SIDIK presents the data related to the climate change vulnerability with the village unit throughout Indonesia that can be used by the government to design the adaptation programs.

Other than that, there are PEP (Monitoring, Evaluation and Reporting), RAN/RAD GRK and Proklam (Climate Village Program). The information related to the RAN/RAD GRK activities is available in the PEP system, including the estimation of the GHG emission reduction achievement from such activity. Through Proklam, the GoI gives awards/appreciation to the community in a certain village that has carried out the sustainable climate change adaptation and mitigation efforts.

The problem of current developed information system, either the electronic based or the manual based, is the non-integration of all data basis, so that it is difficult to make the assessment on the effectiveness of the budget that has been incurred. For example, PEP only contains the information on the mitigation and adaptation activities and emission reduction at the ministry that has been mandated in the National Action Plan on Climate Change Adaptation and only for the activity indicated in such National Action Plan on Climate Change Adaptation. This activity coverage is not similar to what is contained in KRISNA, which only covers the information on activity and budget, without the emission reduction indicator. SRN covers all three, but the mitigation and adaptation activities in SRN are not always similar to what are in PEP and KRISNA. The Government has an important agenda in the synchronization of the data basis in order to support the performance-based budgeting.

In preparing the achievement indicators, it can be said that for the mitigation activity there is already a standard system for assessing the emission reduction achieved by various types of mitigation activity. However, this is not the case with



the adaptation. Although now the adaptation activity achievement indicators in SIDIK has been developed, there is no standardized method and a standard that can be used by each ministry to assess the effectiveness of the adaptation activity that is planned and carried out. Initiation is currently carried out to assess the effectiveness of mitigation activities in several activities, as described below.

The climate change mitigation activity is intended to reduce the GHG emission from the *baseline* condition. Mitigation activity will improve when the GHG emission reduction is higher. Nevertheless, comparison between the mitigation activities without performing standardization may result in mistakes in the decision-making process. The budget or cost of such activity can be used as the standard to result in the amount of GHG emission that can be avoided per rupiah (CO<sub>2</sub>e/IDR). Thus, the policy maker, in this case the line ministry that is assigned to carry out the climate change mitigation, can take into account the climate change mitigation effectiveness in the budgeting of the next activities.

The calculation of the GHG emission reduction from the mitigation activity (or adaptation activity) has actually already been regulated by the Ministry of Environment and Forestry by organizing the Climate Change Control National Registry System (SRN-PI) through the Regulation of the Minister of Environment and Forestry No. P.71/MENLHK/SETJEN/KUM.1/12/2017. SRN-PI is a web-based system for the management and provision of data and information concerning the actions and resources for climate change mitigation and adaptation in Indonesia. The available information covers description of the mitigation/adaptation action, its resources (including whether its budget and financial source are public or private), and evaluation on the result of the GHG emission reduction. In addition to being the information source regarding the climate change mitigation and adaptation action, SRN-PI is also intended to provide recognition to the implementing party that participates in such actions. This causes the climate budget tagging to become very important.

The implementation of activities such as measurement, reporting, and verification of the climate change actions and resources are specifically regulated through the Regulation of the Minister of Environment and Forestry No. P.72/MENLHK/SETJEN/KUM.1/12/2017. In general, the responsible party of the mitigation action will be responsible for all series of activities, from planning to verification. The GHG emission measurement commences from the planning phase where the responsible party of the activity measures the *baseline* emission and the achievement potential/target of the emission reduction. After carrying out the activity, the responsible party then measures the actual achievement. Further on, the result of the activity implementation report is verified by the internal verifier of the Directorate General of Climate Change or external verifier that may be appointed by the responsible party before finally being approved by the minister.

Each ministry has their own method to calculate emission reduction. For example, the Ministry of Energy and Mineral Resources calculates CO<sub>2</sub> emission reduction from the energy that is saved from the operation of the developed Solar Power Plant. Meanwhile, the Ministry of Transportation calculates the CO<sub>2</sub>

emission from the emission from vehicles that is reduced by using trains as the mass transportation, particularly in Java and Sumatera. The method that is used to calculate the emission reduction as carried out by each ministry has no fixed standard. Higher commitment is needed so that the CO<sub>2</sub> emission reduction at each ministry, which is related to the mitigation and adaptation tagging activity, can be simultaneously calculated for evaluation of the target indicated in the National Action Plan on Reductions in Greenhouse Gas Emissions, National Action Plan on Climate Change Adaptation, or NDC.

The output of the application of clean and efficient energy technologies is one of the mitigation actions, which is the energy efficiency carried out through the (1) development of Public Solar Street Lighting, by building public road lighting that is integrated between the lamps and an independent solar power plant for its electricity needs, and (2) increase of the capacity of LED lamps in the existing public road lighting system in order to be more efficient. Based on the above, the GHG emission reduction that can be achieved through such output is shown in the following table.

*Table 14 Result of the Greenhouse Gas Emission Calculation at the Clean and Efficient Energy Technology Application Output*

Procurement Year	Contract Value (Rpbillion)	Retrofit/PJUEfficient		PJUPLTS		Total Emission Reduction (tCO <sub>2</sub> -e)
		Total Points	Emission Reduction (tCO <sub>2</sub> -e)	Total Points	Emission Reduction (tCO <sub>2</sub> -e)	
2016 - Phase I	45.12	1,807	4,067.48	1,260	1,481.61	5,549.09
2016 - Phase II	70.45	2,885	1,905.31	2,378	548.70	2,454.01
2016 - Phase III	46.87	2,630	1,689.69	1,277	295.30	1,984.99
<b>Total</b>	<b>162.44</b>	<b>7,322</b>	<b>7,662.48</b>	<b>4,915</b>	<b>2,325.61</b>	<b>9,988.09</b>

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Meanwhile, in 2016 an example of the CO<sub>2</sub> emission reduction calculation at the Ministry of Transportation was at the Directorate General of Railways. There are three activities at the Directorate General of Railways whose emission reduction has been calculated, namely the utilization of the double track railway across north Java, utilization of the Jabodetabek urban trains, and the developed Trans-Sumatera railroad. In 2016, the Directorate General of Railways made tagging on the mitigation activities amounting to IDR10.18 trillion and succeeded in reducing the emission by 1.541 MT CO<sub>2</sub>, as shown in Table 14. The largest emission reduction was contributed by the utilization of the Jabodetabek urban trains amounting to 0.781 MT CO<sub>2</sub> or 50.68 percent of the total CO<sub>2</sub> emission reduction of the Directorate General of Railways.

One challenging issue is how to take into account the avoided GHG emission from the indirect activities. Activities in the form of physical projects, such as the development of Solar Power Plant, development of transportation systems, and construction of flyovers, the GHG emission for the baseline and its impact can be isolated, so that the calculation and verification become easier.

*Table 15 Result of the Greenhouse Gas Emission Calculation at the Railway Sub-Sector Output*

No.	Activity	Achievement of Emission Reduction (in MT)					Remarks
		2012	2013	2014	2015	2016	
1	Utilization of Double Track Railroad Across North Java	-	-	0.0043	0.546	0.566	-
2	Utilization of Jabodetabek Urban Train	0.0148	0.0144	0.0085	0.698	0.761	-
3	Development of MRTNorth-South	-	-	-	-	-	Not yet Operating
4	Development of LRTBekasi-Cawang, LRT Cibubur-Cawang and LRT Cawang-DukuhAtas	-	-	-	-	-	Not yet Operating
5	Development of Trans Sumatera Railway	-	-	-	0.174	0.194	-
6	Development of Trans Sulawesi Railway	-	-	-	-	-	Not yet Operating

Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

Challenges emerge from indirect activities, such as the drafting of the renewable energy mixture acceleration regulation, environment-friendly technology subsidy, or capacity development activities through training and workshops. Although these activities do not directly reduce GHG emission, these activities provide incentives towards environment-friendly activities, which ultimately reduces the GHG emission. Moreover, the impacts of the subsidy incentive, moratorium, or other regulations, can be larger than the physical project itself. Such actions should be recognized as the climate change mitigation and adaptation actions, although they do not directly reduce GHG emissions.

Ministry of Environment and Forestry has provided facilities/systems in order to measure and monitor the achievement of RAN GRK and RAN API targets. Targets for achieving RAN GRK are measured through emission reductions while for RAN API through reducing vulnerability or increasing resilience. Based on this information, the budget tagging results can be used to provide information on climate change financing needs and is a form of commitment of each technical line ministries in achieving the national target. The responsibility for achieving climate change targets does not only place in Ministry of Environment and Forestry, but each technical line ministries has responsibilities which then need to be evaluated with clear performance indicators. In the future, through integration and synergy between budget tagging with SRN, PEP and others, this budget tagging initiative is expected to be used in efforts to strengthen the quality of spending more effectively and productively from each line ministries in achieving national development targets and the effectiveness of handling strategic issues related to climate change.

## 4.4. Identification of Current Funding Adequacy

The result of the climate budget tagging can be made as one of the databases to analyze whether the public funding for the current climate change control has already complied with the funding needs in order to fulfill the NDC target.

As mentioned earlier in section 2.3, a total funding of IDR3,307.2 trillion is needed to achieve the NDC target for 2018-2030 (estimation in BUR 2018<sup>48</sup>). If an annual average is made, then the estimated funding needs for climate change are around IDR288.4 trillion per year.

Based on the analysis of the results of Climate Budget Tagging, the total budget allocation for climate change activities has continued to increase over the past three years. However, in particular, the allocation of mitigation activities has decreased, namely IDR95.6 trillion in 2017 to IDR72.2 trillion in 2018. The climate change budget allocation in 2018 reached IDR109.7 trillion, growing positively by 14.7 percent from the previous year and 51.1 percent compared to 2016.

When compared with the average annual estimated climate change funding needs mentioned in BUR 2018 (around IDR288.4 trillion per year), it can be said that the amount of the climate change budget allocated is still below the estimated climate change funding needs, which around 38 percent of the estimated value. Even then, with a note that the 2018 BUR funding estimate seems to only count on climate change mitigation activities<sup>49</sup>. In other words, when viewed more specifically, the 2018 climate change mitigation budget allocation is still only around 25 percent of the estimated needs.

By utilizing the data of the budget tagging result, it could be observed that the current available public funding allocation for the climate change is still insufficient to fund the climate change mitigation and adaptation activities. Especially for adaptation activities that need very large funding. The results of climate change budget marking only provide information on central government budget allocations for line ministries that have a mandate for mitigation and adaptation activities. Thus, information about existing funding is still only accommodating public funds that come from the government budget.

As explained in the previous section, the budget marking mechanism is one of the tools used by the Government (in this regard the Ministry of Finance) to map the current public financing (state budget) related to climate change activities. However, climate change funding needs certainly cannot be fulfilled simply by relying on public funding. Therefore, the analysis of this climate budget tagging result can be made as the basis to optimize the public funding and mobilize the non-public funds in order to comply with the funding needs.

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48 The projected funding needs at BUR are based on existing government budget data (public funds) (baseline data for 2012-2016), and take into account estimated funding needs for specific activities in the waste sector and IPPU, which are usually carried out by the private sector.

49 Estimasi target penurunan emisi GRK untuk lima sektor (lihat kembali Tabel 4)



At present, the analysis of Climate Budget Tagging results has been utilized in the process of identifying potential projects to obtain funding from green sukuk issuance. Going forward, the analysis of the budget tagging results can also be utilized for mobilizing other public funding through various instruments, including a transfer scheme from the center to the region such as balance funds (DAU, DBH, DAK), village funds, regional incentive funds; and through the provincial to district/city transfer instrument scheme (ecological fiscal transfer).

Furthermore, funding from the private sector through banking instruments, capital markets and securities also needs to be maximized to attract funding from both domestic and international sources, to meet the funding needs for climate change activities.

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## IMPLICATION OF POLICY AND AGENDA AHEAD

There are several policy implications resulting from the analysis on the climate change funding development status and the climate budget tagging. There are three main implications to be clarified, (1) sharpening of the government's role in the climate change financing; (2) establishment of a public funding framework for climate change; and (3) optimization of budget tagging results for climate change. This part will also be closed with the future agenda, which is the conclusion of what should be done by the government in the short, medium and long terms.

### 5.1. Sharpening of Government's Role in the Climate Change Funding

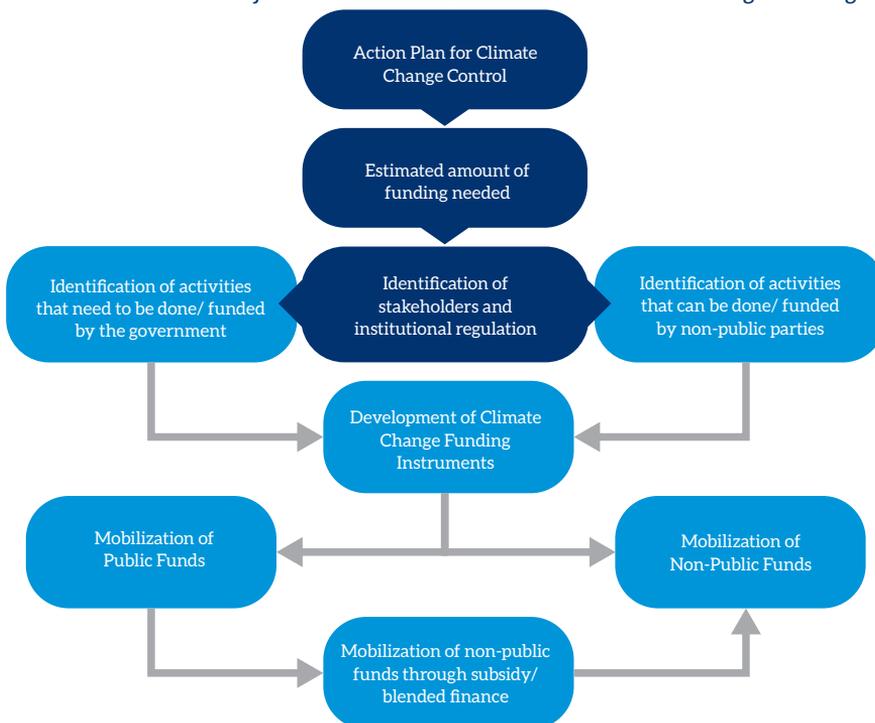
The public funding is dominated by the state budget, particularly in the developing countries, and in general is insufficient to fund the overall mitigation and adaptation activities that have been planned in the national action plan. Although the benefits of climate change control are public, there is always the possibility that a non-public party (for example the private sector) provides the contribution, either due to the nature of the activity that complies with the project's financial feasibility criteria (for example the renewable energy generator project) or due to its social and community responsibility (CSR).

The government is assigned to draw up the climate change action plan, which nationally provides guidance related to the mitigation and adaptation actions in order to respond to the climate change challenges in such country. The mitigation and adaptation activities require the role of the stakeholders, either from the government, private sector, NGOs, university and research institutions, as well as the community at large. With regard to the government function in coping with market failure, the government may focus on activities that other parties are unwilling to carry out. In addition, the government also has the role of mobilizing non-public funds, one of which is with subsidies or capital participation through blended finance in order to mobilize funds from the private sector. One of the instruments is the viability gap fund, the participation of funds to develop a project that produces high social benefit to become business worthy.

The government function in public funding may also be called a “residue” function for carrying out matters that cannot be done by other parties. Therefore, the government needs to look at the potential role of other parties in the national mitigation and adaptation agenda, so that in the future the government can handle the “remainder”. The roles of other parties are also dynamic between times, and there is the possibility that there are activities that are currently not yet business worthy but can be carried out by the private sector in the future. Therefore, the role of the private sector may be evaluated between times and this may reduce the burden of the government at the climate change funding in the future. The public fund management needs to be directed towards optimizing public welfare, therefore the mobilization function becomes important. In general, the government intervention in the climate change funding is explained in Illustration 19. The analysis in illustration is developed from Bird and Granoff (2016).

In order to mobilize funding sources for climate change, it is important to make an estimation on the amount of budget required. The estimation of the funding amount should provide adequate information on the needs of sectoral funding. Such estimation should also be based on the most effective and efficient methods of program/project implementation. The estimation must be renewed regularly in order to take into account any changes in the unit cost or more effective and efficient activity implementation methods. Making an estimation of the climate change funding amount in the future is not simple and must engage various stakeholders and experts who are related to the mitigation and adaptation sector.

*Illustration 19 Flow of Government Intervention in the Climate Change Funding*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)



Stakeholder mapping in the activities, including drafting the institutional framework, needs to be carried out. The mapping is done in order to find the actors who act as regulators, coordinators, and implementers of the activities. Thereafter are the description of duties and functions of each key actor, and the mapping of incentive that is obtained by each stakeholder. The sense of belonging of each stakeholder needs to be developed, especially the key actor, as well as the awareness toward the institution management that will direct the activity's priority at such institution and the preparation of regulations as its authority.

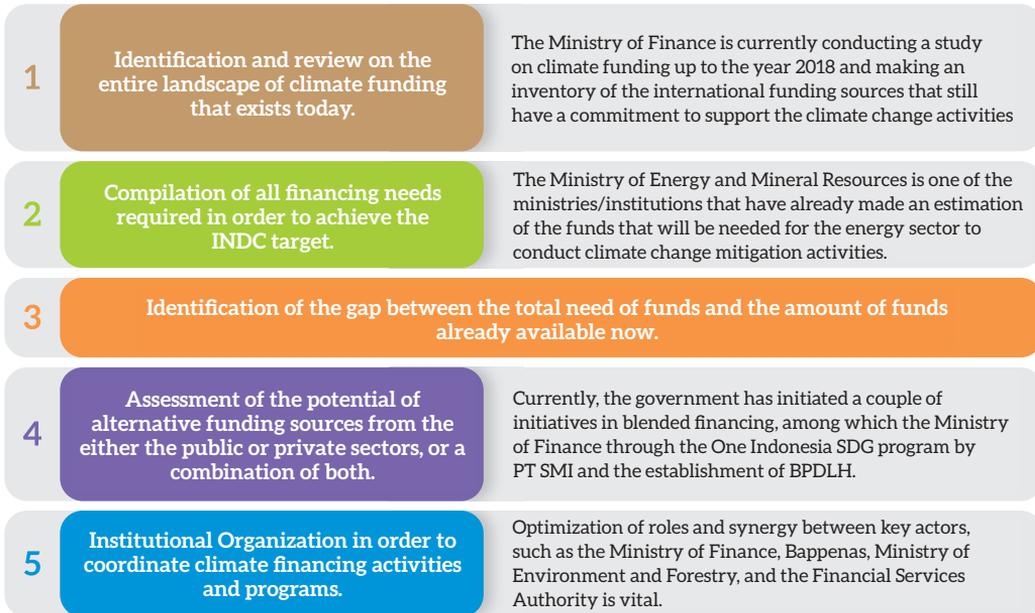
The identification of actors who can support the climate change activity, including the funding, is needed to identify the roles of the public and non-public institutions. The national mitigation and adaptation plan need to be distributed down to the regional level and the divided action plan per sector becomes the basis to share the roles and responsibilities on who implements the activity and who funds them. The government needs to carefully identify parts that can be funded purely by the non-public party, parts that need funding participation from the government, and parts that are unable to be funded by the non-public party. The identification of actors includes actors who are currently engaged in the climate change funding and their roles and potential for the improvement of the role of each actor. It is also possible to identify other actors who have the potential to be further engaged in the climate change funding.

The identification of roles of actors who are currently engaged in the climate change funding includes estimating the funding amount/contribution that has been made. This can be the initial assessment on the current funding status to further on become the basis of the sustainable evaluation in the future. The estimation of total funding that is currently provided by each actor also becomes the basis to calculate the estimation of fund shortage (finance gap) for the climate change at the national level. This estimation of the finance gap can become the basis to draw up the incentives/disincentives policies at the sector level and financial service institutions, particularly the financial institution to encourage the non-public sector to move toward the direction of achieving the targeted mitigation and adaptation plan. This finance gap estimation will also be very useful in determining the most effective and efficient funding scheme, and in developing a more innovative, new type of funding instrument. In the website of *Financing Solutions for Sustainable Development*<sup>50</sup>, the UNDP provides a list of very diverse financial solutions to be developed as the climate change funding source. The adaptation of each offered financial solution certainly needs to consider the special characteristics of each country.

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50 [http://www.sdfinance.undp.org/content/sdfinance/en/home/solutions.html?main-content\\_columnControl\\_col-1\\_list\\_start=0](http://www.sdfinance.undp.org/content/sdfinance/en/home/solutions.html?main-content_columnControl_col-1_list_start=0)

### Illustration 20 Activities that are needed in the Framework of the Climate Fund Mobilization



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

For the government, this estimation of the finance gap will be the basis to draft the green budget projection annually. The allocation and evaluation of the budget are not only in order to comply with the funding target, which is sourced from the government budget, but also for the non-public fund, since the mandate of the government is to ensure the fund availability in order to organize climate change activities. In order to support sustainable funding allocation that is coherent with the climate change action plan at the national level, the budget tagging mechanism is needed for the mitigation and adaptation activities, or activities that provide benefits from both aspects (*co-benefit*). The mitigation and adaptation budget tagging is also very useful to evaluate the cost-effectiveness of an activity, which ultimately supports performance-based budgeting. In addition, the evaluation on the mitigation and adaptation budget allocation needs to be carried out per sector, and show the spatial evaluation that provides the information where such activity is carried out. The spatial evaluation can be carried out with the location-based budget tagging (*geo-tagging*). The budget tagging activity may be said as a crucial tool in order to be able to evaluate the commitment of a country toward the climate change activity in accordance with the plan.

## 5.2. Designing the Framework of Public Climate Change Funding

In order to ensure the achievement of the national target for the climate change control, the Government of Indonesia needs to prepare the public funding framework for climate change (Climate Change Fiscal Framework/CCFF). Several



countries have already drawn up a similar document, such as Bangladesh<sup>51</sup>, Nepal<sup>52</sup>, and Cambodia<sup>53</sup>. CCFF can be developed in Indonesia from several documents that have been published before, such as the Indonesia Mitigation Fiscal Framework and Climate Public Expenditure Review, which has been carried out by several provinces, such as Jambi, Yogyakarta and East Nusa Tenggara, and the Guidance of Climate Budget Tagging<sup>54</sup>.

Indonesia has an interest to draft the CCFF with regard to its benefit on the following matters:

1. CCFF is the fiscal framework that can accommodate the national priority with the fiscal system and mechanism that conforms to what have been developed in Indonesia.
2. CCFF is able to encourage the climate change activity and funding harmonization among the government, private sector and other non-public parties (NGO and others).
3. CCFF encourages climate fund management accountability, which will increase the effectiveness of organizing the climate change action at the national or regional level.
4. CCFF expands the opportunity to improve the green sector-based growth, which is resistant to climate change.
5. CCFF enables the performance of the integrated planning and budgeting cycle, including supporting the *performance-based budgeting* at the climate change sector.

The preparation of the public funding framework for climate change must observe several aspects, namely the funding phase, the principle needed for each funding phase, and the criteria for each principle (Schalatek and Bird, 2018). In this case there are three phases, namely the fund mobilization phase, administration and institutional/governance strengthening phase, and fund distribution and program implementation phase. Illustration 21 explains in detail the principles and criteria for each phase.

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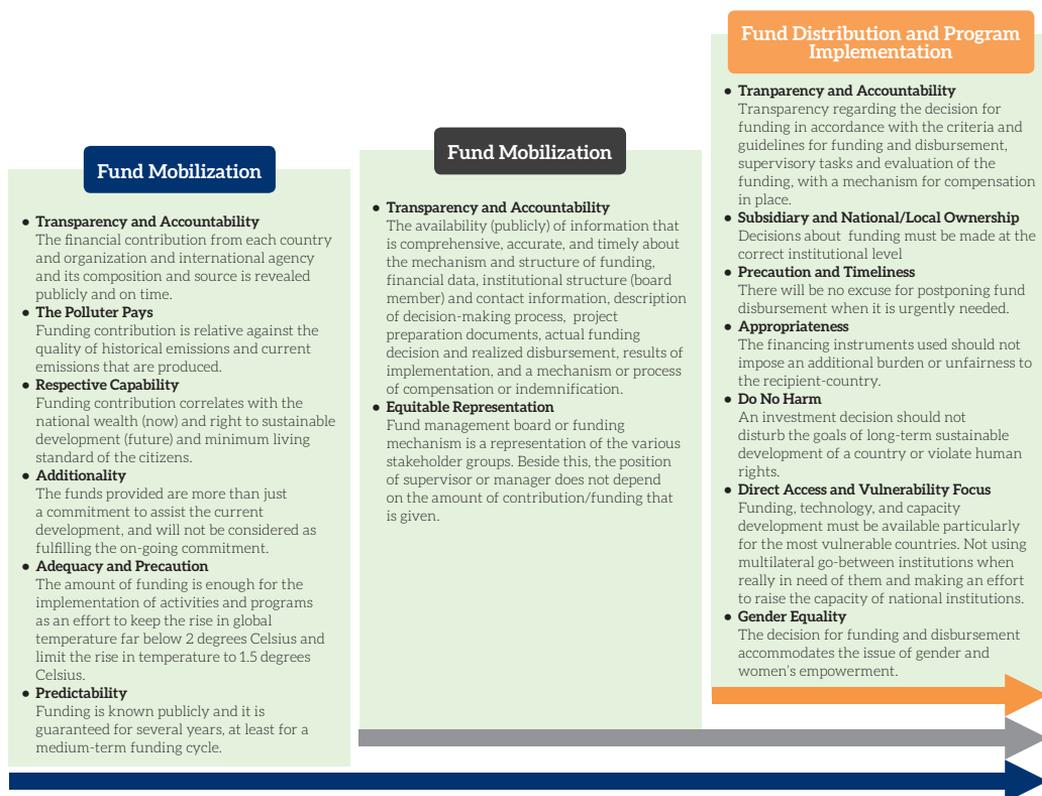
51 [https://info.undp.org/docs/pdc/Documents/BGD/1695%20ClimateChange\\_FullLayout%20290914.pdf](https://info.undp.org/docs/pdc/Documents/BGD/1695%20ClimateChange_FullLayout%20290914.pdf)

52 [https://mof.gov.np/uploads/document/file/CCFF\\_FINAL\\_Web\\_20180222050438.pdf](https://mof.gov.np/uploads/document/file/CCFF_FINAL_Web_20180222050438.pdf)

53 <http://www.camclimate.org.kh/en/documents-and-media/library/category/135-climate-change-financing-framework-ccff.html?download=706:climate-change-financing-framework-full-report-en>

54 Governance of Climate Change Finance in Indonesia - <https://www.climatefinance-developmenteffectiveness.org/countries/indonesia>

## Illustration 21 Principles and Criteria of the Public Funding for Climate Change



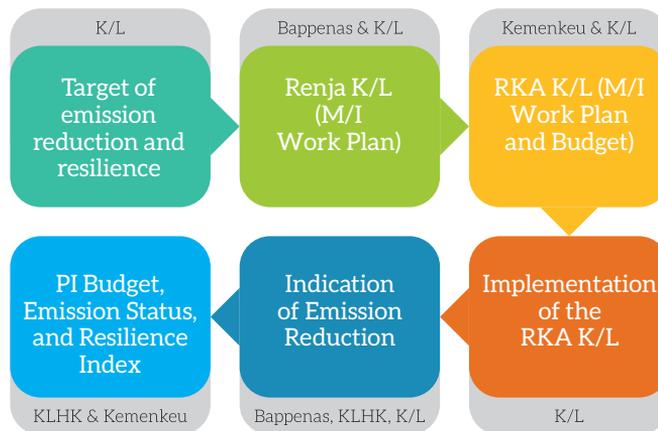
Source: Schalatek & Bird (2018)

The preparation of CCFF should observe the existing budgeting cycle in each country, since one of the objectives of CCFF is mainstreaming the climate change into the government budgeting. The public funding in Indonesia originates from domestic and international sources. Some of the public funding from these two sources are through the implementing country budget mechanism (*on-budget*) and/or recorded in the government financial system (*on-treasury*). In addition, there are recorded funds but they are not channeled into the national budgeting system (*on-budget off-treasury*). Beside that, there are funds from international sources that are not coming in and not recorded by the government (*off-budget off-treasury*), that is provided directly by the donor country/institution to the non-public implementing institution. Besides the first mechanism, other mechanisms are generally missing from the climate change funding analysis of the public sector. Therefore, the correct mechanism is needed for accurate public fund data collection for the climate change. In addition, the funds originating from the donors need to be well coordinated so that there is no multiplication of unnecessary activities that causes inefficiency. Such activity also needs to be coordinated so that it is coherent with the national priority.



The public funding source that originates from the government budget is carried out through the running budget allocation mechanism, both for the central ministries/institutions and the Local Government. The allocation of funds for climate change activity that is sourced from the government budget follows the national planning and budgeting mechanism, as is reflected in Illustration 22. The target of GHG emission reduction and resilience against climate change in the form of climate change mitigation and adaptation actions are translated into the Ministry/Institution Work Plan (Renja K/L) in the form of programs and activities as well as outputs in the Ministry/Institution Work Plan and Budget (RKA K/L). The implementation of each output that gives an indication of GHG emission reduction and increase of resiliency against the climate change is the climate change budget of the on-going year. The condition today still faces several challenges, and it is still difficult to determine whether the program, activity, and output contained in the Renja K/L and RKA K/L are correctly or not reduced from the emission reduction target and resiliency and with correct calculation of indicators. This is important to ensure that later on during implementation it can be directly translated into an indication of emission reduction.

*Illustration 22 Climate Funding in the Planning and Budgeting System*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

### 5.3. Optimization of Utilizing the Climate Budget Tagging

The budget tagging plays a quite crucial role in the climate-friendly planning and budgeting process. Currently, the results of budget tagging are not fully optimized by the government, either by the technical line ministries as the activity implementation key actor, the Ministry of National Planning/Bappenas as the important actor of the climate change action planning, Ministry of Environment and Forestry as the focal point of the climate change action at the national level, or the Ministry of Finance as the fiscal management authority. The minimum utilization of the budget tagging result is also caused by the currently used system and mechanism that do not support an efficient tagging process, valid and accurate

budget tagging result, as well as regulations that do not encourage the stakeholders to optimally utilize the budget tagging result.

Following are several matters that are the key agenda to optimize the climate budget tagging result:

**1. Mainstreaming of climate change issues into planning and budgeting activities at the Line Ministries' level**

The identification of climate change activities must start from the preparation of development programs and activities through the marking the outputs of activities, so that efforts to mainstream climate change can be carried out. These efforts intend to achieve climate change targets in line with development goals.

Therefore, increasing the sense of ownership of each line ministries towards the responsibility of reducing emissions is needed, not only at the echelon 1, 2, 3 level, but also technical staff working units implementing activities related to climate change mitigation and adaptation. This is needed so that each related work unit can prepare a plan of activities accompanied by clear and measurable outputs and emission reduction indicators. The related work units can also allocate budget proposals, adjusted to the urgency and impact of these activities on achieving national emission reduction targets. Understanding of climate change mitigation and adaptation issues should also be held by technical staff implementing budget tagging activities.

In mainstreaming efforts through budget tagging activities, there are two main issues faced by line ministries, namely the limited capacity of implementing human resources related to climate change mitigation and adaptation activities, and the mechanism for deriving action plans into ministry's activities.

- The need to increase the human resources capacity of line ministries implementing climate change budgeting.

The quality of activities arranged by line ministries is very dependent on the understanding of the importance of the impacts of climate change, such as planning activities that must be carried out to tackle climate change and giving priority to certain activities that need to be prepared to plan programs related to climate change. With this understanding, not only the proposed activities will have more quality, but also the activities can appropriately tackle climate change issues and improve the quality of budget marking results because the related line ministry's human resources already understand the types of activities that are categorized as mitigation and adaptation. The tagging process not only requires an understanding of mitigation and adaptation, but also synchronizes with the national action plan on climate change mitigation and adaptation. Current state also requires line ministry's human resources to understand activities that produce co-benefits or activities that provide mitigation benefits as well as adaptation simultaneously. At present the understanding of the implementing line ministry's human resources on this subject is vary and this will affect the quality of the budget tagging data which will be very



useful for planning future activities. Therefore, it is necessary to improve the quality of line ministry's human resources to increase understanding related to climate change mitigation and adaptation.

- The need for a clear mechanism in deriving the action plan into line ministry's activities.

To provide a reference for line ministries in identifying development activities in the energy, forestry, agriculture, waste, and Industrial Processes and Product Use (IPPU) sectors related to mitigation, Ministry of Environment and Forestry has prepared a guidebook for determining climate change mitigation actions. The guidebook explains the outputs of activities that can contribute directly (core activities) and indirectly (supporting activities) in reducing GHG emissions/increasing carbon stocks. The next stage that is needed is to use the manual in the development planning process, such as in a trilateral meeting. Through this process, marking the output of climate change activities which are national development activities, can be identified in the KRISNA System as part of the thematic marking of the state budget.

There are several issues in the implementation of budget marking that can result in suboptimal use of the results. One of them is the issue regarding the application of pre-tagging. At the beginning of its implementation (in 2016 and 2017), budget tagging was carried out at the Line Ministry's Work and Budget Plan (RKA-K/L) stage after the determination of indicative ceilings in DIPA or post-tagging. In 2018, budget tagging started using the pre-tagging mechanism, namely at the Line Ministry's Work Plan (Renja K/L) stage, after the trilateral meeting. Evidently, this has shown this has shown that the mechanism is getting better because the budget tagging is carried out while the budget discussion is ongoing, making it possible to reallocate to ensure optimal budget allocation related to the suitability of the national climate change action plan, by evaluating the most relevant, effective, and efficient programs to do. However, future programs would benefit if the budget tagging was carried out at an earlier stage, namely before the determination of the indicative ceiling and the determination of sources of financing. This is done to achieve the target of handling climate change by considering various alternative sources of financing (state budget, sovereign Islamic securities, etc.).

## 2. The Development of a Measurement Instrument for Effectiveness of the Climate Change Budget

Furthermore, in terms of measuring the impact of the budget, the results of output-based budget tagging currently cannot provide detailed information on the quantity of GHG emissions that can be derived from each tagged climate change activity. Therefore, it is necessary to initiate instruments that are supported by an adequate system in order to make the budget tagging mechanisms' effectiveness evaluable. By linking the budget to performance indicators, activities that are most effective in reducing emissions or increasing climate resilience can be seen. Currently the Directorate General of Climate

Change in the Ministry of Environment and Forestry, there is a Directorate of Greenhouse Gas Inventory and Monitoring, Reporting and Verification, that performs the MRV function of reducing emissions from line minister's activities mandated in the RAN GRK which then becomes the basis for reporting to UNFCCC. However, this effort is not integrated with budget tagging yet. The next challenge is to develop appropriate performance indicators of adaptation activities. In addition, the government also needs to ensure that the output units of the activities carried out can be converted into performance indicator units, for example the mega-watts of Solar Power Plant that are built will be able to provide estimates of the amount of emissions reduced from Solar Power Plant development activities. This impact measurement can help the Government of Indonesia in three ways, namely: 1) tracking how far the GHG emission reduction has been achieved against the international commitments made by the Government of Indonesia, 2) identifying the effectiveness of GHG reduction from each activity carried out by relevant ministries and implementing agencies, and 3) carry out a national GHG inventory documented in the National Greenhouse Gas Inventory System (SIGN).

### **3. Improvement of the Climate Budget Tagging Procedure**

Budget tagging procedures and institutions also still need to be improved. At present there is a procedure for tagging the climate change budget that has been socialized to the related line ministries. Even so, there are still differences in the implementation mechanism at the line ministry level regarding parties who have to tag and standardize the categories/definitions of mitigation and adaptation, as well as those who have to verify the results of the tagging. Going forward, this procedure needs to be refined to include the duties and responsibilities of each function including by whom and how verification is carried out. This is important to obtain quality tagging results, with high reliability and validity. This procedure also needs to be developed for budget tagging at the provincial and regency/city levels.

### **4. Integration of the KRISNA, SMART, SRN and PEP Systems**

The national development planning and budgeting process has currently been integrated into the KRISNA System, making it easier for the Ministry/ Institution to identify the climate change output through the budget tagging. There are several systems that can be used to support the budget tagging process, among others the Integrated Performance Monitoring System (SMART), Monitoring System, Evaluation and Reporting (PEP) of National Action Plan on Greenhouse Gas Emissions Reduction and Sub-National Action Plan on Greenhouse Gas Emissions Reduction, as well as the National Registry System (SRN). The integration between those three systems may assist in the transparency process, improve the accuracy, reduce the inconsistency, and the data renewal at the climate budget tagging at the KRISNA system. In addition, such integration can materialize the standardization of the climate change mitigation action financing need (abatement cost) or the climate change adaptation (incremental cost).



## 5. Expansion of the scope of Climate Change Tagging

The climate change tagging is currently only carried out by the Ministries/Institutions mandated by the National Action Plan on Reductions in Greenhouse Gas Emissions (RAN-GRK). A part of the mandated Ministries/Institutions that are mandated by the National Action Plan on Climate Change Adaptation (RAN-API)<sup>55</sup> have not yet carried out the adaptation budget tagging. Apart from the mandated Ministries/Institutions, there is the opportunity that other Ministries/Institutions carry out the mitigation or adaptation activity or which is co-benefit. The expansion of the Ministry/Institution scope needs to be considered since the limitation of the Ministry/Institution will make the budget tagging result smaller than it should be (underestimated). With regard to the activity scope, clear definition and categorization need to be drawn up for the mitigation and adaptation activities, including opening the opportunity to tag the existing activities outside the National Action Plan on Reductions in Greenhouse Gas Emissions/National Action Plan on Climate Change Adaptation<sup>53</sup>. The expansion of other budget tagging scope is the budget tagging at the provincial and regency/city levels. There are currently already several initiations of several provinces, such as Jambi, West Kalimantan, and regencies/cities, such as West Kutai Regency and Wakatobi Regency in carrying out the budget tagging. This needs to be encouraged in the future by regulations and other instruments so that the climate budget tagging can be carried out for all areas until the lowest administrative level (for example the village fund).

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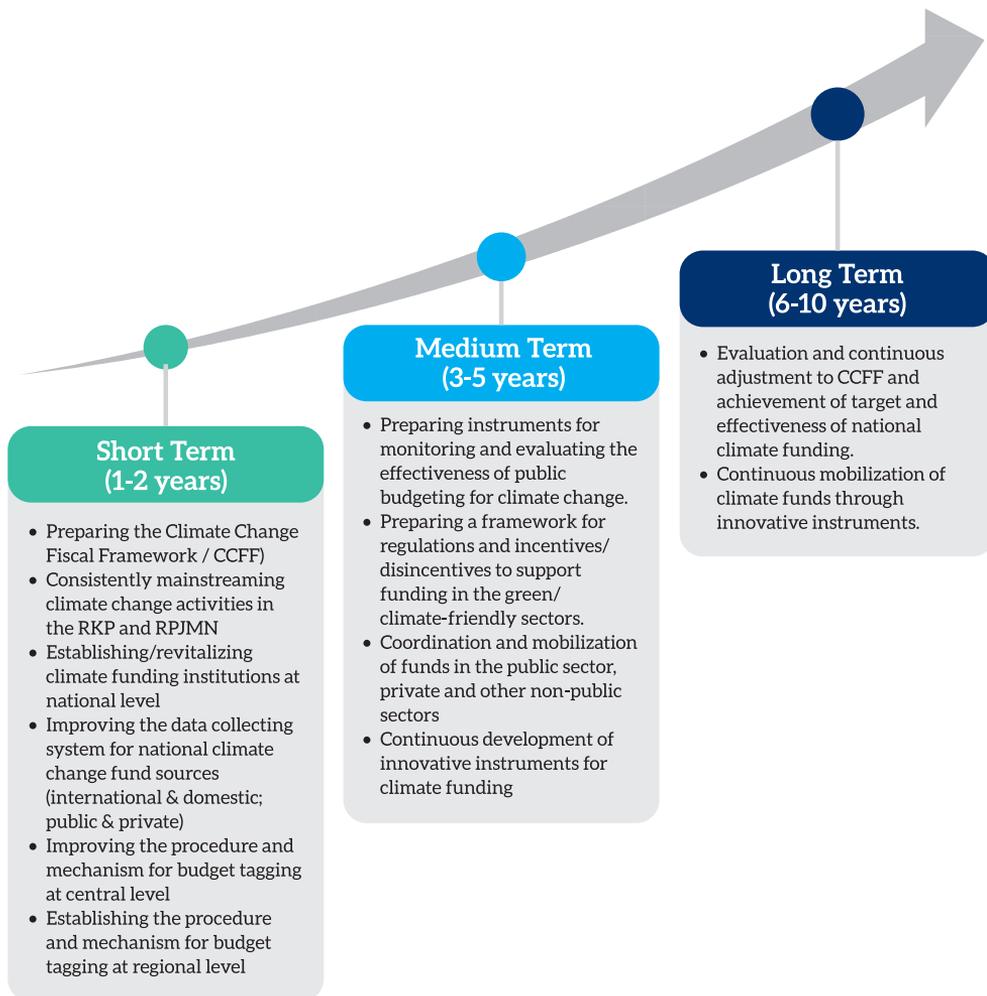
<sup>55</sup> Although this expansion of the activity coverage is able to increase the amount of the climate change budget as result of tagging, there are several debates on activities, such as the gas sourced energy and clean coal in the emission reduction. Both matters are supported by the Nationally Determined Contribution but not by the United Nations Framework Convention on Climate Change

## 5.4. Next Agenda

With regard to the progress made by the Government of Indonesia, in particular the climate change budget management and mobilization, various obstacles are still found that obstruct the effectiveness of the climate change target achievement.

The following is the framework and timeline that need to be carried out by the government in order to support the climate funding compliance for achievement of the climate change target.

*Illustration 23 Agenda of Climate Funding in the Future*



Source: Fiscal Policy Agency, Ministry of Finance (Processed Data)

This book is intended to provide a snapshot of the framework, status and development of the public funding for climate change in Indonesia. The vulnerability of Indonesia toward the climate change impacts causes the significance of the efforts of the government to cope with the climate change at the national or international level through its role in various global climate change conventions. With a significant need for funding, the government faces challenges to enhance and optimize the utilization of the climate change budget through the development of various alternative instruments as well as the implementation of the *performance-based budgeting*. In addition, the effort is also needed to mobilize fund from private and other non-public sources. In order to support the green planning and budgeting in the framework of mainstreaming the effort of the climate change management in the budget system, the effort that is carried out by the Ministry of Finance through the budget tagging needs to be followed up with more comprehensive actions, namely the preparation and implementation of the climate change fiscal framework that provides the signal and direction to all national climate tagging key actors to jointly move synergistically in the climate funding in order to achieve the national target and to support the global target achievement.

With regard to the public funding for climate change in Indonesia, the important matter to be carried out is to integrate the climate change action into the development planning at the national and local levels. Formidable planning will be reflected in the correct budget allocation and continuous monitoring and evaluation system in order to ensure the budget efficiency and effectiveness. Strong coordination between the key institutions as the regulators and the executive institutions as the implementers is strongly needed in order to accelerate and synergize various climate change programs.

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# APPENDIX

Annex 1. Mapping of Impact Potential from Global Warming

Sector	Form of Risk	Scale of risk caused by global warming	
		1,5°C above pre-industrial level	2°C above pre-industrial level
Clean water	Water scarcity	Total individuals who will experience water scarcity increased by 4 percent of the world population in 1999	Total individuals who will experience water scarcity increased by 8 percent of the world population in 2000
	Overflow flood	Total population to be impacted is 100 percent more compared to the period of 1976 - 2004	Total population that will be impacted is 170 percent more compared to the period of 1976 - 2005
	Drought	There is an addition of 350.2 ± 158.8 million city population who will be exposed to severe drought	There is an addition of 410.7 ± 213.5 million city population who will be exposed to severe drought
Land ecosystem	Disappearance of biodiversity	6 percent of insects, 4 percent of vertebrata, and 8 percent of flora	18 percent of insects, 8 percent of vertebrata, and 16 percent of flora
	Disappearance of ecosystem	Probability: average	Probability: high
	Change of biome <sup>55</sup>	Around 7 percent of biome will transform	Around 13 percent of biome will transform
	Forest fires	Probability: high	Probability: high
Ocean	Disappearance of coral reefs	Probability: very high	Probability: very high
	Disappearance of seaweed	Probability: average	Probability: high
	Disappearance of mangrove	Probability: average	Probability: average
	Disturbance on food chain at sea	Probability: high	Probability: very high
	Migration of sea biota	Probability: average	Probability: high
	Disappearance of several fish species	Probability: high	Probability: high/very high
	Disappearance of beach ecosystem	Probability: high	Probability: high/very high
	Disappearance of shellfish species	Probability: average/high	Probability: high/very high
	Physiological and ecological change of sea species	Probability: low/average	Probability: average

<sup>55</sup> Biome is an ecosystem with wide coverage area containing specific flora and fauna.

Sector	Form of Risk	Scale of risk caused by global warming	
		1,5°C above pre-industrial level	2°C above pre-industrial level
Ocean	Expansion of hypoxia death zone	Probability: low	Probability: low/average
	Change of <i>upwelling</i> <sup>56</sup> productivity	Probability: low	Probability: low
	Damage of human living infrastructures at the beach	Probability: high	Probability: high/very high
	Disappearance of habitat of several species	Probability: high	Probability: very high
Sea shore	Increase of seawater level	Around 562–575 km <sup>2</sup> of area is impacted	Around 590–613 km <sup>2</sup> of area is impacted
		Around 128–143 million people will be impacted	Around 141–151 million people will be impacted
		Around 2–28 million people per year has the potential to be impacted if there is no renewal of the 1995 model	Around 15–52 million people per year has the potential to be impacted if there if there is no renewal of the 1996 model
Food security	Change of ecosystem production	Probability: average/high	Probability: high
	Change of biome	Probability: average/high	Probability: high
Human health	Death related to high temperature	Probability: average	Probability: average/high
	<i>Heat stress</i> <sup>57</sup>	Probability: average	Probability: average/high
	Death related to ozone	Probability: average	Probability: average/high
	Malnutrition	Probability: average	Probability: average/high
Key economy sector	Impact on tourism (for example: beach and snow sport)	Probability: average/high	Probability: high

<sup>56</sup> Upwelling or usually translated as sea mass reversal is the phenomenon of seawater mass increase from the deep sea layer to the surface. This water mass movement mobilizes water with higher salinity level and nutrient content to the sea level layer. In general, this upwelling process also contributes to the increase of fishery production at a waters area.

<sup>57</sup> Heat stress occurs when the cooling process of a human body is unable to maintain the body temperature at the normal level (around 37°C) when exposed to a very high external temperature.



Annex2. Participation of the Government of Indonesia at the International Climate Change Convention

No.	Name of Conference	Time and Place	Important Resolutions	Form of Contribution of the Government of Indonesia
1.	UNFCCC COP-3	1997 in Kyoto, Japan	<p><b>Kyoto Protocol</b></p> <ul style="list-style-type: none"> <li>✓ Determined 37 industrial countries in the world and the European community (categorized as Annex I countries) to reduce their GHG emission by 5.2 percent compared to 1990.</li> <li>✓ Article 11 of Kyoto Protocol: advanced countries should provide the financial source to developing countries in order to bear the emerging costs from the GHG emission reduction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Indonesia is included in the group of <i>Non-Annex I</i> countries.</li> <li>▪ The Government of Indonesia has officially ratified the Kyoto Protocol through the enactment of UU Number 17 of 2004 concerning Ratification of <i>Kyoto Protocol to The United Nations Framework Convention on Climate Change</i>.</li> </ul>
2.	UNFCCC COP-13	2007 in Bali, Indonesia	<p><b>Bali Road Map</b></p> <p>Formulated the long-term plan to create better climate, such as:</p> <ul style="list-style-type: none"> <li>✓ <i>The Reducing Emission from Deforestation and Degradation (REDD) Initiative.</i></li> <li>✓ <i>Bali Action Plan</i>, which requested the developing countries to also contribute in coping with global warming through four foundations, namely mitigation, adaptation, technology and funding.</li> <li>✓ 6/CP.13 Resolution related to review on the financial mechanism of the developing countries group.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Indonesia is the host in organizing UNFCCC COP-13.</li> <li>▪ <i>Bali Action Plan</i> placed the important role of Indonesian forest through the implementation of the REDD+ scheme.</li> </ul>
3.	UNFCCC COP-15	2009 in Copenhagen, Denmark	<p><b>Copenhagen Accord</b></p> <ul style="list-style-type: none"> <li>✓ Strong political will is needed from each country to carry out the climate change mitigation or adaptation measures in accordance with the capability of each country.</li> <li>✓ The fund provision facility of approximately 30 billion US Dollars for the period of 2010 - 2012 shall be provided by advanced countries in order to support the perfection of the resiliency improvement effort toward the climate change in the developing countries, such as REDD+, adaptation, technology transfer, and capacity improvement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Indonesian delegation was able to put forward the marine issue in one of the negotiations related to adaptation.</li> </ul>

No.	Name of Conference	Time and Place	Important Resolutions	Form of Contribution of the Government of Indonesia
4.	UNFCCC COP-21	2016 in New York, United States of America	<p><b>Paris Agreement</b></p> <ul style="list-style-type: none"> <li>✓ The main target in the Paris Agreement is to keep the global warming below 2°C of the level at the time of the Industrial Revolution and achieving the effort to limit the temperature change until at least 1.5°C.</li> <li>✓ Article 9 of the Paris Agreement: <ul style="list-style-type: none"> <li>- The advanced countries shall provide the financial resources to support the developing countries or their continuation of the mitigation and adaptation actions that are mandated in the Paris Agreement;</li> <li>- Other parties are encouraged to provide similar financial support voluntarily;</li> <li>- The provision of financial support is expected to be able to adjust the mitigation and adaptation programs to the need of the targeted developing countries, particularly countries that are extremely vulnerable toward the impacts of climate change, and countries with significant resource limitation.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ The Government of Indonesia, which was at that time represented by the Minister of Environment and Forestry, is included as one of the 175 signatory countries of the Paris Agreement.</li> <li>▪ The Government of Indonesia has officially ratified the Paris Agreement through the enactment of UU Number 16 of 2016 concerning Ratification of the Paris Agreement to The United Nations Framework Convention on Climate Change.</li> </ul>
5.	UNFCCC COP-23	2018 in Katowice, Poland	<p><b>Katowice Package</b></p> <p>Preparation of technical instructions to implement the Paris Agreement.</p> <ul style="list-style-type: none"> <li>✓ The international community is willing to annually prepare the funding of around 100 billion USDollars commencing in 2020 in order to assist the developing countries in reducing the vulnerability toward the climate change.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Government of Indonesia responded to the agreement the Katowice Package with the NDC renewal plan and preparation of the emission reduction long term plan until 2050.</li> </ul>

Source: Muchtar, et.al (2012) and *International Affair*



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