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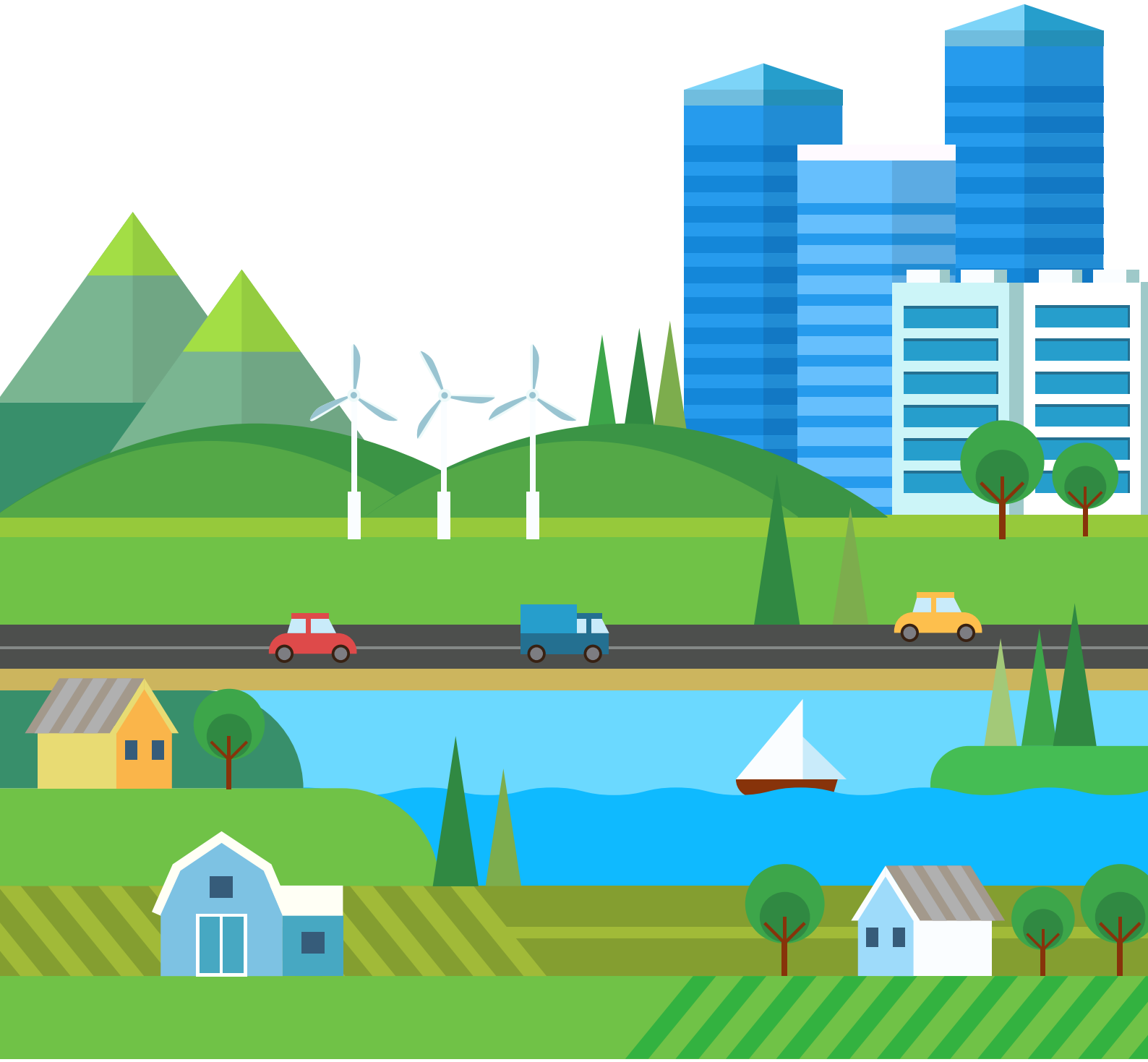

INDONESIA'S TRANSITION TO A GREEN ECONOMY –

A STOCKTAKING REPORT

UN environment · ILO · UNDP · UNIDO · unitar

The report is published as part of the Partnership for Action on Green Economy (PAGE) – an initiative by the United Nations Environment Programme (UNEP), the International Labour Organization (ILO), the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO) and the United Nations Institute for Training and Research (UNITAR).

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EXECUTIVE SUMMARY

Low Carbon Development Initiative

Having achieved notable economic and social progress throughout the past decade, Indonesia still has to face many structural challenges such as deterioration of natural resources, ecological degradation, and growing income inequalities. To tackle these issues and to attain sustainable development growth, the Government of Indonesia (GoI) has been working progressively on Low Carbon Development Initiative (LCDI) policy ever since it was initiated during the UNFCCC COP 23 in 2017.

LCDI aims to explicitly incorporate the environmental considerations (carbon emissions reduction targets and carrying capacity) into the national development-planning. Under the mandate of the Law 32/2009 on Environmental Protection and Management and its operational guidelines of Government Regulation (PP) 46/2016 on Strategic Environmental Assessment (SEA), the Government of Indonesia through BAPPENAS, has conducted the SEA by assessing policies, plans, and/or programs with respect to the environmental conditions as part of development of the National Medium-Term Development Plan (RPJMN) 2020-2024. The process was carried out by applying system dynamics modelling, a planning tool that allows simultaneous assessment of social, environmental and economic impacts in various development scenarios into its strategic planning.

During LCDI Phase 1, the system dynamics modelling exercise produced Low Carbon Development scenarios that will be integrated in the RPJMN 2020-2024, which will guide Indonesia's development to transition towards a low carbon pathway. The policy scenarios developed by the model produced favorable results such as:

- Achievement of Indonesia's NDC targets by yielding emission reduction up to 43 % by 2030 and emission intensity reduction up to 51% by 2045.
- Facilitation of 6% of GDP growth per year between 2019-2045.
- Increased employment by provision of 15,3 million additional jobs by 2045.
- Promotion of renewable energy by targeting a 30 % share of biofuels in the transportation sector to substitute fossil fuel demand. This in turn will provide fiscal savings up to nearly 120 billion US$ (0.54 % of GDP) by 2045 from the reduced oil subsidies.
- Transition towards renewable energy by scaling up its contribution up to 30% by 2045 and decrease of energy intensity up to 4,5% by 2045.
- Full enforcement of forest, palm oil, mining, and peat land moratorium to preserve 41.1 million ha of primary forest, which includes 15 million ha of peat land; while also abiding to committed water, fisheries, and biodiversity targets.

The above policy scenarios indicate how implementation of LCDI could deliver immediate gains for the economy, for people and for the local and global environment. However, several challenges exist that might hinder a fast and effective implementation of LCDI within the national and sub-national level. Notable challenges include the absence of an appropriate coordinating mechanism for regulatory and operational procedures; the need of high engagement and communication with stakeholders from public and non-public sectors; the sectoral and silo-based institutional setting doubled with sectoral regulation which may hinder the mobilization, coordination, monitoring, and evaluation efforts during the implementation phase; the absence of a reliable and integrated database system; lack of personnel competencies, especially those related to the system dynamic modelling; and the finance and investment gap which requires the formulation of resource mobilization mechanisms and strategies to mobilize financial resources from the state budget, private sector, as well as international funds.

With the aforementioned condition, the LCDI Phase 2 will be focused on translating the LCDI policy into programmatic activities with twofold objectives; the first is to address challenges in LCDI Phase 1 in order to support LCDI model development for next RPJMN, and second is to support the implementation of LCDI development scenarios by involving multi-stakeholders, improving the integrated Monitoring, Evaluation and Reporting system, strengthening communication and replicating the LCD model at the sub-national level. Moreover, in the implementation process, since LCDI model serves as an overarching framework, it requires active participation and engagement of state actors within national and sub-national level, as well as non-state actors including the private sector and development partners.

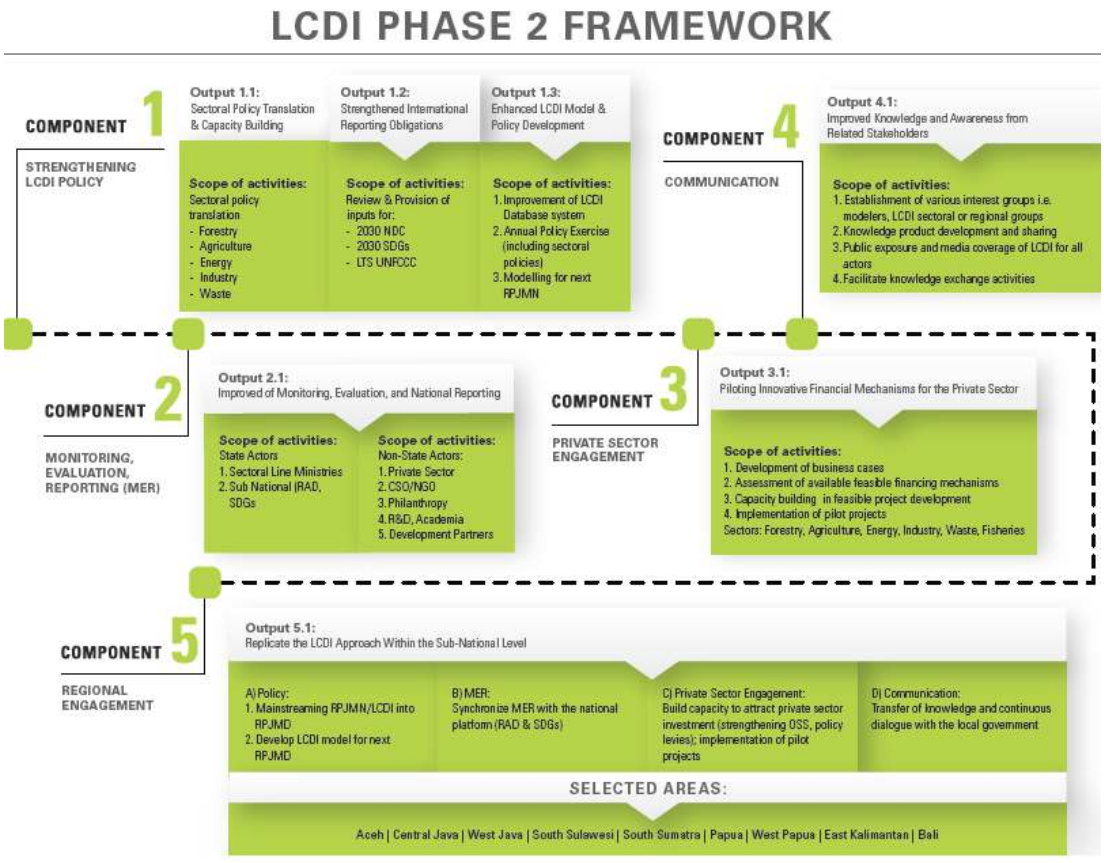

Figure 1. LCDI Phase 2 Framework

the Government of Indonesia (GoI)'s priority sectors for the LCDI Phase 2 are energy, industry, agriculture, forestry & peat (land-use), blue carbon (mangrove, seagrass), and waste.

Based on the assessment with respect to the economic, social, and environmental profiles of Indonesia; as well as the mapping of currently enacted policies and governance structure; to achieve its objective, it is considered best to align the PAGE Indonesia workplan with implementation of the LCDI Phase 2 framework. The framework provides avenue in bringing out collaborative effort to promote and support inclusive green economy interventions and program within National and Sub-National level as illustrated in Figure 1. In addition, the framework is in accordance with the GoI development policy agenda and commitment as it is also interlinked with the RPJMN.

This Stocktaking study has identified several areas of support to be provided by PAGE Indonesia for implementation of LCDI policy scenarios in the energy, industry, waste, agriculture, forestry & peat, and blue carbon sectors. These interventions may comprise of 1) Support at the national level to translate LCDI targets into specific sectoral policies; 2) Enhance the LCDI model and improve the database system development required for LCDI modelling in the next National Mid-Term Development Plan (RPJMN 2025-2029); 3) Support local governments to mainstream the national LCDI model within their Regional Medium-Term Development Plans (RPJMD) and build capacity for its utilization for the next term planning process; 4) developing a private sector engagement platform and incentives for the private sector to support implementation of the LCDI; and 5) improve knowledge and awareness of LCDI amongst stakeholders.

TABLE OF CONTENT

ACKNOWLEDGEMENT **2**
EXECUTIVE SUMMARY **4**
TABLE OF CONTENT **7**
LIST OF TABLES **8**
LIST OF BOXES **8**
LIST OF FIGURES **9**
LIST OF ABBREVIATIONS **9**

1 INTRODUCTION AND BACKGROUND **14**
1.1 Indonesia in Transition towards Green Economy 14
1.2 Objectives of the Study 15
1.3 Study Methodology 15
1.4 Outline of the Study 15

2 COUNTRY PROFILE **18**
2.1 Economic Profile 18
2.2 Environmental Profile 24
2.3 Social Profile 34

3 RELEVANT POLICIES AND INITIATIVES **38**
3.1 Low Carbon Development Initiative (LCDI) 38
3.1.1 System Dynamics Modelling as LCD Planning Tool 40
3.2 Other Policies and Regulations Relevant to LCDI 44
3.2.1 Energy Policies 44
3.2.2 Forestry, Peatland and Reforestation Policies 45
3.2.3 Waste and Industrial Management Policies 47
3.2.4 Agriculture Policies 49
3.2.5 Institutional and Governance Policies 50
3.3 Green Growth Policy Review of OECD 53
3.3.1 Energy – policy gaps and recommendations 54
3.3.2 Land use – policy gaps and recommendations 55
3.3.3 Waste and industrial management - policy gaps and recommendations 56
3.3.4 Institutions and Governance – policy gaps and recommendations 57

4 KEY INSTITUTIONS AND ORGANIZATIONS 62
4.1 Government 62
4.2 Private Sector 62
4.3 Educational, Research and Training Institutions 63
4.4 Other Development Partners 63

5 PRIORITIES AND POSSIBLE ACTIONS FOR IMPLEMENTING LCDI 66
5.1Challenges and Opportunities towards LCDI implementation 66
5.2 UN PAGE Initiative for LCDI Phase 2 71

6 REFERENCES 76

Annex 1. Suggested PAGE Interventions 80
Annex 2. Partners With Direct Interventions Towards LCDI 89
Annex 3. Interlinkage Between PAGE Indonesia And LCDI Phase 2 93

LIST OF TABLES

Table 1. Total Economic Contribution of Biological Diversity and Ecosystem 29
Table 2. Extent of land cover types in forest area and non-forest area in Indonesia (2017) 31
Table 3. Interlinkage of LCDI's Parameters and SDGs 41
Table 4. LCDI Development Scenarios 43
Table 5. Energy Policies and Regulations Relevant to LCDI 44
Table 6. Forestry, Peatland and Reforestation Policies and Regulations Relevant to LCDI 45
Table 7. Waste and Industrial Management Policies and Regulations Relevant to LCDI 47
Table 8. Agriculture Policies and Regulations Relevant to LCDI 49
Table 9. Institutional and Governance Policies and Regulations Relevant to LCDI 50

LIST OF BOXES

Box 1. Policy Recommendations for the Energy Sector 55
Box 2. Policy Recommendations for the Land Use Sector 56
Box 3. Policy Recommendations for the Waste Sector 57
Box 4. Policy Recommendations for Environmental Governance, Management and Green Growth 58

LIST OF FIGURES

Figure 1. LCDI Phase 2 Framework 5
Figure 2. Source of Economic Growth in Indonesia in 2016-2018 18
Figure 3. Industry Sectors' Contributions to Economic Growth 19
Figure 4. Indonesia's GDP for the Year of 2014-2018 in Trillion Rupiah 20
Figure 5. Indonesia's GDP for the Year of 2014-2018 in Trillion Rupiah 20
Figure 6. Indonesia's Industry Sectors' Contributions to GDP in 2018 in IDR Trillion 21
Figure 7. Indonesia's Export, Import and Trade Balance for the Year of 2014-2018 (Million USD) 22
Figure 8. Trend Condition of Indonesian Economic Growth 22
Figure 9. Indonesia's External Debt in 2014-2018 in USD Million 23
Figure 10. Indonesia's Government Revenues in 2014-2018 in IDR Billion 23
Figure 11. GHG Emissions Reduction by Type of Mitigations Sector in 2015 and 2016 Compared to GHG Emissions 25
Figure 12. The Trend of Fuel Mix for Power Generation 26
Figure 13. Surface Water Availability in Indonesia 27
Figure 14. Ground Water Availability in Indonesia 28
Figure 15. Percentages of areas allocated to various land uses in the Forest Land and Marine Conservation 30
Figure 16. Methodology & Model Integration Process for KLHS and RPJMN 2020-2024 39
Figure 17. The Indonesian Vision 2045: Baseline Model for LCDI 39
Figure 18. LCDI Phase 2 Framework 68
Figure 19. Problem Tree - Situational Analysis 71
Figure 20. Results Map 73

LIST OF ABBREVIATIONS

AFOLU	:	Agricultural, Forest and Other Land Use
APBN	:	State Budget ("Anggaran Pendapatan dan Belanja Negara")
APINDO		Indonesian Entrepreneur Association ("Asosiasi Pengusaha Indonesia")
BAPPENAS	:	National Planning Agency ("Badan Perencanaan Nasional")
BKF	:	Fiscal Policy Body ("Badan Kebijakan Fiskal")
BKPM	:	Investment Coordinating Board ("Badan Koordinasi Penanaman Modal")
BLU	:	Public service agency ("Badan Layanan Umum")
BMU	:	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMZ	:	The German Federal Ministry for Economic Cooperation and Development
BOE	:	Barrels Oil Equivalent
BPS	:	National Statistics Body ("Badan Pusat Statistik")
BUR	:	Biennial Updated Report
CO2	:	Carbon dioxide
CO2e	:	Carbon dioxide equivalent
COP	:	Conference of the Parties
CPI	:	Climate Policy Initiative
CSO	:	Civil Society Organization
FMU	:	Forest Management Unit
FOLU	:	Forest and Other Land Use
FOLU	:	Food and Land Use Coalition
GAPKI	:	Indonesian Palm Oil Association ("Gabungan Pengusaha Kelapa Sawit Indonesia")
GDP	:	Gross Domestic Product

Gg	:	Giga gram
GGGI	:	Global Green Growth Institute
GHG	:	Green House Gases
GIZ	:	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoI	:	Government of Indonesia
HK	:	Conservation Forest ("Hutan Konservasi")
HL	:	Protection Forest ("Hutan Lindung")
HP	:	Production Forest ("Hutan Produksi")
HPT	:	Limited Production Forest
IBCSD	:	Indonesia Business Council for Sustainable Development
ICRAF	:	World Agroforestry Centre
IDeA	:	Indonesia Institute of Deliverology
IDR	:	Indonesian Rupiah
IGCN	:	Indonesian Global Compact Network
IGE	:	Inclusive Green Economy
I-GEM	:	Indonesia Green Economy Model
IIASA	:	International Institute for Applied System Analysis
IISD	:	International Institute for Sustainable Development
ILO	:	International Labour Organization
IPPU	:	Industrial Processes and Production Use
IV2045	:	Indonesia Vision 2045
KADIN	:	Indonesia Chamber of Commerce ("Kamar Dagang dan Industri Indonesia")
KLHS	:	Strategic Environmental Assessment – SEA ("Kajian Lingkungan Hidup Strategis")
kWh	:	Kilowatt hour
LCD	:	Low Carbon Development
LCDI	:	Low Carbon Development Initiative
LECB	:	Low Emission Capacity Building Programme
LFA	:	Logical Framework Analysis
MEMR	:	Ministry of Energy and Mineral Resources
MER	:	Monitoring, Evaluation, and Reporting
METI	:	Indonesia Renewable Energy Society ("Masyarakat Energi Terbarukan Indonesia")
Mha	:	Million hectares
MoA	:	Ministry of Agriculture
MoE	:	State Ministry of Environment (before 2014)
MoEF	:	Ministry of Environment and Forestry
MoF	:	Ministry of Finance
MOHA	:	Ministry of Home Affairs
MoI	:	Ministry of Industry
MRV	:	Measurable, Reportable, and Verifiable
NCE	:	New Climate Economy
NDC	:	Nationally Determined Contribution
NGO	:	Non-Government Organization
NICFI	:	Norway's international climate and forest initiative
O2	:	Oxygen
ODI	:	Overseas Development Institute
OECD	:	Organisation for Economic Co-operation and Development
OJK	:	Financial Services Authority ("Otoritas Jasa Keuangan")
PAGE	:	Partnership for Actions on Green Economy
PaSTI	:	Partnership to Strengthen Transparency for co-Innovation

PK-APBN		Policy Center of APBN
PPPs	:	Purchasing Power Parity
PROPER	:	Company Performance Assessment Program in Environmental Management ("Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan Hidup")
PT SMI	:	PT Sarana Multi Infrastruktur
PwC	:	PricewaterhouseCoopers
RAD-GRK	:	Regional Action Plan for Greenhouse Gas Emission Reduction ("Rencana Aksi Daerah – Gas Rumah Kaca")
RAN-GRK	:	National Action Plan for Greenhouse Gas Emission Reduction ("Rencana Aksi Nasional – Gas Rumah Kaca")
RE	:	Renewable Energy
RPJMD	:	Regional Mid-Term Development Plan ("Rencana Jangka Menengah Daerah")
RPJMN	:	National Mid-Term Development Plan ("Rencana Jangka Menengah Nasional")
RUEN	:	National General Energy Plan ("Rencana Umum Energi Nasional")
SBN	:	Indonesia State Securities ("Surat Berharga Negara")
SCP	:	Sustainable Consumption & Production
SDGs	:	Sustainable Development Goals
SEA	:	Strategic Environmental Assessment
SIINAS	:	National Industrial Information System ("Sistem Informasi Industri Nasional")
SISNERLING	:	Environmental Balance System ("Sistem Neraca Lingkungan")
SNA	:	System of National Accounts
SSC/TrC	:	South-South and Triangular Cooperation
TNC	:	The Nature Conservancy (TNC)
UKCCU	:	United Kingdom Climate Change Unit
UKP4	:	President's Delivery Unit for Development and Oversight ("Unit Kerja Presiden Bidang Pengawasan dan Pengendalian Pembangunan")
UN	:	United Nations
UNDP	:	United Nations Development Programme
UNEP	:	United Nations Environment Programme
UNFCCC	:	United Nations Framework Convention on Climate Change
UNIDO	:	United Nations Industrial Development Organization
UNITAR	:	United Nations Institute for Training and Research
WRI	:	World Resources Institute
y.o.y	:	year on year

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1

INTRODUCTION AND BACKGROUND

1 INTRODUCTION AND BACKGROUND

1.1 Indonesia in Transition towards Green Economy

Over the last decade, Indonesia has achieved important economic and social progress amidst the challenging global economy. The country's GDP per capita steadily rose from $857 in 2000 to $3,847 in 2017.[1] In 2018, Indonesia is the world's 10th largest economy in terms of purchasing power parity and a member of the G-20. [2] Nevertheless, several structural challenges that can hinder Indonesia's goals still remain, among them are the deterioration of natural resources, ecological degradation, and growing income inequalities.

As the Ministry of Development Planning/National Development Planning Agency of the Republic of Indonesia, or BAPPENAS, is concerned, recognizing climate change impact on economic trajectory can contribute to potential loss of GDP up to 20 %.[3] That will lead to further growth of imbalances and social problems. A sustainable development approach balancing the economic, social, and environmental aspects, i.e. the inclusive green economy framework, is needed and expected to address the issues.

The United Nations Environment Programme has defined green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities".[4] In other words, it emphasizes on a low-carbon, efficient, and clean production, and also an inclusive consumption and outcome based on sharing, circularity, collaboration, solidarity, resilience, opportunity, and interdependence. In the context of sustainable development and poverty eradication, green economy approach is believed to be one of the important tools available for achieving sustainability and supporting delivery of the Sustainable Development Goals (SDGs). It can provide options for policymaking without necessarily being a rigid set of rules to realize poverty eradication, economic growth, and social inclusion, as well as to improve human welfare and decent work for all, while maintaining the healthy functioning of the earth's ecosystems.[5]

As the Government of the Republic of Indonesia first declared its commitment in mainstreaming low carbon and green economy during the COP 23 UNFCCC in Bonn[6]; it was reaffirmed again in the Low Carbon Development (LCD) and Green Economy Conference in Bali, in October 2018. The Government believes that low carbon development and green economy are the keys to further boosting economic growth without sacrificing environmental sustainability and social inclusivity. Translating that commitment, the Government has initiated the Low Carbon Development Initiative (LCDI) framework as part of its strategic planning and policy since 2018.

1 World Bank: *https://data.worldbank.org/indicator/ny.gdp.pcap.cd*
2 World Bank: *https://www.worldbank.org/en/country/indonesia*
3 BAPPENAS, 2018: *Press Release*
4 UNEP, 2012: *https://wedocs.unep.org/bitstream/handle/20.500.11822/8659/-%20Green%20economy_%20what%20do%20we%20mean%20by%20green%20economy_%20-2012Main%20briefing%202012--Final.pdf?sequence=2&isAllowed=y*
5 UN Rio 20+, 2012: *The Future We Want*
6 BAPPENAS, 2018: *https://www.bappenas.go.id/files/9715/4141/6359/Siaran_Pers_-_Pemerintah_Indonesia_Berkomitmen_Mengarusutamakan_Pembangunan_Rendah_Karbon_dan_Ekonomi_Hijau.pdf*

The Government's commitment to implement LCD is formalized by BAPPENAS mainstreaming LCDI policy scenarios into Indonesia's National Mid-Term Development Plan (RPJMN) 2020-2024. The work is mandated by the Government Regulation (PP) 46/2016 on Strategic Environmental Assessment (SEA), in this case the assessment of policies, plan and programs with respect to environmental conditions will be integrated into the RPJMN 2020-2024.

To strengthen its transition towards Green Economy, the Government of Indonesia has entered into the Partnership for Action on Green Economy. Five UN Agencies – UNEP, UNDP, UNIDO, ILO and UNITAR have initiated collaboration with the Government of Indonesia to support the government transitioning green economy principles into the national planning. The five UN agencies aim to mobilize social awareness and provide specialized training aimed at identifying critical bottlenecks, formulating and assessing policy options, and enabling policy implementation for greening the economy in Indonesia.

1.2 Objectives of the Study

The main objectives of the Stocktaking study are:
- To summarize relevant economic, social and environment policies in Indonesia.
- To review ongoing and planned initiatives and projects.
- To summarize economic and other relevant studies and assessments.
- To identify key national and international institutions and actors relevant for achieving PAGE objectives.
- To identify priority work streams and action under the national PAGE partnership.

1.3 Study Methodology

The two main methodologies used for this study were desk review as well as interviews and consultations with relevant national stakeholders. Firstly, information for the stocktaking was collected through a review of national green economy related strategies, action plans, policies, policy assessments, tools to promote green economy, capacity needs assessments, and practical experiences relevant for understanding the green economy development in Indonesia. Secondly, through a consultative process, contextual information was obtained from a number of stakeholders in government organizations, particularly key Directorates of the Ministry of National Development Planning (BAPPENAS). Other important stakeholders that were consulted were donor organizations and development partners who are supporting the Government of Indonesia in the green economy development.

1.4 Outline of the Study

This report consists of five chapters. The introduction and background to Indonesia's commitment to green economy transition are presented in Chapter 1. An overview of Indonesia's economic, social and environmental conditions for a green economy transition is provided in Chapter 2. Chapter 3 provides an overview of policies and initiatives in Indonesia that are relevant to green economy transition, with a focus on LCDI (Low Carbon Development Initiative). Green economy policy gaps and recommendations based on OECD's Green Growth Policy review are also summarized in this chapter. Chapter 4 identifies key organizations and institutions that contribute to LCDI and green economy in Indonesia. Various challenges and opportunities to implement the LCDI and recommendations on potential PAGE interventions are discussed in Chapter 5.

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2

COUNTRY PROFILE

2 COUNTRY PROFILE

This section provides and overview of Indonesia's economic, social and environmental profile with regards to green economy transition.

2.1 Economic Profile

In 2018, the National Statistics Agency[7] indicated that the Indonesian national economy grew at 5.17%, slightly higher than 5.07% increase in 2017. In terms of inflation, Indonesia experienced an inflation rate at 3.13%[8] in 2018, slightly lower than 3.61% inflation rate in 2017. Composition of the source of economic growth has not been changed compared to those of previous years. Household consumption was still the main engine of economy in the country, increasing the national economy at 2.74% or contributing more than 50% to the GDP growth in 2018. Gross fixed capital formation that indicated the new value-added in the economy increased the country's GDP growth at 2.17% in that year.

5.03% 5.07% 5.17%

Description (in %)	2016	2017	2018
Household Consumption	2.72	2.69	2.74
Gross Fixed Capital Formation	1.45	1.98	2.17
Others	0.86	0.40	0.26
GDP Growth	5.03	5.07	5.17

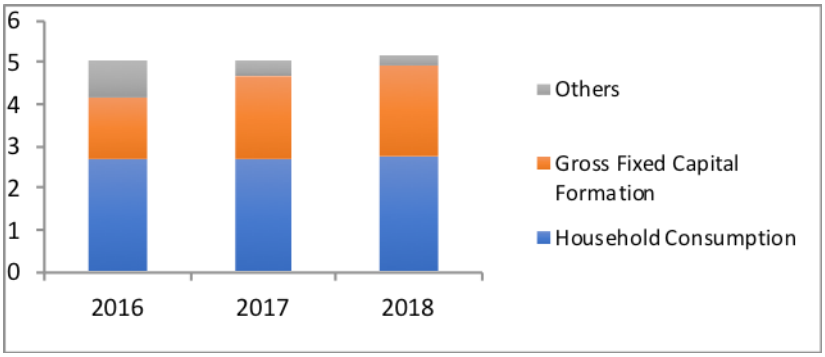


Figure 2. Source of Economic Growth in Indonesia in 2016-2018
Source[9]: Team Analysis, 2019

7 Badan Pusat Statistik, 2019: *Pertumbuhan Ekonomi Indonesia Triwulan IV-2018 No.15/02/Th.XXII, 6 Februari 2019, Badan Pusat Statistik, 2019*
8 Bank Indonesia: *https://www.bi.go.id/id/moneter/inflasi/data/Default.aspx*
9 Source same as indicated of footnote #14

In terms of industry sectors' contribution to the economic growth, the Indonesian processing industry sector including manufacturing increased the national economy at 0.91%, while trading, construction, and agriculture industry sectors were at 0.66%, 0.61%, and 0.49%, respectively. Other industry sectors in aggregate contributed the biggest portion, increasing the national economy at 2.5%. The portion of 5,17% economic growth is illustrated in the pie chart below.

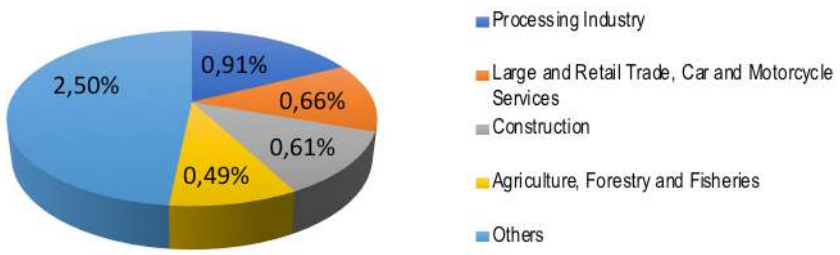


Figure 3. Industry Sectors' Contributions to Economic Growth
Source: Team Analysis, 2019

In terms of agriculture, the 2015-2019 Strategic Plan of the Ministry of Agriculture10 indicates agroindustry development focusing on palm oil, rubber, cacao, tea, coffee, coconut, mango, pineapple, mangos teen, bark, and potatoes. The Ministry of Agriculture also aims to establish national self-sufficiency in rice, corn and soybeans, and increased meat and sugar production. Those five commodities for national self-sufficiency objectives are the main focus of the Ministry of Agriculture up to 2019, with strategic implementation aims to increase productivity from the upstream to the downstream of the industry sector. That includes infrastructure development, i.e. irrigation, as well as production, logistics, marketing, and distribution to consumers. In general, Indonesian strategic plan on agriculture includes the following:

a. achievement of self-sufficiency rice, corn and soybeans and increased meat production and sugar,
b. increasing food diversification,
c. increasing value-added commodities, competitiveness in fulfilling export market and import substitution,
d. provision of raw materials bioindustry and bioenergy
e. increased family income farmers, and
f. accountability for the performance of government officials well.

The strategic plan above was translated into more detail strategy at provincial and sub-sector level.

Moreover, as a country with the largest populaxstion in South East Asia, Indonesia recorded a total GDP of IDR14,837 trillion on the basis of current prices in 2018. That is equal to USD1,054.3 billion at the exchange rate of IDR14,000 per USD. The 2018 GDP is higher than that of 2017 at IDR13,587 trillion. The 2018 growth keeps the country's record for continuous GDP growth at least within the last five years.

10 The Ministry of Agriculture of the Republic of Indonesia, 2014. *Rencana Strategis Kementerian Pertanian Tahun 2015-2019* [Strategic Plan of the Ministry of Agriculture Year 2015-2019], the Ministry of Agriculture, 2014

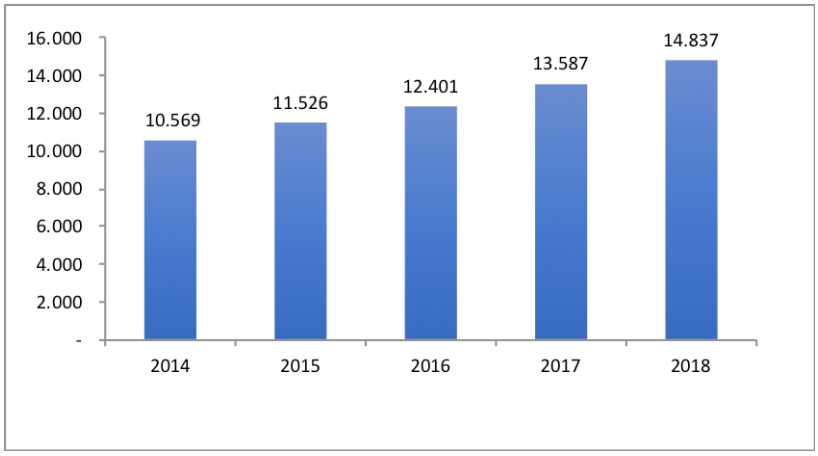


Figure 4. Indonesia's GDP for the Year of 2014-2018 in Trillion Rupiah
Source[11]: Team Analysis, 2019.

A study by PricewaterhouseCoopers in 2018 revealed that the Indonesian economy would be one of the major risers in South East Asia Region together with those of Vietnam and Philippines in terms of GDP at Purchasing Power Parity (PPPs). As the Indonesian GDP keeps increasing for years, the Indonesian economy is projected to climb up from the 8th rank in 2016 to the 4th in 2050 world economy. The projection was made in accordance with a GDP model accommodating four main supply-side factors: working-age population growth, investment in physical capital, investment in human capital, and total factor productivity levels.

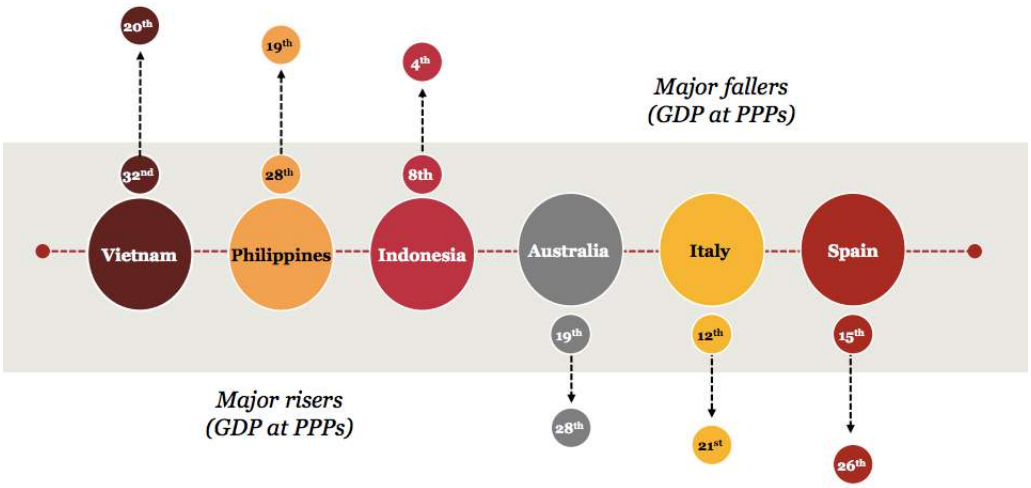
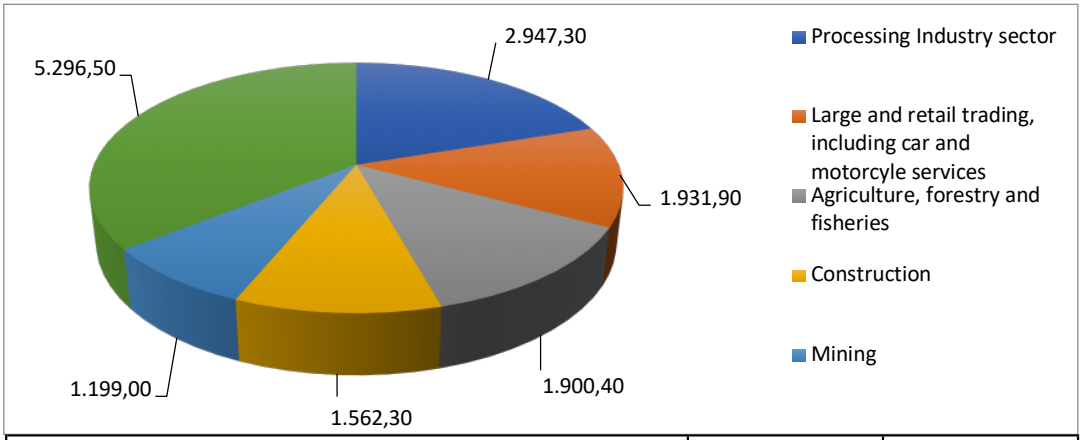


Figure 5. Indonesia's GDP for the Year of 2014-2018 in Trillion Rupiah
Source[12]: PricewaterhouseCoopers, 2018

Furthermore, Indonesian GDP structure is comprised of different industry sectors' productions. In 2018, processing industry sector was the largest proportion of the Indonesian economy, contributing IDR2,947.20 trillion or 19.86% to the country's GDP. The second was trading industry sector with IDR1,931.90 trillion, followed by the agriculture, forestry and fisheries with IDR1,900.40 trillion as the third contributors to the national economy. Construction industry sector contributed IDR1,562.30 trillion to the 2018 GDP, while mining was at IDR1,199.00 trillion. Other industry sectors

11 https://www.bps.go.id/dynamictable/2015/05/06/826/-seri-2010-pdb-triwulanan-atas-dasar-harga-berlaku-menurut-lapangan-usaha-miliar-rupiah-2014-2018.html
12 John Hawksworth: The World in 2050: the Shift of Global Economic Power and the Challenge of Automation,

contributed 38.70% to the national economy with each sector had less than IDR1,000 trillion contribution to the GDP. In terms of production areas, Indonesian GDP in 2018 was still dominated by production activities in Java (58.48%) and Sumatra (21.58%). The smallest contribution came from Maluku and Papua at 2.47% of the GDP.



Industry Sector	GDP in Trillion Rupiah	Percentage
Processing Industry sector	2,947.30	19.86%
Large and retail trading, including car and motorcyle services	1,931.90	13.02%
Agriculture, forestry and fisheries	1,900.40	12.81%
Construction	1,562.30	10.53%
Mining	1,199.00	8.08%
Others	5,296.50	35.70%
Total 2018 GDP	**14,837.40**	**100.00%**

Figure 6. Indonesia's Industry Sectors' Contributions to GDP in 2018 in IDR Trillion
Source: [13]Team Analysis, 2019

As of August 2018, Indonesian workforce was 124 million people contributing to the national economy, where 49.2 million of them working as employees. Only 5.2 million people worked in agriculture sector. There are no official data about the green jobs in Indonesia. A study by ILO in 2013 specified 3,985,866 green jobs out of 8,811,012 jobs closely related to the environmental issues. Those come from agriculture, forestry, fisheries, mining and energy, manufacturing, construction, transportation, tourism, and waste.

Whereas its GDPs have increased over the years, negative trade balance is still one of critical issues of the Indonesian economy. In 2018, the government data has indicated that Indonesia's import value was USD188,711 million in 2018, which was much higher than the export value at USD180,215 million in that year. That has resulted a national deficit as much as USD8,496 million in 2018, affecting the depreciation of Rupiah above the level of IDR14,000 per USD in the fourth quarter of the year. The 2018 deficit was also the worst in the last five years resulting a big concern of the government when starting the fiscal year of 2019.

13 Badan Pusat Statistik, 2019: Pertumbuhan Ekonomi Indonesia Triwulan IV-2018 No.15/02/Th.XXII, 6 Februari 2019, Badan Pusat Statistik, 2019

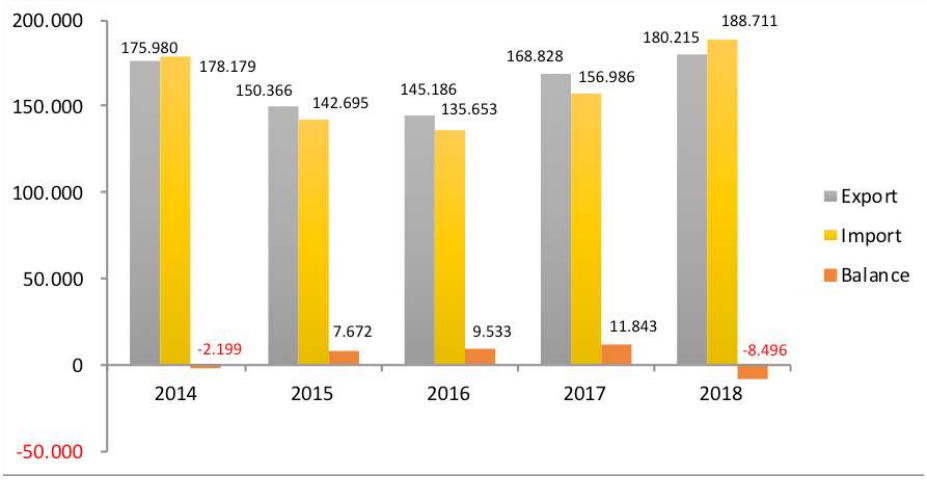


Figure 7. Indonesia's Export, Import and Trade Balance for the Year of 2014-2018 (Million USD)
Source[14]: Team Analysis, 2019.

The graph below [15]indicated that Indonesia's economy is growing at a healthy pace. Exports have grown faster than export markets. Increased imports of capital goods and higher oil prices pushed the trade balance into deficit during 2018. Consequently, the current account deficit has widened but it remains moderate, at 2.9% of GDP in the first three quarters of 2018.

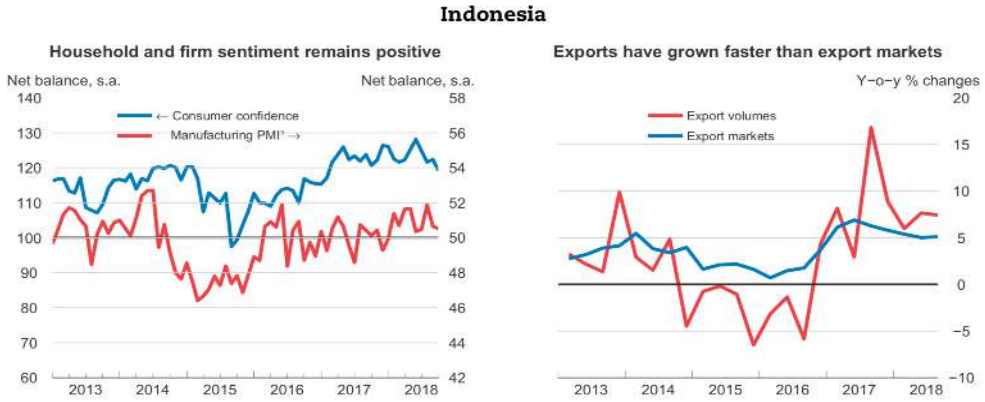


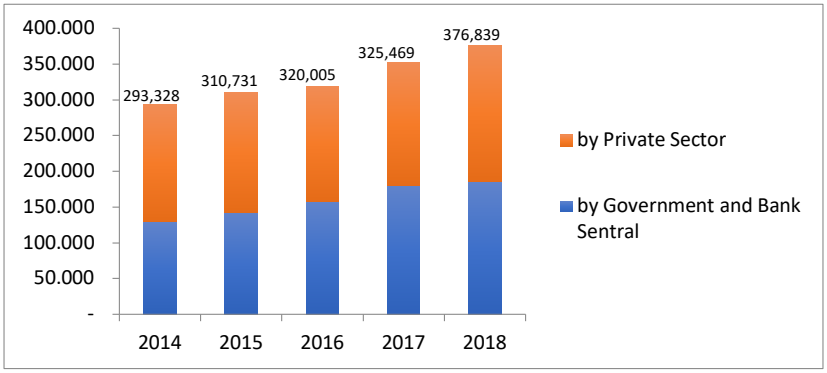
Figure 8. Trend Condition of Indonesian Economic Growth
Source: OECD Economic Outlook, Volume 2018 Issue 2- Preliminary Version 2018

Another issue of the Indonesian economy is the increasing external debt, at least for the last five fiscal years. At the end of 2018, Indonesia's external debt was recorded at USD 376,839 million. It grew 6.9% (year on year) and the growth was higher compared to that of previous year at 4.2% (y.o.y) increase. One of significant factors influencing the rise of debt in 2018 was the pre-funding activities for 2019 fiscal year by the government through the issuance of Indonesia state securities or *surat berharga negara* (SBN).

Indonesian external debt is comprised of the external debt of the government and the central bank and the external debt of the private sector. By end of 2018, the external debt of government and central bank increased 3.3% (y.o.y), while private sector recorded an increase of external debt at 10.9% (y.o.y). Despite the concern on the increase of Indonesian external debt, its percentage against the GDP was still at 36% by end of 2018. In addition, 86.3% Indonesian external debt was

14 http://www.kemendag.go.id/id/economic-profile/indonesia-export-import/indonesia-trade-balance
15 http://www.oecd.org/eco/outlook/economic-forecast-summary-indonesia-oecd-economic-outlook.pdf

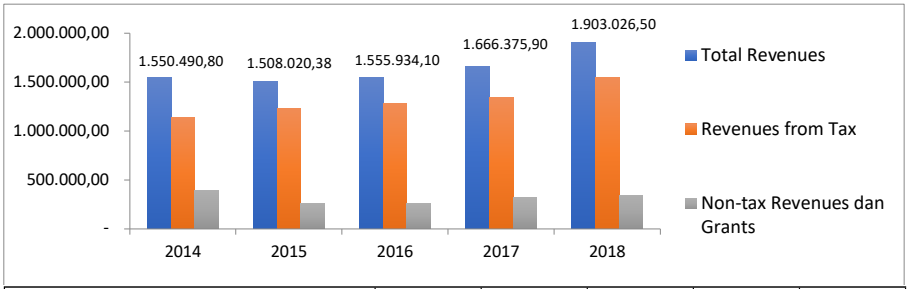
dominated by long-term debt, in which it allowed the government to manage economic growth to compensate debt repayments in the long run.



External Debt of Indonesia (in million USD)	2014	2015	2016	2017	2018
by Government and Bank Sentral	129,736	142,608	158,283	180,622	186,220
by Private Sector	163,592	168,123	161,722	171,847	190,619
Total External Debt	**293,328**	**310,731**	**320,005**	**352,469**	**376,839**

Figure 9. Indonesia's External Debt in 2014-2018 in USD Million
Source: [16] Team Analysis, 2019

In terms of government revenues, in 2018, about 99% of the government revenues came from domestic sources comprising of revenues from tax and non-tax revenues. Government revenues was recorded at IDR1,903,026.50 billion. Revenues from tax was IDR1,548,485.00 including revenues from income tax, value added tax, property tax, international-trade tax, excise, and other taxes. Non-tax revenues came from dividends from the state-owned enterprises, royalties from the natural-resources extraction activities, service charges generated by the public service agencies (BLUs), and other non-tax government revenues with a total of IDR349,158.30 billion. Grants contributed to the small portion of government revenues amounted to IDR5,383.20 billion.



Revenues of the Government	2014	2015	2016	2017	2018
Revenues from Domestic	1,545,456.30	1,496,047.34	1,546,946.40	1,654,746.10	1,897,643.30
- Revenues from Tax	1,146,865.80	1,240,418.86	1,284,970.10	1,343,529.80	1,548,485.00
- Non-tax Revenues	398,590.50	255,628.48	261,976.30	311,216.30	349,158.30
Grants	5,034.50	11,973.04	8,987.70	11,629.80	5,383.20
Total Revenues	**1,550,490.80**	**1,508,020.38**	**1,555,934.10**	**1,666,375.90**	**1,903,026.50**

Figure 10. Indonesia's Government Revenues in 2014-2018 in IDR Billion
Source[17]: Team Analysis, 2019

Overall, Indonesia's national economy is dominated by both energy and labour-intensive industry

16 Kementerian Keuangan Republik Indonesia dan Bank Indonesia, 2019: Statistik Utang Luar Negeri Indonesia (External Debt Statistics of Indonesia), Vol.X, Februari 2019, Kementerian Keuangan Republik Indonesia dan Bank Indonesia
17 https://www.bps.go.id/statictable/2009/02/24/1286/realisasi-penerimaan-negara-milyar-rupiah-2007-2018.html

sectors, e.g. manufacturing, agriculture, forestry, fisheries, and construction. Its GDP structure indicates that agriculture does not dominate the country's national economy. However, food resiliency issues have been becoming the Indonesian government's concern. For that, Indonesia has the Food Security Agency under the Ministry of the Agriculture. The main duties of the agency are to guard food distribution and price stability and affordability, to ensure food availability at national and sub-national level, and to develop and maintain food diversity and quality. There are at least seven strategic food commodities managed by the Indonesian Food Security Agency: rice, corn, soybean, red chili, red onion, white sugar, and meat.

At the end, it can be concluded that the macroeconomic figures and growth indicated the Indonesia's economic resilience despite the global economic turmoil due to global events, such as the 2016 Brexit, US-China Trade War, and the slowing down of China's economic growth. In connection with low carbon development, as previously mentioned and as BAPPENAS is concerned, LCDI implementation potentially results an increase in GDP up to 23% by 2045. Under Indonesian 2018 economic setting, that indicates an additional prospective GDP as much as IDR2,967 trillion, resulting potentially higher GDP in 2018 from IDR14,837 trillion to IDR18,250 trillion. That would be one of significant background in which, in terms of national development, it must be well managed under inclusive green economy approach.

2.2 Environmental Profile

Whilst the Indonesian national economy is increasing, it affects the GHG emissions level as well, especially from forest and other land use (FOLU) and energy sectors. As indicated by the Indonesia Second Biennial Updated Report (BUR), 2018[18], its national GHG emissions in 2016 reached 1,461,367 Gg CO2e for 5 gases (CO2, CH4, N2O, CF4 and C2F6) or 1,457,774 Gg CO2e for 3 gases (CO2, CH4, N2O). In terms forest area, Indonesia has a total of 95,272 thousand hectares, of which 17,425 thousand hectares were classified as Conservation Forest (HK), 24,094 thousand hectares as Protection Forest (HL), 18,217 thousand hectares as Production Forest (HP), 21,537 hectares as Limited Production Forest (HPT), and 6,455 thousand hectares as Convertible Production Forest.

Furthermore, Indonesian GHG emissions were contributed mainly from peat fires (51.59%) followed by energy (36.91%) given heavy reliance on coal – see Figure 11, waste (7.71%), and Industrial Processes and Product Use (IPPU) (3.79%). The figures in 2016 were higher than year 2000's emissions and significantly lower than those of 2015. As El Nino occurred in 2015, Indonesia had higher emissions compared to previous years due to the high emissions from peat fires. It recorded an increase of 76% compared to the 2013's emission level at 1,349,801 Gg CO2e.

In Figure 11 below, estimated emission increased about 669,000 Gg CO2e in 2015, much higher from the 29% reduction or 834,000 Gg CO2e of year 2030 baseline. The increase was mainly due to significant increase in emission from forest and FOLU sectors. One year after, in 2016, the emission reduction was about 311,000 Gg CO2e, which was about 78% of 399,000 Gg CO2e reduction target by 2020. However, most of the reported emissions reduction achievements have not been verified yet.

18 Indonesia Second Biennial Report under the United Nations Framework Convention on CLimate Change, 2018: *https://unfccc.int/documents/192165*

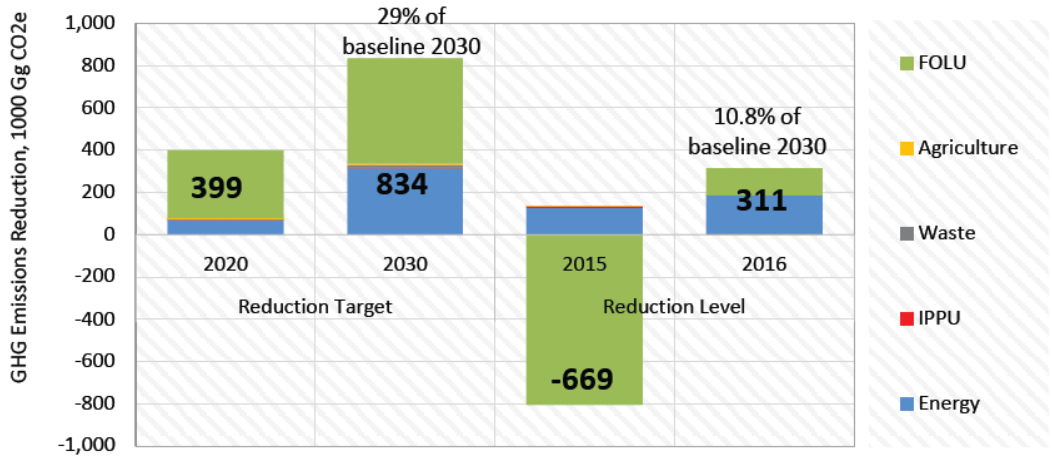


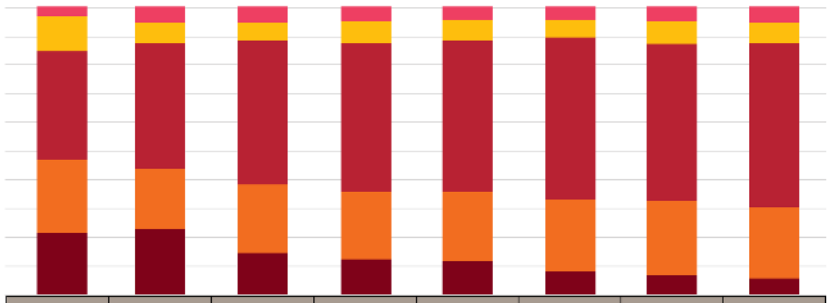
Figure 11. GHG Emissions Reduction by Type of Mitigations Sector in 2015 and 2016 Compared to GHG Emissions
Source: Indonesia Second BUR, 2018

An addition to GHG emission increase, a study by the World Bank in 2016[19] revealed that the cost of forest fire and haze in Indonesia in 2015 was significant, estimated at least USD 16.1 billion (IDR 221 trillion), or equivalent to 1.9% of Indonesia's 2015 GDP. That did not include the negative impact on flora and fauna, which was unidentified. South Sumatra was estimated to have the biggest lost up to USD 3.9 billion (IDR 53.7 trillion). In that year, haze from the fire contributed to the death of 19 people and more than 500,000 cases of acute respiratory infections, with total health damage cost reached USD 151 million. The damage cost due to the school closures in response to the haze was USD 34 million. High levels of haze through most of September and October also resulted in USD 372 million loss in the transportation sector

Moreover, in energy sector, its emissions level is closely related to GDP increase or decrease due to the energy consumption and supply for social economic activities, such as industrial operations, household consumption, transportation sector, as well as the types of energy use (e.g. coal and natural gas). In 2016, the total energy consumption was 1,122 million BOE dominated by residential, industrial, and transportation sectors[20]. The highest growth of the energy consumption in that year was transportation sector by 6.7%, followed by commercial sector by 4.7%, residential sector by 1.9%, and industrial sector by 0.54%. In terms of energy types, the total energy consumption in 2016 was comprised of 63.5 million BOE coal, 407.85 million BOE oil fuels, 101.35 million BOE natural gas I-4, 56.63 million BOE LPG, and 132.41 million BOE electricity. The electricity consumption was supplied by a total of 59 GW power plants in 2016, mainly supplied by coal at 54.7% of the power generation mix.

In 2017, Indonesia had approximately 60.7 GW of installed power plant capacity including PLN/IPP power plants, Private Power Utilities ("PPU") and those operating under non-fossil fuel operating licenses ("IO Non-BBM"). These power plants generated 254.5 TWh of electricity in 2017. The current power generation fuel mix includes coal (57.22%), gas (24.82%), oil (5.81%) and renewables (12.15 %). Development of fuel mix for power generation is illustrated in the bar chart below.[21]

19 World Bank, 2016. The Cost of Fire: An Economic Analysis of Indonesia's 2015 Fire Crisis.
20 MEMR, 2018
21 PWC, 2018. Power In Indonesia Investment and Taxation Guide November 2018, 6th Edition



	2010	2011	2012	2013	2014	2015	2016	2017
Oil	22.00%	22.95%	14.97%	12.54%	11.81%	8.58%	6.96%	5.81%
Gas	25.00%	21.00%	23.41%	23.56%	24.07%	24.89%	25.88%	24.82%
Coal	38.00%	44.06%	50.27%	51.58%	52.87%	56.06%	54.70%	57.22%
Hydro	12.00%	6.80%	6.39%	7.73%	6.70%	5.93%	7.88%	7.06%
Geothermal + Other New and Renewable Energy ("NRE")	3.00%	5.20%	4.96%	4.58%	4.55%	4.54%	4.58%	5.09%

Figure 12. The Trend of Fuel Mix for Power Generation
Source: PWC Power Guide 2018.

By incorporating AFOLU sector, there were 18 key source categories identified and dominated by FOLU sector. The first four main categories are (i) peat decomposition, (ii) forest remaining forest, (iii) lands to cropland, and (iv) energy industries with cumulative emissions of 1,457,774 Gg CO2e or 51.59% of the total emissions. Whilst, by excluding FOLU (including peat fire) sector, there were 15 identified key sources. The first three main categories are (i) energy industries, (ii) transportation, and (iii) manufacturing industries and construction, with cumulative emissions of 822,326 Gg CO2e or 60% of the total AFOLU emissions.

Furthermore, in terms of biodiversity, in 2016, BAPPENAS has developed the Indonesian Biodiversity Strategy and Action Plan: 2015:2020[22]. Biodiversity is interrelated and needs one to another in order to grow and breed and to form a life system; the ecosystem, the species, and the genetic biodiversity. Indonesia has about 19 natural ecosystem diversity in various areas from Sumatra to Papua, divided into 74 vegetation types located in almost all bioregions in the country.

Following its various ecosystem in the country, Indonesia was estimated to have 51% of the total coral reefs in Southeast Asia covering 51,000 km2. However, only 6.5% of coral reefs were still in very good condition and 22.5% were in good condition, while the remaining can be categorized in medium and bad states. In terms of coral reef diversity, Indonesia had around 590 hard coral species (from 82 families), 210 soft coral species, and 350 gorgonian species. Following its rich diversity of coral reefs, Indonesia was also estimated to have 243 species mangroves, classified in 197 genera and 83 families, of the 268 mangrove species in Southeast Asia, with the species diversities recorded in mangrove ecosystems were different from one island to another.

Moreover, as of 2016, Indonesia had around 840 lakes and 735 small lakes with a total extent of around 491,724 hectares. About 521 lakes of total had an extent of more than 10 hectares, spread mainly in Sumatra, Sulawesi, Kalimantan and Papua, include three of the 20 deepest lakes in the world. The widest lake in the country is Toba Lake (110,260 ha) while the smallest, deepest lake is Matano Lake with more than 600 m depth. Indonesia also has thousands of rivers forming the river ecosystem spread on the islands of the archipelago country. Among others, in 2016, there were 10 longest rivers; namely:

22 BAPPENAS, 2016: *Indonesian Biodiversity Strategy and Action Plan: 2015-2020*

a. Kapuas River, West Kalimantan (1,143 km),
b. Mahakam River, Kalimantan (920 km),
c. Barito River, Kalimantan (909 km),
d. Batanghari River, Sumatra (800 km),
e. Musi River, Sumatra (750 km),
f. Mamberamo River, Papua (670 km),
g. Bengawan Solo River, Java (548 km)
h. Digul River, Papua (525 km),
i. Indragiri River, Sumatra (500 km), and
j. Seruyan River, Kalimantan (350 km).

The river ecosystem contributes to biodiversity and distribution of surface water for people in Indonesia. In many places in the country, cities and villages are located in the river banks and watershed areas. A study by Asian Development Bank[23](ADB) in 2016 indicates that Indonesia has almost 8,000 watersheds or *"Daerah Aliran Sungai" (DAS)* managed in 131 river basins. The water quality of rivers and lakes in Indonesia was poor, that over 50% of the parameters, such as biological oxygen demand (BOD), chemical oxygen demand (COD), fecal coli, and total coliform, did not meet the norms set for water quality Class I, the water standard for drinking water. It was also found that more than half of the river water samples did not meet the Class II criteria, standard water for water recreation, fresh fish preservation, livestock, water for irrigation, and other usages requiring the similar quality.

Rainwater is one of surface water sources in Indonesia. The 2016 study has cited that the average annual rainfall in Indonesia was around 2,350 millimeters per year. At national level in overall, Kalimantan Island provided 34% of the country's surface water while Papua and Sumatra Island have contributed 27% and 22% of the surface water respectively. Java, where more than 50% of the country's population living, only provided 4% of the total amount of surface water leading to water crisis in Java.

Islands	Water Availability (million m^3/year) Qaverage	Q80%	Q90%
Java	164	88.909	69.791
Sumatera	840.737	571.703	485.732
Sulawesi	299.218	184.478	154.561
Kalimantan	1,314,021	900.381	727.301
Bali and Nusa Tenggara	49.62	35.632	32.165
Maluku	176.726	132.103	117.296
Papua	1,062,154	794.496	716.443
Total Indonesia	**3,906,476**	**2,707,702**	**2,303,289**

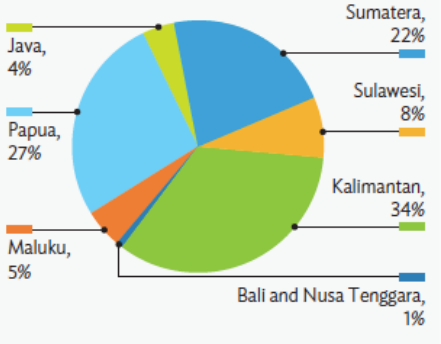


Figure 13. Surface Water Availability in Indonesia
Source: Asian Development Bank, 2016: Water Assessment 2016 pg.13

In terms of ground water, ADB also has found that there are many groundwater basins in Indonesia with potential of about 520 billion m^3/year. Assuming a 30%, ratio of safe yield, Indonesia has about 155 billion m^3/year of groundwater. Groundwater availability depends on the hydrogeological situation and the most productive groundwater basins in Indonesia can be found in the North side of Java and Sumatra Island, and toward the South side of Kalimantan and Sulawesi Island. Figure 14 below summarizes ground water availability in Indonesia in 2016.

23 ADB, 2016: *Indonesia Country Water Assessment*

Region	Number of basins	Area (km²)	Quantity (million m³/year)		
			Unconfined	Confined	Safe Yield
Sumatera	65	272,843	123,528	6,551	39,024
Java and Madura	80	81,147	38,851	2,046	12,269
Kalimantan	22	181,362	67,963	1,102	20,720
Sulawesi	91	37,778	19,694	550	6,073
Bali	8	4,381	1,577	21	479
West Nusa Tenggara	9	9,475	1,908	107	605
East Nusa Tenggara	38	31,929	8,229	200	2,529
Maluku	68	2,583	11,943	1,231	3,952
Papua	40	26,287	222,524	9,098	69,487
Total	**421**	**907,615**	**496,217**	**20,906**	**155,137**

Figure 14. Ground Water Availability in Indonesia
Source: Asian Development Bank, 2016: Water Assessment 2016 pg.20

In spite of water availability and supply described above, water pollution in Indonesia[24] is sourced from:

- Domestic wastewater:
  The wastewater from households is by far the most significant source of pollution of the surface water in Indonesia. In the urban areas, about 1% of the wastewater is safely collected and treated, and about 4% of the sewage is safely collected and safely disposed or treated. In rural areas (130 million people), wastewater is neither collected nor treated.

- Industry[25]
  The Ministry of Environment and Forestry has estimated that 12,000 medium and large industries and 82,000 small enterprises are polluting surface water. The food and beverage sector contributes to about half of the pollution. Other relevant sectors are textile (20%), rubber (13%), chemicals (9%), leather (6%), paper (3%), and mining (1%). In the mining industry sector, it is estimated that about 1 million miners and peripheral workers work in the small mining sector in Indonesia. In illegal mining, the use of mercury in large amount damages both the environment and the health of the miners.

- Agriculture, husbandry, and fish farming:
  Pollution comes from the use of fertilizer (urea and triple superphosphate) and pesticides in agriculture. Waste from livestock husbandry is a significant source of wastewater. One group of cattle generates waste equal to those of five people. Water pollution comes also from improper or excessive fish feeding in the floating cages adding to the waste load as unconsumed feed accumulates on the reservoir bed.

- Solid waste and other sources:
  Unmanaged municipal solid waste pollutes water with COD, biological oxygen demand, nitrates, phosphates, and pathogen content. Other sources of pollution are urban runoff and atmospheric deposition of heavy metals and polycyclic aromatic hydrocarbons (PAHs) caused by bad air quality.

24 ADB, 2016: *Indonesia Country Water Assessment*
25 ADB, 2016: *Indonesia Country Water Assessment*

Economic impacts of water quality degradation can be identified but they are mostly difficult to quantify. Subsequently, the loss of water quality can negatively influence on health, tourism, recreation, biodiversity, fishery, agriculture, food security, production of drinking water, real estate costs near surface water areas, industrial opportunities, and pressure on groundwater.

Aside from water quality degradation, droughts and floods also have negative impacts on the environment, society and economy in Indonesia. The droughts are resulting in a late rainy season, delayed harvesting time and increased water crises. As many as 3,980 flood events between 1970 and 2011 in the country resulted in an estimated total loss of 1.1 million hectares (ha) of cropland and 65,000 kilometers of roads. Between 1980 and 2014, about 11,000 houses were damaged every year, nearly 150,000 people per year in average must be evacuated from their homes, and in average 210 people per year lost their lives due to flood events[26].

Biodiversity protection is also carried out through traditional wisdom, as known in Indonesia has hundreds of ethnics and thousands of tribes. The community of Ngata Toro in Central Sulawesi Tengah and the Baduy community in Banten province, for example, they have a clear sustainable livelihood system resulting in sustainable life products. The Mentawai community in Siberut Island is able to structure dry fields without sacrificing natural forest conservation, and even cultivate original forest fruits such as durian. The traditional Dayak community in East Kalimantan is able to establish settlements in unsuitable areas for dry fields, where more fertile land is utilized to plant rice and other food plants. The Umak Lung Dayak community in Setulang village, Malinau district, North Kalimantan, uses the Tanah Ulen concept to conserve and maintain ecosystem in order to provide fresh water and utilize forest products.

Regardless all negative issues on the country's environment, the Indonesian biological diversity has proven to contribute significantly to the national economy in various approaches. Biodiversity provides economic values in terms of consumption and production of goods, e.g. food, medicines, building materials, fiber, and fuel. Table 1. below indicates the economic contribution of biological diversity and ecosystem in Indonesia.

Table 1. Total Economic Contribution of Biological Diversity and Ecosystem

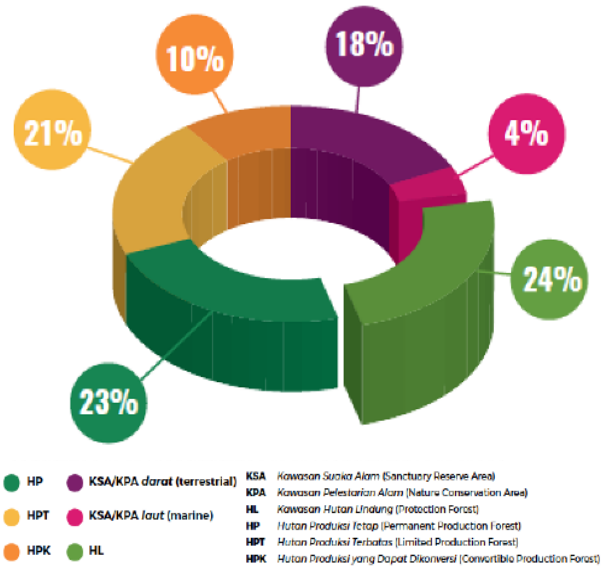
No	Type of Biodiversity Service	Biodiversity Value (in IDR, billions)
1	***Provisioning Services***	*1,680,758.1*
	Food biomass	1,338,748.5
	Material for medicines, health products, and cosmetics	4,043.9
	Wood biomass & non-wood forest products	1,081.3
	Renewable energy	336,884.4
2	***Regulating Services***	*372,473.2*
	Waste Processing	134,105.6
	Pollination	183,723.6
	Carbon capture/sequestration services	54,664.0
3	***Cultural/Tourism Services***	*602.7*
	Total	3,134,016.7

Source: BAPPENAS, "Indonesian Biodiversity Strategy and Action Plan: 2015-2020", 2016

26 ADB, 2016: *Indonesia Country Water Assessment*

In 2012, biological contribution in forms of food biomass, including crops, vegetables, fruit plants, and biomass from livestock breeding and fisheries, reached a total value of IDR1.34 quadrillion. Economic contribution from biodiversity for medicine materials, health products and cosmetics, consisting of biopharmaceutical plants about 449,300 tons, amounted to IDR 4 trillion. That was a low estimation since biopharmaceutical activities from home industries was not recorded. Economic value from biological diversity for energy, including biomass, hydrothermal, and water sources for energy, was IDR336.88 trillion. Vegetation providing varieties of wood for building, sap or resin for rubber, and other materials for the adhesive industry sector, contributed a value of IDR1.08 trillion. In overall, total biodiversity [27]value from provisioning services was amounted to IDR1.68 quadrillion

Moreover, in terms of economic contribution from biodiversity of microbes in processing the organic waste, the value was estimated to IDR134.1 trillion, excluding that of agricultural industries. Pollination services provided by biodiversity in pollinators such as bees, butterflies, birds, and insects were accounted to IDRI183.72 trillion. The role of biodiversity in pollinators is significant as nearly one-third of food production is highly dependent on the pollinators. Therefore, reduction in the population of pollinators caused by conversion in the use of forest land, as well as increased use of pesticides may cause increased failure in reproduction and in the produce of the crops.



On the other hand, forest lands with its ecosystems are important in carbon cycle, as an absorber and processor of carbon dioxide (CO2) into oxygen (O2). The forest absorbs toxic substances and processes them into oxygen. Protection of forests plays a major strategic role in protecting environmental life support systems by regulating water supplies; preventing floods; controlling erosion; preventing sea water intrusion; maintaining soil fertility; providing adequate food and energy supplies for human life; and the maintenance of germplasm (living genetic resources such as seeds or tissues that are maintained for the purpose of animal and plant breeding, preservation, and research uses).

As shown in the Figure 15 Indonesia's Forest Area [28]is categorized into three different functions: production forest (HP, 68.8 million hectares), protection forest (HL, 29.7 million hectares), and conservation forest (HK, 22.1 million hectares). Production forest area consists of Permanent Production Forest (HP), Limited Production Forest (HPT), and Convertible Production Forest (HPK). The conservation forest area is categorized into Sanctuary Reserve Areas (KSA) and Nature Conservation Areas (KPA). KSA consist of Strict Nature Reserves (CA) and Wildlife Sanctuaries (SM). KSA/KPA can be terrestrial (22.1 million Ha) or marine (5.3 million hectares). Table 2 below quantifies forest cover in and outside the Forest Area.

27 ADB, 2016: *Indonesia Country Water Assessment*
28 The State of Indonesia's Forests 2018, KLHK – July 2018, supported by FAO and NICFI

Table 2. Extent of land cover types in forest area and non-forest area in Indonesia (2017)

Land cover	Forest area[a] (in million hectare)							Non-Forest Area (APL)	Grand Total	%
	Permanent Forest					HPK	Total			
	HK	HL	HPT	HP	Total					
	(1)	(2)	(3)	(4)	(5=1+2+3+4)	(6)	(7=5+6)	(8)	(9=7+8)	(10)[a]
A. Forested	17.3	23.9	21.3	17.0	79.6	6.3	85.8	8.1	93.9	50.0
- Primary forest	12.5	15.2	9.7	4.7	42.2	2.5	44.7	1.5	46.1	24.6
- Secondary forest	4.7	8.4	11.3	9.7	34.0	3.8	37.8	5.4	43.1	23.0
- Plantation forest[b]	0.1	0.3	0.3	2.7	3.4	0.0[c]	3.4	1.3	4.7	2.5
B. Non-forested	4.8	5.8	5.5	12.2	28.2	6.5	34.7	59.3	94	50.0
Total Terrestrial Area	22.1[d]	29.7	26.8	29.2	107.8	12.8	120.6	67.4	188	100
% Forested Area[e]	**78.5**	**80.6**	**79.4**	**58.3**	**73.8**	**49.1**	**71.2**	**12.0**	**50.0**	

Source: The State of Indonesia's Forests 2018, KLHK.

In 2017 alone[29], investment in the environment and forestry sector reached IDR 148.8 trillion or USD 11 billion, with a new employment uptake of 738,000 people, an increase of 49.7% compared to 2016, when only 493,000 new forest jobs were created. This would appear to demonstrate improvements in the forest investment climate in Indonesia, as well as in the forest-related regulatory climate, and in the ease of forest businesses in their interactions with Ministry officials. As for the social forestry program, this endeavors to provide easy access to forest management for local communities, which as of June 2018 had reached a nationwide total of 1.72 million hectares of various forms of community forests, of which 74% were established between 2015 and 2018. Social forestry 27 DJPHPL, 2015. practitioners were among the recipients of community business credits *(Kredit Usaha Rakyat)* whose allocation in 2017 was in IDR 95.5 trillion or 7 USD billion. Access to lands for local communities has driven the domestic economic sector, by increasing labor absorption and the contribution of social forestry programs to the National and Sub-National GDP. A study carried out in Kalibiru, which is located in the special province of Yogyakarta, new social forestry programs were found to have contributed 6.3% to the farmers' income.

For more than five decades, forest resources have played a significant role in facilitating Indonesia's economic development. However, the performance of forest management in Indonesia has declined, and the economic contribution of forests has declined drastically, particularly since the advent of the reform era, with the associated implementation of regional autonomy policies.

The Government has now begun to introduce a number of new measures to increase the sustainability of the nation's forests, including systems for the certification of forests and chains of custody to ensure the legality of timber.

According to The State of Indonesia's Forest 2018[30], to improve the level of legal certainty in the management of Forest Areas, measures have been conducted to:

- clarify the actual boundaries and administrative designations of Forest Areas in order show the actual location and legal status of the Forest Area;
- raise public recognition/legitimation regarding community rights to the use of land in some cases inside and also in areas surrounding the Forest Area.

29 The State of Indonesia's Forests 2018, KLHK – July 2018, supported by FAO and NICFI
30 The State of Indonesia's Forests 2018, KLHK – July 2018, supported by FAO and NICFI

Indonesia's Forest Area has approximately [31]15 million hectares of peatlands, which amounts to 12% of the total, spread across the islands of Sumatra, Kalimantan, Sulawesi and Papua. This is the largest tropical peatland in the world, followed by the Democratic Republic of Congo whose peatland amounts to 9 million hectares, and the Republic of Congo: 5.5 million hectares. Indonesia's entire Peat Hydrological Unit *(Kesatuan Hidrologis Gambut, KHG)* covers a total area of 24.14 million hectares, of which 9.16 million hectares are located in Sumatra; 8.39 million hectares in Kalimantan; 6.53 million hectares in Papua; and 60,000 hectares in Sulawesi.

Peat ecosystems are defined by number of unique characteristics, including a high capacity to retain water. Thus, peat ecosystem serves as hydrological buffer zones for surrounding areas. In addition, peat ecosystems store a high level of carbon, thereby reducing the level of greenhouse gas emissions into the atmosphere. However, peatlands are also particularly vulnerable to damage if they are not managed appropriately. This damage may take the form of land subsidence, or fires if peat forests are cleared and dried (peat drainage) through the diversion of water through canals (peat canalization).

The Moratorium on the utilization of primary natural forest and peatlands is an extremely significant policy formulated by the Indonesian Government. To implement this policy, the Ministry of Environment and Forestry issued a Ministerial Decree with an Indicative Map for the Suspension of the Issuance of New Permits, for the Utilization of Forest Resources and Forest Areas and Revisions to the Designation of Forest Areas and Other Use Areas (PIPPIB; more commonly known as the moratorium map). The map covers more than 66 million hectares of mostly primary (aka 'virgin') and/or peat forests, none of which are believed to be encumbered with resource licenses (for logging, plantations, mining, etc). Within the 66 million hectares, no new resource concessions may be awarded, for as long as the moratorium is in place. The moratorium was put into force in 2011 and was recently extended by President Joko Widodo in December 2017.

Since 2015, the Government has launched an Equitable Economy (Ekonomi Pemerataan) policy to reduce inequality. The agrarian reform (Tanah Obyek Reforma Agraria, or TORA) and social forestry programs are an integral component of this Equitable Economy policy, being intended to ensure the availability of land for members of local communities and/or Adat communities. The allocated land for TORA is 9 million hectares, where the status will be changed from Forest Area to APL.

The use of land for economic activities has resulted in disturbance to forest security in the forms of encroachment, illegal logging, forest and land fires, and illegal trade in plants and wildlife. The Indonesian Government is equipped with a number of legal instruments to address these issues and uses both preventative and repressive measures. Work continues to clarify the boundaries between different administrative classifications of Forest Areas; to clarify the legal status of certain Forest Areas; to ensure public legitimacy and recognition; and to provide greater certainty regarding land rights for communities in areas adjacent to the Forest Area.

According to Environment Statistics of Indonesia 2017, despite the predetermined function of forest areas, in reality the forests are exploited unsuitable or exceeded their designation. Below are some pressures on forest area in Indonesia.

- Increased wood production annually puts pressure on forests as the main raw material provider of this industry. Many logging concessions granted timber harvesting by selective logging systems violate traditional patterns of tenure or land use rights. Lack of monitoring of forest management causes many production forests that have been overexploited. Many logging concession areas fall into the "already degraded" category and allow planters to apply for

31 The State of Indonesia's Forests 2018, KLHK – July 2018, supported by FAO and NICFI

forest conversion permits. Furthermore, the forest will be cleared and converted into industrial plantation or plantation forest.

- Industrial timber estates (HTI) have converted natural forests massively in an effort to meet pulp export requirements. HTI that has been logged out, replanted and within 8 years able to regenerate so completely replace the supply of natural forest. However, from the evaluation of HTI development to 1997 indicates that since it was developed in 1990, the realization of new planting reached 23.1% of the plan (Kartodihardjo, 2000) and the rest into abandoned and unproductive open land or exploited into other functions. This indicates, in the year of production of wood industry that continues to increase does not come from the regeneration of planting HTI. Some production still relies on natural forests as raw materials obtained by legal or illegal means.

- Palm oil plantations play an important role in the conversion of natural forests. The high production and demand for palm oil exports coincided with the addition of planted areas of commercial plantations and the reduction of the area of natural forests. The area of palm oil plantations in Indonesia over the last five years shows a significant increase compared to the extent of planting other types of plantation commodities. The average increase of palm oil plantation area for 5 years reaches 5.90% per year, and the highest achieved in 2012-2013 which grows by 9,32% or 892,3 thousand hectares. In 2011 Indonesia's palm oil plantation area was recorded at 8.99 million hectares, increasing to 11.30 million hectares or 25.66% in 2015.
- Deliberate burning by large-scale plantation owners to clear land, resulting in large, uncontrolled fires. In 2015, the largest forest fires occur in Kalimantan Tengah reaching 122,883 hectares and then 30,985 hectares Sumatera Selatan, while Jambi, Kalimantan Timur, Lampung and Sulawesi Utara, each forest fires over 18,000 hectares. Part of this area grows back into shrubs, partly used by small-scale farmers, but little systematic effort is made to restore forest cover or develop productive agriculture.

- Other pressures such as: poor forest management; changes in population consumption patterns; population growth and food need; and pressure on the mining and energy sectors

Forest and land fires in Indonesia have attracted global attention since the devastating fires of 1982/1983 and in 1997/1998. Significant forest and land fires occurred again in 2007, 2012 and 2015. In the aftermath of the disastrous fires of 2015, President Joko Widodo has reaffirmed Indonesia's commitment to preventing fires with the intensity and effectiveness of such efforts escalating year-on-year.

In 2016, the President explicitly emphasized the importance of prevention systems, systems of reward and punishment, and the importance of improving field reviews, law enforcement and synergies between central and local government agencies, and in peat land management.

In 2017, the President emphasized the importance of early warning systems and called upon all elements of society to play a role in preventing forest and land fires through participation and support for air operations, law enforcement, effective forest and land governance, and improved coordination and synergy.

In 2016 and 2017, the number of identified hotspots and cases of forest and land fires declined significantly, with this decline attributable to both intensified control measures and to climatic factors.

In 2018, the President once again called on all elements of society to play a role in the prevention of forest and land fires through participation in early warning systems, improved synergies between all stakeholders, compliance with obligations, and full participation at the community level.

Indonesia plays an active role in forums to foster global cooperation to address this issue, particularly forums associated with the United Nations Framework Convention on Climate Change (UNFCCC). As a manifestation of its commitment to managing climate change, Indonesia has committed to a Nationally Determined Contribution (NDC) to unconditionally reduce GHG emissions by 29% through its own efforts (and up to 41% depending upon levels of international assistance) during the decade of 2020 to 2030, as measured against a 2010 business-as-usual baseline. The most significant reductions will be achieved in the forestry sector, with the sector accounting for 17.2% of the 29% reduction, and 23% of the 41% reduction.

In response to guidance from the UNFCCC on how to reduce emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks (REDD+), Indonesia has developed a REDD+ infrastructure, consisting of a REDD+ national Strategy, a national Forest Reference Emissions Level (FREL), a National Forest Monitoring System (NFMS), and a Safeguards Information System (SIS).

A national Monitoring, Reporting and Verification (MRV) system for REDD+ implementation that is supported by the NFMS has also been developed. In addition to its support for REDD+ implementation, Indonesia has erected a system for results-based payments and related instruments.

Finally, as a part of the implementation of a transparency framework in the context of an agreement reached at the Paris Conference of Parties (COP), and the codification of that agreement into Indonesian national law, the government has built a "National Registry System on Climate Change" (NRS CC/SRN), for collecting information on all activities undertaken in support of climate change adaptation and mitigation, and presenting this information in a way that is clear, transparent and understandable.

2.3 Social Profile

Indonesia is a big nation with about 17,504 islands[32], 1.89 million square kilometers, and projected to have 271 and 285 million population[33] by 2020 and 2025, respectively. However, more than 50% of population lives in Java Island. As the island area is only 6.75% of the total area of the country, it has resulted highly-concentrated population, economic activities, and exploitation of natural resources in Java more than those of other islands. In terms of population by gender, about 51% Indonesia population in 2017 were females[34]. Indonesia population was also dominated by young people aged 5-9 years old, leading to demography bonus for the country in the future. About 67% of population in 2017 was at productive age of 15 to 64 years old.

In terms of poverty, Indonesia has successfully recorded a poverty rate at 9.66%[35] by end of 2018, lower than 10.12% in 2017 and the lowest since the 1998 monetary crises. The biggest poverty rate was in Papua and West Papua at 27.43% and 22.66%, respectively. However, as more than half of

32 Badan Pusat Statistik, 2016: *https://www.bps.go.id/statictable/2014/09/05/1366/luas-daerah-dan-jumlah-pulau-menurut-provinsi-2002-2016.html*
33 Badan Pusat Statistik, 2014: *https://www.bps.go.id/statictable/2014/02/18/1274/proyeksi-penduduk-menurut-provinsi-2010---2035.html*
34 Badan Pusat Statistik 2017: *Perempuan dan Laki-laki di Indonesia 2017*
35 Badan Pusat Statistik, 2018: *https://www.bps.go.id/dynamictable/2016/08/18/1219/persentase-penduduk-miskin-menurut-provinsi-2007---2018.html*

Indonesian population were in Java, such condition has created social and economic inequalities leading to, among others, the high poverty cases or high number of people living under poverty line in the island. In line with that, in terms of numbers, Java indicates the biggest portion of Indonesian poverty cases in 2018. The highest was 4.31 million cases in East Java, while Central Java was 3.87 million cases, and West Java recorded 3.34 million cases or poverty. As per statistic data of March, 2018[36] released by the Indonesian Statistic Centre Body, rural poverty was 13.20%, higher than that of urban poverty rated at 7.02%. That indicates relatively a big gap at 5.18%. Rural poverty line was IDR383,908 per capita as of March 2018, while urban poverty line in the same period was set at IDR415,614 per capita. Food commodities have contributed about 70-75% portion to poverty line, while 25%-30% came from non-food commodities in both rural and urban setting. It means that poverty line is likely affected by food commodities resulting higher or lower poverty rate. As of 2018, life expectancy of Indonesian people in average of 69.3 years. Males have less life expectancy at 67.3 years while the females life expectancy is at 71.4 years[37]. In terms of infant mortality, according to UNICEF, under-5 mortality rate in 2017 was 25.4 per 1,000 live birth[38].

As per February 2017 – February 2018[39], the labor force participation rate for man are decreasing from 83,05% to 83,01%. Whereas for woman are increasing from 55,04% to 55,44%. According to the OECD Social Institutions and Gender Index (SIGI), [40] the latest SIGI 2014, Indonesia presents medium levels of discrimination against women, ranking 53 out of 108.

Data from the National Statistic Body[41] indicates that Indonesian workforce as per end of August 2018 was 131.01 million, higher 2.95 million people than that of August 2017. Out of that number, about 124.01 people had jobs while 7 million were unemployed. Labor force participation rate in August 2018 was recorded at 67.26%, increased about 0.59% than that of previous year in the same month. The increase has indicated the raise of manpower supply to the national economy. By gender, male participation rate was 82.69% while participation rate of female to the workforce was at 51.88 rate. However, compared to the 2017 data, female participation rate was at 0.99%, higher than that of male at 0.18%. It pointed out that female participation rate was getting better and more women had job opportunities in both formal and informal sectors.

In education, Indonesia has reached a literacy rate at 97.93%[42] in 2016. Net Enrolment Ratios[43] in 2017 for junior and senior school level were at 78.40% and 60.37%, respectively. However, total number of officially-registered college students was relatively low, only 6,924,511 students as of 2017[44], less than 5% of total population. In line with that, Indonesia has recorded a Human Development Index value of 0.694[45] for 2017, which made the country ranked at 116 out of 189 countries and territories.

36 Badan Pusat Statistik, 2018: *Profil Kemiskinan di Indonesia Maret 2018 No. 57/07/Th. XXI, 16 Juli 2018*
37 https://www.worldlifeexpectancy.com/indonesia-life-expectancy
38 https://data.unicef.org/country/idn/
39 http://www.turc.or.id/wp-content/uploads/2018/06/BPS_Berita-Resmi-Statsitik_Keadaan-Ketenagakerjaan-Indonesia-Februari-2018.pdf
40 SIGI is a database on discriminatory social institutions holding women back from fully participating in society, launched in 2009 by OECD. The database is accompanied by in-depth country profiles for over 160 countries spanning all regions, including Indonesia.
41 *Badan Pusat Statistik, 2018: Keaadan Ketenagakerjaan Indonesia Agustus 2018, No.92/11/Th.XXI, 5 November 2018, Badan Pusat Statistik, 2018*
42 Badan Pusat Statistik, 2018: *https://www.bps.go.id/dynamictable/2018/07/24/1545/angka-melek-aksara-penduduk-umur-15-59-tahun-menurut-daerah-tempat-tinggal-2015-2016.html*
43 Badan Pusat Statistik, 2015: *https://www.bps.go.id/dynamictable/2015/12/22/1052/angka-partisipasi-murni-apm-menurut-provinsi-2011-2017.html*
44 Kementerian Risat, Teknologi, dan Pendidikan Tinggi, 2017: *Statistik Pendidikan Tinggi 2017*
45 UNDP, 2018: *Human Development Indices and Indicators: 2018 Statistical Updates*

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3

RELEVANT POLICIES AND INITIATIVES

3 RELEVANT POLICIES AND INITIATIVES

The following section reviews relevant initiatives, policies and regulations relevant for green economy transition in Indonesia. Firstly, the Low Carbon Development Initiative is presented, followed by sectoral policies and regulations. Policy gaps based on the Green Growth Policy Review of OECD (2019) are presented followed by policy recommendations.

3.1 Low Carbon Development Initiative (LCDI)

The current effort of the Government of Indonesia to mainstream low carbon and green economy in the national development planning is mainly realized through the Low Carbon Development Initiative (LCDI). The initiative, led by the Ministry of National Development Planning, BAPPENAS, involves mainstreaming of LCDI policy scenarios into Indonesia's National Mid-Term Development Plan (RPJMN) 2020-2024. The work is mandated by the Government Regulation (PP) 46/2016 on Strategic Environmental Assessment (SEA), in this case the assessment of policies, plans and programs with respect to environmental conditions will be integrated into the RPJMN 2020-2024.

The LCDI model is built upon New Climate Economy (NCE) findings in its 2018 global report, where bold climate actions can deliver US$26 trillion in economic benefits. That includes creating economic diversification and quality jobs (new jobs and green jobs) and providing better health outcomes globally within period of current time to 2030 compared to those of business-as-usual practices[46]. Presuming that Indonesia case will be no exception of that pattern, BAPPENAS then has started collaborative efforts supported by various development partners to conduct analytical works in developing the LCDI model via its technocratic process for RPJMN development[47].

LCDI aims to explicitly incorporate the environmental considerations (carbon emissions reduction targets and carrying capacity) into the development planning framework which will shape the economic and social trajectories. Given the objective, LCDI is developed upon five core principles: (1) evidence based using multi-discipline approach; (2) incorporating carrying capacity as the consideration in target setting; (3) employing trade-off-based policy analysis to balance economic and social development with climate actions aim; (4) implementing holistic, integrated, thematic, and spatial principles; and (5) actively engage development and environmental stakeholders.[48]

46 New Climate Economy, 2018: *https://newclimateeconomy.report/2018/key-findings/*

47 *Based on interview with NCE Lead Economist and BAPPENAS representative, the LCDI Phase 1 Report supported by NCE is planned to be released at the end of March 2019. The report will elaborate the system dynamic model for Indonesia Vision 2045 (baseline model) and investment model for LCDI.*

48 BAPPENAS, 2019*: Public Consultation for Strategic Environmental Assessment (KLHS)*

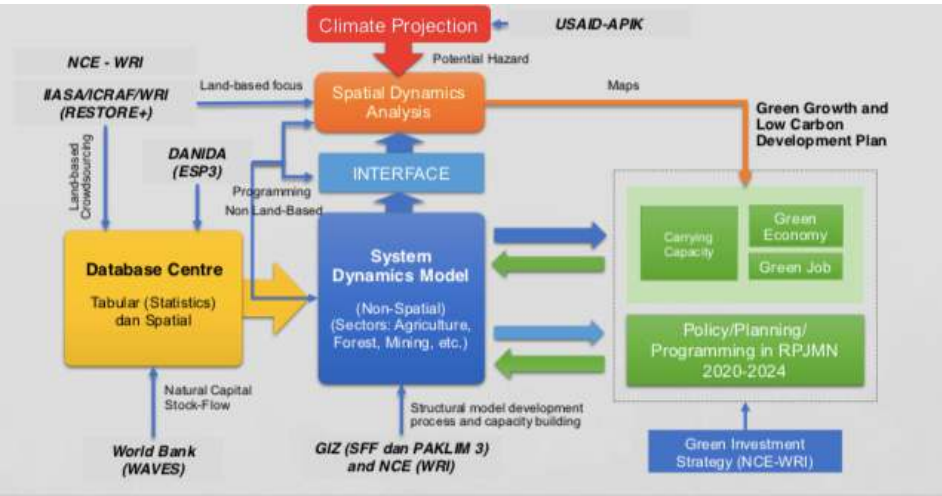

Figure 16. Methodology & Model Integration Process for KLHS and RPJMN 2020-2024
Source: Baseline and Initial Policy Recommendation, BAPPENAS, 2018

In particular, LCDI employs system dynamics modelling to build the baseline model, known as Indonesia Vision 2045,[49] for technocratic design. The system dynamics in LCDI is a descriptive model aiming at understanding the main drivers for the behavior of the system and the provision of information on what would happen in case a policy is implemented at a specific point in time and within a specific context. This approach is not new as it is aligned with UNEP's guidelines[50] and previously has been employed within limited scope such as in Indonesia Green Economy Model (I-GEM) development supported by UNDP's Low Emission Capacity Building Programme (LECB) in partnership with the President's Delivery Unit for Development and Oversight (UKP4) and BAPPENAS.[51]

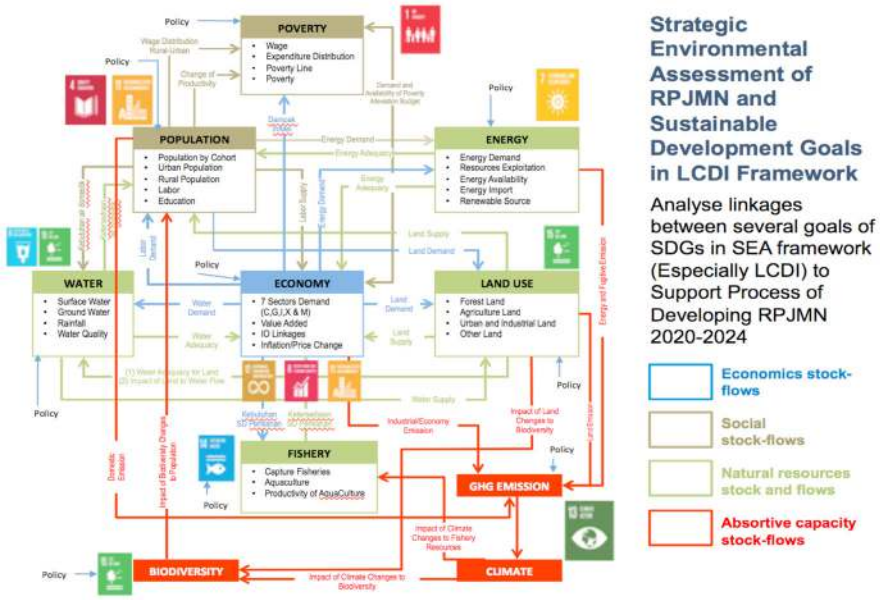

Figure 17. The Indonesian Vision 2045: Baseline Model for LCDI
Source: Public Consultation for Strategic Environmental Assessment (KLHS), BAPPENAS, 2019

49 BAPPENAS, 2018: *Indonesia 2045*
50 UNEP, 2014: *Using Models for Green Economy Policymaking*
51 LECB Indonesia, 2015: *Indonesia Green Economy Model (I-GEM)*

LCDI phase 1 addresses modelling of development policies which cover six primary inter-related human activities in social and economy, namely in energy, industry, agriculture, forestry, housing, and fisheries sectors, that affect and supported by environmental carrying capacity. Within analysis, the inter-related human activities are captured by three parameters covering sectoral targets, economy, and poverty, traded off with environmental carrying capacity proxied by emission intensity and carbon emission.[52]

The model provides development scenarios where the low carbon and inclusive green economy growth path can deliver an average GDP growth rate of 6% annually until 2045. Along the lines, it would unlock an array of economic, social and environmental benefits including reducing extreme poverty, generating additional better-paid jobs, and avoiding deaths due to reduced air pollution. As the consequences, through the sustainable utilization of its natural resources, and by reducing its carbon and energy intensity, Indonesia's total GHG emissions can fall by nearly 43% by 2030. These promising results can be achieved by prioritizing related policies in energy and land-use. To achieve this, several immediate targets that were suggested by the models includes advancing a transition to renewable sources of energy, increasing energy efficiency, a full enforcement of forests, palm oil, mining and peat land moratoria, abiding to committed targets in water, fisheries and biodiversity, and increasing land productivity by 4% per year.[53]

3.1.1 System Dynamics Modelling as LCD Planning Tool

Based on the IV2045 model[54], BAPPENAS had simulated various scenarios using business as usual (BAU) condition compared to introducing the LCDI policy scenarios within the model. Given the current assessment, LCDI moderate and high ambition scenario put focus on four group of policies namely:[55]

1) Those referring to forests and land use, addressing the fundamental need to preserve primary forests and other forest areas, along with water, fisheries and biodiversity, while also enabling the provision of income and employment for the majority of population and sectors that depend on primary resources;
2) Those aiming to improve the productivity of land;
3) Those referring to the transition toward renewable sources of energy for a reduction in the country's carbon intensity; and
4) Those focusing on the reduction of energy intensity by means of reducing waste and improving efficiency of energy systems

The simulation concludes that current development policy is still unsustainable which may result in decreasing economic growth when carrying capacity is taken into consideration; therefore, low carbon development and green economy is imperative to sustain growth while preserving targeted carbon emission through LCDI. In particular, with regards to Government targets on SDGs, NDCs, and economy the LCDI scenario is expected to provide the following results:

LCDI and Commitment towards SDGs

LCDI model incorporates three main pillars namely economy, social, and environment. In terms of the commitment of Indonesia in attaining the Sustainable Development Goals

52 BAPPENAS, 2019*: Public Consultation for Strategic Environmental Assessment (KLHS)*
53 BAPPENAS and New Climate Economy, 2019: Low Carbon Development: A Paradigm Shift towards a Green Economy in Indonesia
54 IV2045 is a System Dynamics model that integrates a set of feedback structures for the macro economy, society, and a representation of natural capital including energy, land, water resources, biodiversity and carbon emission systems in Indonesia. It is a model that falls into the category of Integrated Assessment Methods (IAM) that enables a coherent, comprehensive appraisal of social, economic, and environmental policies, including low carbon policies.
55 BAPPENAS and New Climate Economy, 2019*: Low Carbon Development: A Paradigm Shift towards a Green Economy in Indonesia*

(SDGs), the interlinkage between LCDI model and the SDGs for each corresponding pillar is as follow:

Table 3. Interlinkage of LCDI's Parameters and SDGs

LCDI's Pillars	LCDI's Parameters	Related SDGs
Economy	Energy availability, energy demand, electricity capita, energy intensity, share in renewable energy (RE),	Affordable Clean Energy (7)
	GDP, GDP growth, GDP per capita, workforce, unemployment rate, labour, salaries	Decent Work and Economic Growth (8)
	Industry sector value added, industry share in GDP, proportion of labour in industry sector, CO_2 emission from industry per value added from industry sector, potential of increasing ocean-wave height	Industry, Innovation, and Infrastructure (9)
	Non-oil and gas export growth	Partnerships for the goals (17)
Social	Number of poor people, poverty level, urban-rural poverty	No poverty (1)
	Added value from agricultural per number of labors working in agriculture industry sector	No hunger (2)
	Mean year of schooling	Quality Education (4)
Environment	Land built consumption per urban population ratio, energy consumption for transportation industry sector	Sustainable cities and communities (11)
	Surface water quality, water availability	Clean water and sanitation (6)
	Domestic solid waste growth rate	Responsible consumption and production (12)
	Carbon emission, carbon emission intensity, coastline vulnerability, flood and drought potential	Climate action (13)
	Total production of captured and cultivated fisheries, maximal sustainable yield	Life below water (14)
	Proportion of forest cover to total land, proportion of palm oil plantation land size per island, critical and protected biodiversity site, degraded or critical land to total land area, burned peatland area	Life on Land (15)

Source: BAPPENAS, Baseline and Initial Policy Recommendation, 2018

LCDI and Climate Actions Commitment

To align with Indonesia's Nationally Determined Contribution (NDCs) under the Paris Agreement, the development plan should attain carbon emission reduction target by 29% unconditionally and 41% conditional on receiving international supports, both relative to a BAU by 2030. The commitment set by the Government looks audacious considering that Indonesia has been recorded as the 4th highest emitter in the world after China, USA, and India[56]. Thus, a policy reform is needed to make a leap in order to meet the commitment.

With respect to the NDC, the LCDI model incorporates outcome measurement using two parameters: carbon emission intensity and reduction. Given current data and model scenario using fair or moderate assumptions, BAPPENAS has indicated that compared to those of baseline, combination of policies provided by LCDI approach may result in[57] :

- emission reduction 29%-42% in 2030 which largely contributed from the land and energy sectors, and
- emission intensity reduction 33%-46% by 2030 and 44%-51% by 2045.

56 WRI, 2017: *NCE draft of report based on CAIT: Climate Data Explorer*
57 BAPPENAS, 2019: *Public Consultation for Strategic Environmental Assessment (KLHS), 2019*

Economics Trajectories under LCDI Model

Using the BAU projection without incorporating the LCDI policies recommendation, Indonesia's economic growth captured by GDP per capita will increase by 5,1% - 5,3% annually within the period of 2017 – 2030 and further increase approximately by 5,5% until 2040 to further decrease to 5,1% by 2045 due to development constraint provided by unsustainable approaches. However, the LCDI model shows that by implementing the combination of policies suggested by the model, Indonesia may reap economic growth approximately by 7% of GDP/capita annually until 2030 and further increase to 23% by 2045. [58]

In addition to the growth rate, the LCDI policy recommendations supports the shift towards renewable energy. By including targets for the use of biofuels in the transportation sector; moderate and high scenario of LCDI target to substitute fuel oil demand by 14% and 30% in 2025 respectively would therefore reduce the government expenditure on fuel oil subsidies which may provide fiscal savings amounting to 42.5 million US$ in 2030 (0.64% of GDP in the period) and up to nearly 120 billion US$ (0.54% of GDP) by 2045.[59]

At the other end, the LCDI scenario is expected to increase the employment ratio (measured as the number of workers divided by the size of the labour force) by providing additional 15,3 million jobs by 2045 relative to the BAU. The LCDI Scenario brings not only a higher level of employment but also a shift in the structure of employment, with a higher fraction of population engaged in low carbon sectors and a lower fraction of workers depending upon primary-based activities. Under the LCDI Scenario there are 2.5% less workers engaged in primary activities relative to the BAU. This is about 4.1 million people that do not need to rely on primary activities for their main source of income, given the higher productivity in the agriculture sector and the deeper structural transformation that is estimated under the LCDI Scenario.[60] With the economic and employment trajectories bring about by LCDI scenario, the condition yields in higher gains in terms of number of people lifted out of poverty. By 2045, it is projected that only about half a million people out of 318 million population remain in poverty his compares to about 3 million people living in poverty under the BAU.[61]

A low carbon economy is built on sustainable infrastructure. This needs to be accompanied by an ambitious scaling up and diversification of sources of green finance towards low carbon sources of energy. It also requires the protection and restoration of valuable natural infrastructure, such as wetlands and forests, including peat land systems and mangroves. These tools spur resource efficiency and technological progress, leading to a long-lasting boost in productivity.[62]

To deliver such favorable economic and social trajectories, LCDI model encompasses particular development policies which are expected to become the key leverages to yield the desired outcomes. The high case scenario assuming an advance transition towards renewable energy by scaling up its contribution from about 8% in 2015 up to 23% in 2030 and 30% in 2045 by curbing coal dependency. Detailed LCDI development scenarios are described in Table 4 below.

58 BAPPENAS, 2019: *Public Consultation for Strategic Environmental Assessment (KLHS), 2019*

59 BAPPENAS, 2019: *Public Consultation for Strategic Environmental Assessment (KLHS), 2019*

60 BAPPENAS and New Climate Economy, 2019: *Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia*

61 BAPPENAS and New Climate Economy, 2019: *Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia*

62 BAPPENAS and New Climate Economy, 2019: *Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia*

The transition may yield in the decrease of energy to population intensity by 3.5% in 2030 and 4,5% in 2045 relative to 2018 ratio. Such transition will also be expected to have an impact on fiscal policies on fossil fuel energy, such as the coal subsidy. As Indonesia will use more renewable energy, coal subsidy will be less. A study by International Institute for Sustainable Development[63] identified 15 policies that are considered to provide a subsidy to the coal industry. The amount of subsidy was predicted to reach at USD 946.1 million (IDR 12.4 trillion) in 2014 and USD 644.8 million (IDR 8.5 trillion) in 2015. There are four categories of coal subsidy; (1) direct and indirect transfer of funds and liabilities, (2) government revenue forgone, (3) provision of goods and services below market value, and (4) income or price support.

With respect to the carrying capacity, the scenario suggests a full enforcement of forest, palm oil, mining, and peat land moratorium to preserve 41.1 million ha of primary forest which includes 15 million ha of peat land; while also abiding to committed target in water, fisheries, and biodiversity as defined by the Aichi Targets (global targets to reduce the loss rate of biodiversity), the Nagoya Protocol (which regulates access to genetic resources and the fair and equitable sharing of benefits arising from their utilization) and the Convention on Biological Diversity, that are reflected in the Indonesia Biodiversity Strategy and Action Plan (IBSAP) 2015–2020.

Table 4. LCDI Development Scenarios[64]

Base Case Scenario	Moderate Scenario	High Scenario
The scenario reflects the continuation of previous practices and no new policy introduction which results in the environmental degradation	· The scenario is aligned with Indonesian unconditional NDC where by 2030 there would be 29% reduction of carbon emission. · It will require additional investments at an average of US$14.8 billion per year in 2020-2024 (about 1.15% of GDP), and US$40.9 billion per year in 2025-2045 (1.39% of GDP). · The policy undertaken will prioritize on energy and land system. The policy includes here namely a full and immediate enforcement of forests, peat land, mangroves, and mining moratoria, forest restoration; adoption of agriculture productivity enhancement, other food and waste reduction policies; the acceleration in the pace of reduction in energy intensity, and the movement towards meeting renewable energy targets that have already been defined in Indonesia's energy policy.	· The scenario includes more ambitious policy measure to attain the conditional NDC target and lead to 43% emission reduction by 2030. · It will require additional investments relative to the Moderate Scenario. Total average LCDI Moderate Scenario per year are: US$22.0 billion (1.7% of GDP) for the period 2020–2024; and US$70.3 billion (2.34% of GDP) for the period 2025-2045. · Meeting the conditional NDC requires meeting all the actions in LCDI Moderate Scenario, plus the scaling up of efforts in restoration, forest protection, energy intensity reduction and increase in renewable energy shares through 2045.

63 The International Institute of Sustainable Development, 2017: Financial Supports for Coal and Renewables in Indonesia, GSI Report

64 Extracted from BAPPENAS and New Climate Economy, 2019, *Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia*

3.2 Other Policies and Regulations Relevant to LCDI

The LCDI model was built as an overarching framework with multiple and intertwining social, economic, and environmental aspects. Therefore, the LCDI framework itself is related to various policies and regulations that are already enacted by the Government of Indonesia. The existing main policies related to LCDI can be summarized within sectoral categories in sections below:

1. Energy
2. Forest, Peatland and Reforestation
3. Solid Waste Handling and Industrial Management
4. Agriculture Land Productivity
5. Institutions and Governance

3.2.1 Energy Policies

The following table provides an overview of relevant policies and regulations in the energy sector.

Table 5. Energy Policies and Regulations Relevant to LCDI

	GENERAL ENERGY POLICY
2007	**Law No. 3/2007 on Energy** Principles and objectives of energy utilization in Indonesia. Energy utilization is conduct by developing energy policy through National Energy Board.
2014	**GR No. 79/2014 on National Energy Policy** National energy policy is an Energy Management policy that is based on the principles of fairness, sustainability and environmental insight to create national Energy Independence and Energy Security.
2017	**Presidential Regulation No. 22/2017** on National General Energy Plan (Rencana Umum Energi Nasional – RUEN) has set up the contribution of renewable energy within national energy plan to reach 23% by 2025.[1] RUEN also sets the target of reduction in energy intensity by 1 % annually between 2015-2050.
	ENERGY EFFICIENCY
2004	**MEMR Decree No. 2/2004 on Policy on the Development of Renewable Energy and Energy Conservation (Development of Green Energy)** This regulation describing current condition, concept, scope, opportunity, and obstacle on implementing the policy. Describing the vision, mission, policy, strategy, and programmes for the development of renewable energy and energy conservation.
2009	**GR No. 70/2009 on Energy Conservation** Energy conservation is a systematic, planned and integrated effort to conserve domestic energy resources and improve the efficiency of the utilization.
2012	**MEMR Regulation No.13/2012 on Electricity Saving** The target of electricity is to save 20% of electricity use within 6 months after this regulation published and/or achieve the minimum criteria of electricity use (specific energy consumption for air-conditioned office building less than 14 kWh/m^2/month and for non-air-conditioned office building is less than 5,6 kWh/m^2/month)
	MEMR Regulation No.14/2012 on Energy Management Energy Management is the integrated activities to control the energy consumption for achieving effective and efficient energy utilization to produce optimum output through structured and economic technical actions. The actions are for minimize the energy use including energy for production process and energy consumption of raw material and supporting material. Energy management obliged to entity that use energy amounted to 6,000 TOE.
2013	**Presidential Instruction No. 3/2013 on Energy and Water Savings,** summary of the regulation: President instructs the head of government institutions at the national and regional levels to take action and develop innovations for energy and water saving, with saving targets: 20% of electricity, 10% of subsidies oil fuel, and 10% of water.

RENEWABLE ENERGY	
2006	**Presidential Instruction No. 1/2006 on Provision and Utilization of Biofuel as Alternative Fuel** The President instructs the Coordinating Minister for Economic Affairs; MEMR; Minister of Agriculture; Minister of Forestry; Minister of Industry; Minister of Trade; Minister of Transportation; Minister of Research and Technology; Minister of Cooperative and Small Enterprises; Minister of State-owned Enterprises (BUMN); Minister of Home Affair; Minister of Finance; Minister of Environment; Governor; and Mayor/Regent according to their authorities to taking action in order to accelerate the provision and utilization of Biofuel.
2008	**MEMR Regulation No. 32/2008 on Provision, Utilization, and Trade System for Biofuel as Alternative Energy**, some of the contents of this regulation has been changed with MEMR Regulation No. 25/2013 on Article 1, 3, 5, 25, 26, 26A and 27, MEMR Regulation No. 20/2014 for Appendices, and MEMR Regulation No. 12/2015 for Appendices. Biofuel, as mentioned in the regulation, consists of Biodiesel (B100), Bioethanol (E100) and Pure Bio-Oil (O100).
2010	**President Regulation No. 4/2010 on Assignment to *PT. Perusahaan Listrik Negara* – PT. PLN (State Electricity Company) To Accelerate the Development of Power Plants Using Renewable Energy, Coal and Gas** In order to accelerate the development of power plant by using renewable energy, coal and gas, PT. PLN is allowed to cooperate with private sectors by using electricity purchasing scheme. This regulation was valid until December 2014.
2017	**MEMR Regulation No. 50/2017 on Utilisation of Renewable Energy Sources for Electricity Supply.** This regulation states that PLN is obliged to buy electricity from renewable energy (RE) power plant at a price based on the highest local electricity supply basic cost (BPP). If the BPP for electricity purchased from RE-Plant at the local level is lower than the national rates, then the tariff should be set-out in an agreement between parties. According to MEMR Decree No. 1772 K/20/MEM/2018, electricity supply basic cost (BPP) valid for 1 April 2018 until 31 March 2019 at national level is 7.66 cent US$/kWh.
2018	**President Regulation No. 35/2018 on the Acceleration of the WtE Infrastructure Development based on environmentally friendly technology.** This regulation was issued to accelerate WtE plant development for the 12 cities, including (1) DKI Jakarta Province, (2) Tangerang City, (3) South Tangerang City, (4) Bekasi City, (5) Bandung City, (6) Semarang City, (7) Surakarta City, (8) Surabaya City, (9) Makassar City, (10) Denpasar City, (11) Palembang City, and (12) Manado City
	Government Regulation No. 5/2018 on Technical Guideline of Physical Specific Allocation Fund (*Dana Alokasi Khusus* – DAK) On the Article 2 clause (2), the DAK also allocated to small scale energy sector, one of the activities are construction of renewable energy installation such as: a. Micro-hydro power plant (PLTMH) b. Centred PV-Solar power plant (PLTS); c. Distributed PV-Solar power plant; d. Biogas installation (for Household scale) According to MoF, the DAK for small scale energy sector in fiscal year 2018 is IDR 500 Billion[2]
	MEMR Decree No. 1395 K/30/MEM/2018 on Coal Domestic Market Obligation (DMO) for Public Interest The Decree define the DMO price for Coal USD 70/ metric ton Free On Board (FOB) Vessel, with the reference specification: heat value 6.322 kcal/kg GAR, Moisture 8%, Sulphur 0,8% and Ash 15%. For other Coal specification, using the price formula on the Annex 1 and 2 on the Decree

3.2.2 Forestry, Peatland and Reforestation Policies

The table below provides an overview of relevant policies and regulations in the sectors of forestry, peatland and reforestation.

Table 6. Forestry, Peatland and Reforestation Policies and Regulations Relevant to LCDI

FORESTRY, PEATLAND AND REFORESTATION	
1994	**Law No. 5/1994 on Ratification of United Nations Convention On Biological Diversity** This law is the legalization and implementation of the United Nations Convention on Biological Diversity, held in Rio de Janeiro 1992. The convention resulting in the agreement of the participated countries to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity and to integrate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.
1999	Law No. 41/1999 on Forestry Forestry is the management system with regards to forests, forest areas, and forest products which are held in an integrated manner.

FORESTRY, PEATLAND AND REFORESTATION	
2007	**Government Regulation No. 1/2017 on Tax Facilities for Capital Investments in Selected Industries and/or Provinces** Tax deductions on palm oil investments, accelerated depreciation and amortization of tangible fixed assets, lower taxes on dividend payments, loss compensation, tax exemptions and deferrals.
2008	**Government Regulation No. 76/2008 on Forest Rehabilitation and Reclamation** Rehabilitation is an effort to restore, maintain and improve the function of forests and land so their carrying capacity, productivity and role in supporting life support systems are maintained. Rehabilitation carries out for forest (exclude nature preserve and core zone of the national park) and critical land.
2009	**MoE Regulation No. 29/2009 on the Procedure of Biodiversity Conservation in Regional Level** This regulation aims to guide local government (province or city/regency) to develop their own biodiversity profile as the basis to define policies regarding to biodiversity conservation and damage prevention, conflict resolution, as well as development of information system (biodiversity database).
2011	**Ministry of Agriculture Regulation No. 19/Permentan/OT.140/3/2011 on Indonesia Sustainable Palm Oil/ISPO Guidelines** This regulation provides guidelines for palm oil plantation to perform sustainable business practices. Based on this regulation, the Government classifies palm oil plantation into Class I, II, III, and IV in accordance with their compliance to this regulation.
2014	**Government Regulation No. 71/2014 on Protection and Management of Peatland Ecosystems** The environmental protection and management shall include land for biomass production; coral reef; mangrove; seagrass bed; Peatland; karst; and/or others classified as such according to the advancement of science and knowledge. Peatland Ecosystem Protection and Management include: a. planning; b. utilization c. control; d. maintenance; e. monitoring; and f. administrative sanction.
	Law No.39/2014 on Plantation This law regulates plantation planning and practices in Indonesia, covering licensing, national and sub-national planning, partnership, and sustainable agriculture practices.
2015	**Government Regulation No.61/2015 on Collection and Use of Palm Oil Fund** This GR emphasizes that there should be a palm oil fund that can be used to support palm oil industry and biofuel development. Palm oil funds are collected from the Government, companies, financing companies, and other sources.
2016	**Government Regulation No. 57/ 2016 on Amendment to Government Regulation No. 71/2014 Concerning Peatland Ecosystem Protection and Management.** This GR emphasizes that there should be no new opening of peat, determination of criteria for protected functions, water level, sanctions and recovery. Anyone/party who burns or omits fire on peatland will be sanctioned, a prohibition for everyone to open new land until the zoning of peat function is determined. Not only that, anyone is prohibited from making drainage channels that may cause peat to dry out, burn peatlands and allow fires.
	President Regulation No. 24/2016 on Collection and Use of Palm Oil Plantation Funds Palm oil company are required to pay levies on exports and production of palm oil, the number of levies determined by the ministry of finance and collected by the Fund Management Agency formed by the national government. The levies will be used for the development and research of palm oil production, and also to cover the gap between the market index price of diesel fuel oil and the market index price of biodiesel biofuels (subsidy)
2017	**Presidential Instruction No. 6/2017 on Moratorium of New Licenses and Improvement of Governance for Primary Natural Forest and Peatland (the extension of Presidential Instruction No. 8/2015)** The instruction is intended to continue the moratorium of new licenses for primary natural forests and peatlands, based on the Indicative Map of Moratorium of New Licenses which will be updated every 6 months.
	MoEF Regulation No 40/2017 on Government Facilitation on Industrial Plantation Forests is intended to protect and manage the peat ecosystem. For those Industrial Plantation Forests (HTI) located in the peat ecosystem that do not perform well, licenses may be revoked, or adjustments may be made in order protect peat ecosystem protection functions *(Fungsi Lindung Ekosistem Gambut or FLEG)*
	MoEF Regulation No. 70/2017 on Procedure for the Implementation of Reducing Emissions from Deforestation and Forest Degradation, Role of Conservation, Sustainable Management of Forest and Enhancement of Forest Carbon Stocks This regulation aims to achieve the implementation of REDD+ in line with COP UNFCCC on REDD++ and consistent with national policy, and encourage the REDD+ actors to lead full implementation of REDD+ (*result based payment*), in order to support the achievement of NDC target. The scope of REDD+ is national, with the implementation on the Sub-National Area (Regional). The implementation of REDD+ is conducted by reducing the emission from forest deforestation and degradation, forest carbon stock conservation, sustainable forest management, and improving forest carbon stock. REDD+ is carried out gradually and is directed to full implementation by applying a result-based payment.
	Grand Design of Fire Prevention on Forest, Plantation and Land, MoEF & Bappenas 2017 The idea of this Grand Design is to give incentives for zero burning land clearing.

FORESTRY, PEATLAND AND REFORESTATION	
2018	**Presidential Instruction No. 8/2018 on Moratorium and Evaluation on Palm oil Plantation License and Improvement of the Palm oil Plantation Productivity** In order to implement the moratorium and evaluation of Palm oil Plantation, the president instructs 6 ministries, national investment board and local government to conduct some specific activities. The activities that needs to be conducted to support the moratorium and evaluation ofpalm oil plantations are, among others: Verifying palm oil plantation sites; Synchronizing related policies and licenses on palm oil plantation with regard to one map policy. Carrying out the development of High Conservation Value Forest (HCVF) from the release of forest land for palm oil plantations.

3.2.3 Waste and Industrial Management Policies

The table below provides an overview of relevant policies and regulations in the waste management sector.

Table 7. Waste and Industrial Management Policies and Regulations Relevant to LCDI

SOLID WASTE MANAGEMENT	
2008	**Law No. 18/2008 on Solid Waste Management** Solid waste management is divided into two fundamental activities, namely waste reduction and waste handling. Waste minimisation is divided into the following activities: reduction of waste at source, reuse of waste at source, and recycling of waste at source (3R principle - reduce, reuse, recycle). In a similar approach, waste handling is split into the following activities: separation, collection, transportation, treatment, and final processing (landfilling) at the final disposal site. In the context of waste reduction, this regulation also adopted the Extended Producer Responsibility (EPR) principle such as production processes and packaging design should meet the environmental criteria.
2012	**GR No. 81/2012 on Household and Household-like Solid Waste Management** This regulation is a more detail version of Law No. 18/2008, which specifies on waste reduction and waste handling activities, technical requirement, and so on. For waste sorting, this regulation is divided into 5 categories namely (1) hazardous waste – red label, (2) putrescible waste – green label (organic), (3) reusable waste – yellow label, (4) recyclable waste – blue label and (5) residues – grey label.
2013	**MoPW Regulation No. 3/2013 on Implementation of Solid Waste Infrastructure and Facilities in Handling Household and Household-like Solid Waste** This regulation provides technical guidelines for general planning, waste handling infrastructure, provision of facilities for treatment and final processing of solid waste, and landfill closure/rehabilitation.
2016	**MoEF Regulation No. P.59/Menlhk/Setjen/Kum.I/7/2016 on Leachate Quality Standard from Landfill Processing Activities** This regulation aims to give reference to the governor, environmental licensing officials, and the institutions that conduct landfilling activities based on the Leachate Quality Standard.
2017	**President Regulation No. 97 Year 2017 on National Policy and Strategy for Household and Household-like Solid Waste (Jakstranas)** The policy and strategy of this regulation is to be implemented by the year 2025. One goal is that waste reduction at source should attain 30% of the generated waste by 2025. Besides, for the remaining 70% the waste, all the waste should be properly handled by 2025.
2018	**MoEF Regulation No. P.10/MENLHK/SETJEN/PLB.0/4/2018 on Procedures on the Development of Regional Policy and Strategy for Household and Household-like Solid Waste (Jakstrada)** The regulation aims to provide guidance to regional governments (provincial and city/regency) on the development of Jakstrada as the implementation document for regional level for solid waste management. The Jakstrada must refer to Jakstranas, which has the target of 30% waste reduction and 70% waste handled. The step of Jastrada development are: (i) estimation of waste generation (0,7 kg/percapita/day); (ii) data collection of waste management; (iii) mass balance of waste; (iv) determination of strategy and target of waste reduction and handling.
	President Regulation No. 83/2018 on Marine Debris Handling In order to handle the marine debris strategies, programmes, and activities that are synergies, measurer and directed to reduce marine debris, especially plastic, in the form of National Action Plan on Marine Debris Handling for 2018-2025 need to be determined. The strategies include goals such as: implementing the plastic excise (tax), reducing waste through circular economy principles, improving the production of degradable plastic up to 25% of the total plastic production in 2025, etc.

INDUSTRIAL WASTE AND EMISSIONS	
2008-2017	**Emission quality standard regulation for industries:** 1. MoEF Regulation No. P.19/MENLHK/SETJEN/KUM.1/2/2017 on Emission Quality Standard for Cement Industry 2. MoE Regulation No. 7/2007 on Emission Quality Standard for steam boiler 3. MoE Regulation No. 17/2008 on Emission Quality Standard for non-moving source for Ceramic Industry 4. MoE Regulation No. 18/2008 on Emission Quality Standard for non-moving source for Carbon Black Industry 5. MoE Regulation No. 21/2008 on Emission Quality Standard for non-moving source for Thermal Power Plant 6. MoE Regulation No. 13/2009 on Emission Quality Standard for non-moving source for Oil and Gas Industry 7. MoE Regulation No. 7/2012 on Emission Quality Standard for non-moving source for Textile (Rayon) Industry 8. MoE Regulation No. 4/2012 on Emission Quality Standard for non-moving source for Mining 9. MoE Regulation No. 12/2012 on Emission Calculation Guideline for Oil and Gas Industry
2014	**GR No. 101/2014 on Hazardous and Toxic (B3) Waste Management** The scope of the regulation: Determination of B3 waste, B3 waste storage, B3 waste collection, transport of B3 waste, utilization of B3 waste, B3 waste management, B3 Waste Stockpiling, Dumping (Disposal) of B3 Waste, exclusion of B3 Waste, transfer of cross-border B3 Waste, Prevention of Environmental Pollution and/or Environmental Damage and Recovery Environmental Function, Emergency Response System in B3 Waste Management, assistances, supervision, financing and administrative sanctions.
	MoEF Regulation No. 3/2014 on Assessment Program on Company Performance of Environmental Management (PROPER) PROPER is the evaluation of compliance and performance beyond compliance of the companyor activities, in the field of pollution control and environmental damage as well as the management of hazardous and toxic waste.
GREEN INDUSTRY	
2014	**Law No 3/2014 on Industrial Affairs** One of the objectives of industrial affairs isto realize an independent, competitive and advanced Industry and the Green Industry. To realize Green industry, government shall conduct a. policy formulation; b. strengthening of institutional capacities; c. Standardization; and d. granting of facilities. Provisions concerning the Green Industry and procedures for the imposition of administrative sanctions and amounts of administrative fines will be regulated in a Government Regulation.
2015	**GR No. 14/2015 on Master Plan of National Industry Development 2015-2035 (RIPIN)** The objectives of implementation of industry in Indonesia are to: 1. actualize national industry as a pillar and driver of the national economy 2. actualize the depth and strength of industrial structures; 3. actualize an independent, competitive and advanced industry, and a Green Industry; 4. actualize business certainty, fair competition, and prevent industrial monopoly which is detrimental to community; 5. open business opportunities and expand employment opportunities; 6. actualize equal distribution of industrial development to all regions of Indonesia in order to strengthen national security; 7. improve community prosperity and welfare in an equitable manner
	MoI Regulation No. 51/M-IND/PER/6/2015 on the Guideline of Green Industry Standard Green Industry is industry in which its production process mainstreams the efficient and effectiveness of sustainable resources utilization, and is able to harmonize industry development with environmental function, sustainability, and able to provide benefits to the community. This regulation provides the required steps to follow green industry standard.
2018	**MoI Regulation No. 39/2018 on Procedure for Green Industry Certification** Industrial companies which have implemented Green Industry can be given a Green Industry Certificate, issued by 'the Green Industry Certification Body (LSIH) stipulated by the Minister. The step of certification: companies request to the LSIH à auditing and verification process by LSIH à certificate issuance or rejection.

3.2.4 Agriculture Policies

The table below provides an overview of relevant policies and regulations in the agricultural sector.

Table 8. Agriculture Policies and Regulations Relevant to LCDI

	AGRICULTURAL LAND PRODUCTIVITY
1992	**Law No. 2/1992 on Crop Cultivation System** Crop cultivation system is the development and utilization system of bio natural resources through human efforts by investment, technology, and other resources to produce goods to fulfil human needs. This regulation aims to: (i) diversification; (ii) improve the farmers income and welfare; and (iii) encourage the expansion and equity of business opportunities and employment opportunities.
2007	**MoA Regulation No. 273/Kpts/OT.160/4/2007 on the Procedure of Institutional Assistances for Farmers** Institutional assistances for farmers are directed at the application of agribusiness system, to increase the participation of farmers and rural community, by developing cooperation between farmers and other related parties to develop their business. In addition, it is also expected that the system can explore the potential andeffective problem solving, and it is expected to be able to provideaccess the information, market condition, technology, investment, and other resources.
2009	**Law No. 41/2009 on Protection to Sustainable Food Agriculture Land (LP2B)** Food agriculture land that is determinedas LP2B consistsof: irrigated land, swamp reclamation land of tidal and non-tidal (*lebak*) and non-irrigated land. The scope of LP2B protection covers: planning and determination, development, research, utilization, guidance, control, monitor, information system, protection and empowerment for farmer, funding and community participation. The regulation complements with **GR No. 12/2012 on Incentives for Protection to LP2B**.
	Presidential Instruction No. 7/2009 on Rice Policy In order to stabilize the national economic condition, improve farmers income, improve national food security, and develop rural economic, the President instructs the related Ministries and governmental institutions to improve the quantity and quality of rice production in sustainable manner.
2011	**GR No. 1/2011 on Determination and Conversion of Sustainable Food Agriculture Land (LP2B)** This regulation aims to: a. actualize and ensure the availability of Sustainable Food Agriculture Land; b. controlling the conversion of Sustainable Food Agriculture Land; c. actualize national food independence, resilience and sovereignty; d. increasing empowerment, income and welfare for farmers; e. provide business certainty for the farmer; f. actualize ecological balance; and g. prevent redundant agricultural infrastructure investment
2016	**MoA Regulation No. 04/Permentan/HK.140/2/2016 on Guidelines for Subsidies for Seed Fiscal Year 2016** The HET price for Seed as follows a. hibrida rice seed IDR 2,500/kg b. hibrida rice seed IDR 4,100/kg c. soy seed IDR 3,100/kg (BR class); d. soy seed IDR 2,500/kg (BR1, BR2, BR3, BR4 class)
2018	**Presidential Instruction No.1 /2018 on acceleration of the water basin and other water reservoir in rural area** In order to provide sufficient water for agriculture activities to improve agriculture production, the related ministries carry out coordination activities to develop the water basin and its supporting infrastructure in rural area.
	MoA Regulation No. 47/Permentan/SR.310/11/2018 on Allocation and the Highest Retail Price (Harga Eceran Tertinggi – HET) for Subsidized Fertilizer on Agricultural Sector for Fiscal Year 2019 Subsidized fertilizer is distributed to farmer which already join Farmer's Community, with maximum area of farm is 2 (two) Ha. The subsidized fertilizers are organic and inorganic (Urea, SP-36, ZA and NPK) fertilizer from the designated producer. The HET price as follows: a. Urea = IDR 1,800/kg b. SP-36 = IDR 2,000/kg c. ZA = IDR 1,400/kg a. NPK = IDR 2,300/kg b. Organic = IDR 500/kg

3.2.5 Institutional and Governance Policies

The table below provides an overview of governance and institutional policies and regulations relevant for LCDI.

Table 9. Institutional and Governance Policies and Regulations Relevant to LCDI

INSTITUTIONAL AND GOVERNANCE POLICIES	
1974	**Law No. 11/1974 on Water Resources** Water resource including natural resources in it, has the social function and utilize for the prosperity of the People. The ownership rights and utilization management of water are the authority of the Government, from national level into regional level. The law No 7/2004 on water resources that promotes integrated water resources management was revoked by The High Court on decision No 85/PUU-XI/2013[3]. Its implication is the function of Law No 11/1974 on Water Resources as public goods is owned by government for the people needs.
1994	**Law No. 6/1994 on the Ratification of the United Nations Framework Convention Climate Change (UNFCC)** The law marks the GoI's full commitment in implementing the Rio UNFCCC which implies that Indonesia is bound to the rights and obligations, stipulated in the Convention. One of the obligations is to communicate actions taken to mitigate climate change that had been submitted its First National Communication on Climate Change Convention on 1995. The document consists of the national inventory of GHG emission and projection, mitigation action plan (which also includes financing, expected funding, and relevant policy), adaptation action plan, and institutional governance as well as action plan on improving the national communication documents.
2009	**Law No 32/2009 on Environmental Protection and Management (EPM)** In general, EPM aims at protecting Indonesia from environmental damage, controlingthe natural resources utilization and realizing the sustainable development by various environmental instrument. The EPM consists of: planning, utilization, control, maintenance, monitoring, and law enforcement. In planning phase, both of national and regional government have to develop the Environmental Protection and Management Plan (EPMP), or knowing as *Rencana Perlindungan dan Pengelolaan Lingkungan (RPPLH)*, based on their authority. The EPM is also supported by other environmental instrument such as SEA (KLHS), spatial plan, environmental quality standard, EIA, PES, environmental audit, etc, which functions as environmental control.
2011	**President Regulation No. 61/2011 on National Action Plan for GHG Emission Reduction (RAN-GRK)** The activities of RAN-GRK covers the sector: Agriculture, Forest and Peatland, Energy and transportation Industry, Waste Management, and Other supporting activities. RAN-GRK contains action plan, activities and target, period, location, indication of emission reduction, and the responsible institution.
2012	**Indonesia's First Mitigation Fiscal Framework (MFF) In support of the National Action Plan to Reduce Greenhouse Gas Emissions (RAN-GRK).** The Government of Indonesia is committed to reducing greenhouse gas emissions by 26% (approximately 767million tCO2e) of business as usual level by 2020. The National Action Plan to Reduce Greenhouse Gas Emissions (RAN GRK) identifies 50 actions that are expected to generate this reduction. In the 2012 state budget, the RAN GRK actions received about IDR 15.9 trillion. Forestry, peatlands, energy and transportation are the focus of this first Mitigation Fiscal Framework (MFF) and cover 93% of the emission reduction targets. MFF is the Indonesian Government guidance for financing RAN GRK. It was prepared by the Centre for Climate Change and Multilateral Financing Policy in the Fiscal Policy Agency of the Ministry of Finance, in close collaboration with BAPPENAS, DNPI, KLH and with key line ministries (Ministry of Forestry, Ministry of Energy and Mineral Resources, Ministry of Transportation, and Ministry of Public Works). MFF is fully funded by the Government through different mechanism and approach.

INSTITUTIONAL AND GOVERNANCE POLICIES

2012

Sources of Finance	IDR tr / yr
Central Government	7.7
Local Government	3.0
Investment Financing (allocated between 2008 and 2012)	4.0
Government tax subsidies for geothermal and bio-fuels	1.2
Total	15.9

Table 9: Sources of Emission Reductions and Indicative Costs

Sources of Emission Reduction	Emission reduction (m tCO2e in 2020)	Indicative costs (IDR tr / year[1])		
		Public	Private	Total
Maintaining RAN GRK expenditure at 2012 levels	116	16	0	16
Additional RAN GRK expenditure in line with GDP	31	4	0	4
Improving cost effectiveness of existing expenditure	78	1-2	0	1-2
Power generation emissions 26% lower, incl. geothermal	104	15-45	15-45	40-70
Policies to limit deforestation to 450,000ha/year	260	1-2	20-30	21-32
Reductions required from new initiatives	121	6	11	17
RAN GRK target for forest, peatland, energy & transport	710	45-75	45-85	100-140
Reductions from agriculture, industry & waste water	57	Not covered in MFF		
Total RAN GRK target	767			

1) Expressed in 2012 prices.

2014

Law No. 23/2014 on Local Government
Governmental affairs consist of absolute, concurrent, and general affairs. The responsibility of governmental absolute affairs is fully conducted by the national government. The responsibility for concurrent affairs is divided between both national and regional government (Provincial and city/regency). The responsibility for general affairs lies in the authority of the President as the head of government. This law regulates the role/responsibility of national, provincial, and city/regency for many aspects including the environmental affairs.
The authority of forest management is given to provincial government via the establishment of Forest Management Unit (FMU) Protection and Production (KPHL / KPHP) institutions. This condition where different authority has the mandate to manage the land-use had caused problem of conflicting concessions to different land-based resource sectors, one of them is due to the inconsistent map.

Law No. 17/2014 on the Ratification of Kyoto Protocol on the Convention of United Nations Framework Convention on Climate Change
The law provides legal basis for Indonesia full commitment on the Kyoto Protocol which was ratified in December 2004 and put into force in March 2005.

National Action Plan on Climate Change Adaptation (RAN-API) - 2014
RAN API provides direction for mainstreaming climate change adaptation in the national development planning process. RAN-API is a document for the period 2013-2025 to help the community in preparing adaptation efforts or adjustments to the effects of climate change that occur. This document had been aligned with the RPJMN 2015 – 2019 and contains input from the government, development partners, community organizations and other practitioners in the field of climate change adaptation. RAN-API also regulate the role sharing of related ministries on the implementation of action plan, coordinating by BAPPENAS and supported by ministries or institution in the field of agriculture, peatland and forestry, energy and transportation and waste management.

	INSTITUTIONAL AND GOVERNANCE POLICIES
2016	**Law No. 16/2016 on Ratification of Paris Agreement to The United Nations Framework Convention on Climate Change.** Basically, this law legalizes the implementation of Paris Agreement as signed by the Indonesian Government on April 22nd 2016 in New York. The Paris Agreement aims to respond to the threats of climate change by keeping the increase of global average temperature to well below 2^{0}C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5^{0}C above pre-industrial levels. Furthermore, the agreement aims to foster climate change resilience, and making finance flows consistent with a pathway towards low GHG emission. To contribute to the target of the Paris Agreement, Indonesia has developed Nationally Determined Contributions (NDCs), with an unconditional carbon emission reduction target of 29%, and an unconditional target of 41% emission reduction with international support, both targets are relative to a BAU by 2030.
	Presidential Regulation No. 9/2016 on Acceleration of the Implementation of One Map Policy on the scale of 1: 50,000 which aims to finish producing One Map consisting of Basic Geospatial Information and Thematic Geospatial Information. The development of the One Map is during the period of 2016-2019.
	Government Regulation No. 46/2016 concerning Strategic Environmental Assessment (SEA) As mandated in the Law No. 32/2009 on EPM, SEA is one of the instruments to prevent pollution and environmental damage. SEA is a series of systematic, thorough, and participatory analysis in order to ensure that the principles of Sustainable Development has become the basis and be integrated in the development of a region and/or policy, plan, and/or program
2017	**Presidential Regulation No. 59/2017 on Achieving the Sustainable Development Goals** As the commitment to contribute the achievement of 17 Global Sustainable Development Goals mentioned in the document: *Transforming Our World: The 2030 Agenda for Sustainable Development* by United Nations General Assembly, Government of Indonesia set the national goals and target in the period of 2017-2019 for the National Mid-term Development Plan 2015-2019 by aligning the 17 global goals. This regulation also gives mandate to the national government to develop Road Map (2017-2030) and Action Plans (5 years) on SDGs. The Provincial Government is also given mandate to develop SDGs Action Plan in the provincial level.
	GR No. 46/2017 on environmental economic instruments This regulation was to support Articles 42 and 43 of Law No. 32 of 2009 on EPM. The regulation provides a set of economic instruments designed to encourage the central government, local governments and other stakeholders to carry out effective and efficient environmental management through development planning, incentives/ disincentives, and public environmental funding.
	Financial Services Authority *(OJK)* Regulation No. 51 /POJK.03/2017 on Sustainable Financing for Financial Service Institution, Listed and Public Company This regulation has two objectives: (1) to encourage the financial services industry sector to implement sustainable finance principles, to allocate more funds to finance businesses or projects that can deliver higher impacts on the economy, environment and society leading to sustainable development; and (2) to encourage financial services industry sectors and listed and/or public companies to report their sustainability performance in standalone sustainability reports. Under this regulation, the companies are mandated to develop the Sustainable Financing Action Plan and Sustainable Report annually. The substance of sustainable report covers the summary of activity of economic, social, and environmental aspects. For environmental aspect, it includes the energy and water use, emission reduction, waste and effluent reduction, and biodiversity conservation. The company which effectively implements the sustainable finance principles will be given incentives from OJK such as: involving the company in human resource competency development programs; Sustainable Finance Award; and other incentives.
	Financial Services Authority (OJK) Regulation No. 60/pojk.04/2017 on the Requirements and Issuance of Green Bond Green bond is a mechanism of a company, such as a financial service organisation, to generate funds from external parties by issuing bonds with certain rate of interests and repayment mechanism. This regulation legalises the issuance of green bonds, where the funds at 70% minimum must be utilised to support sustainable finance programs and activities.

	INSTITUTIONAL AND GOVERNANCE POLICIES
2018	**GR. 24/2018 on Electronically Integrated Business Licensing Services which introduces new business licensing procedures via the OSS System.** This was launched on 9 July 2018. The OSS System is an online business licensing platform intended to accelerate and simplify the process of obtaining business licenses which can be accessed at any time, from anywhere and by any business in Indonesia. The OSS System is currently operated and managed by a dedicated OSS Body under the supervision of the Coordinating Ministry for Economic Affairs until BKPM is ready to take over its management. GR No. 24/2018 mandates that any existing or newly established businesses in Indonesia must obtain a Single Business Number (*Nomor Induk Berusaha - "NIB"*) by registering under the OSS System (https://oss.go.id/oss/). The *NIB* is a mandatory requirement for any business to: (i) apply for new business licenses and/or commercial/ operational licenses; or (ii) extend or amend existing business licenses and/or commercial/operational licenses through the OSS System.
2018	**Presidential Regulation No. 16/2018 on Goods/Services Procurement on Government** one of the concerns of this regulation is to endorse the Green Public Procurement or Sustainable Procurement (*Pengadaan Berkelanjutan*) that aims to reduce the negative impacts for environment on procurement process and implementation of projects.
2018	**MOHA Decree 7/ 2018 on the Development and Implementation of Strategic Environmental Assessment (SEA) for Regional Mid-Term Development Plan (RPJMD)** SEA for RPJMD is a systematic holistic, and participatory analysis to ensure Sustainable Development Goals integrated in to RPJMD (regional dev. Plan). This Decree is referred to GR 46/2016 on SEA and PR No. 59/2017 on SDGs. The steps of SEA implementation are: 1. Establishment of SEA Task Force 2. Analysis of Sustainable Development indicators 3. Formulation the scenario 4. Quality assurance, documentation and validation

3.3 Green Growth Policy Review of OECD

With respect to the attainment of Indonesia's inclusive green growth as well as environmental and climate targets, and especially in accordance to the LCD initiatives, the currently available set of policies and regulations are still facing challenges. This is observed by the findings of OECD in its Green Growth Policy Review for Indonesia that was published in July 2019. [65]

The review employed selected key green growth indicators for assessing Indonesia's green growth performance since 2010 which include (i) resource productivity (ii) the natural asset base and (iii) environmental quality of life, as well as environmental indicators on air, energy, water, biodiversity, land use, waste, resource use, climate and health impacts.

Based on the assessment, the review provides recommendations on key policy developments in fiscal, economic, social and sectoral policies (e.g. energy, transport, mining, agriculture) that either undercut or support environmental objectives and the effectiveness of green growth policies. Including the strategic setting and institutional framework for green growth policy; the influence of competitiveness concerns on environmental policy; the system of taxes and charges, subsidies, and economic instruments; expenditure and investment in water and waste infrastructure and services, renewables, energy efficiency, public transport, promotion of circular economy, and mechanisms for mobilizing private sector investment, eco-innovation, and the social aspects of the transition towards green growth.

A summary of assessment's key findings and recommendations to move towards a green and sustainable economy, which are also relevant for LCDI implementation, are provided in the sections below. The policy gaps and recommendations are grouped by sector as relevant to LCDI, thus certain modification of the report's original grouping categories has been made.

65 OECD 2019, *OECD report - Green Growth Policy Review,* Retrieved from https://www.oecd.org/indonesia/green-growth-policy-review-indonesia.htm

3.3.1 Energy – policy gaps and recommendations

Policy gaps:

- As Indonesia's GDP, population, living standards and energy access increase, the energy demand is also increasing. The energy supply heavily relies on fossil fuels, and GHG emissions from the sector are projected to more than double by 2030. Indonesia's 2014 National Energy Policy envisages nearly tripling its use of coal by 2025, which hinders coherence with climate change objectives. While the government supports the development of renewables, their deployment needs to expand much faster to meet the target of 23% of energy supply by 2025. The government plans to review its energy policy to reconcile the energy security and low-carbon development objectives.
- Energy prices in Indonesia are below the actual costs due to a combination of low energy taxes and energy subsidies. Currently only two low-level energy taxes are in place at sub-national level (a regional motor vehicle fuel tax and a local street lighting tax). Hence 84% of CO2 emissions from energy use are unpriced. The absence of carbon pricing, for example, combined with low energy taxes and fossil-fuel subsidies, discourages energy savings and the shift to cleaner energy sources.
- Although investment in clean energy has been increasing, it still remains small relative to the investment in oil, gas and coal. At USD 1.6 billion in 2017, investment in renewable energy sources also falls short of the estimated USD 15 billion needed per year to meet the 23% renewables target. In 2017, feed-in-tariffs for renewables were replaced with a mechanism capping tariffs in accordance with average regional electricity generation costs. This makes renewables investment attractive in remote areas where generation costs are high, but less so in other parts of the country where population and economic activities are more concentrated, or where electricity is oversupplied.
- The cost of renewables is high in Indonesia compared to the coal that is cheap and abundant (most of which is low-grade). Investment in renewables is associated with high risk, given political uncertainty (i.e. lack of a long-term carbon price signal) and many regulatory adjustments, off-take risks, and burdensome and slow licensing and land acquisition processes. The latter have been eased recently, including through the development of an Online Single Submission system for permitting. Local-content requirements further increase costs, at least in the short run.
- GHG emission reduction in the transport sector is mainly focused on promotion of biodiesel, while promotion of electric vehicles remains largely unaddressed. Lack of a regulatory framework, supporting infrastructure (e.g. charging stations) and supporting policies (e.g. fiscal incentives) are main barriers towards electric vehicles development.

Box 1. Policy Recommendations for the Energy Sector
Source: Readjusted from OECD, 2019

- Revise national energy policy to ensure consistency with climate change policy. Guide the energy transition through an emission reduction goal for the power sector, supported by market-based instruments, to reduce its carbon-intensity (e.g. through carbon pricing). Ensure that any new coal power plants are high-efficiency plants, that existing plants are refurbished and that the most inefficient plants are phased out. Plan for halting investment in unabated coal by 2030.
- Moving towards cost-reflective energy pricing (bringing the implicit price of carbon to positive levels) by continuing to phase out fossil fuel subsidies, while gradually raising the regional fuel tax and expanding energy/carbon taxation to non-road sectors such as industry. Regularly adjust fuel prices to global oil prices and continue to better target electricity and LPG subsidies. In the medium term, replace energy subsidies with cash transfers for poor households. Introduce an explicit carbon price, even if initially very low.
- Align vehicle taxation to environmental performance, for example by linking tax rates to fuel efficiency and the emission of CO2 and local air pollutants to encourage the purchase of more fuel-efficient and low-emission vehicles.
- Develop a comprehensive, transparent and achievable plan to scale up renewables that is backed by high-level commitment and buy-in from all stakeholders. Remove regulatory barriers and streamline processes for granting permits. Develop mechanisms to reduce the risk premium on finance for renewables (e.g. using guarantees). Work towards a level playing field by phasing out subsidies benefiting coal, oil and natural gas production.
- Reform trade barriers such as local content requirements or foreign equity restrictions, which prohibit Indonesia from adopting modern clean energy technology.
- Increase the stringency of energy performance standards (particularly for air conditioning) and enhance enforcement and compliance with energy efficiency regulations.
- Develop support measures for adoption of electric vehicles, particularly electric motorcycles.

3.3.2 Land use – policy gaps and recommendations

Policy gaps:

- The land-use sector has contributed to half of Indonesia's greenhouse gas (GHG) emissions during the past decade and drives environmental alteration. Most GHG emissions from land use sector come from drainage or burning of peatland. Regulations, guidance and methodologies exist for mapping peat, but there is still a need for a detailed and comprehensive peatland map to guide policy decisions.
- Although deforestation rates have decreased in recent years (from 1.2 Mha in 2015 to 0.48 Mha in 2017) deforestation still remains a challenge. Deforestation has been particularly high over the past decade in the islands of Sumatra and Kalimantan, where oil palm and timber planation development has been highest.
- The land is managed according to its legal classification, but conflicting maps hinder a proper land management. Land's legal status also differs from its physical state or ecological value, hampering efforts to direct production towards areas of lower ecological value. For example, land that is legally classed as forest (known as the "forest estate") may lack trees, while forested land exists outside the forest estate. Significant progress has been made in addressing this issue through the One Map initiative. The initiative aims to create a unified map, with 85 thematic layers specifying the status of land in Indonesia. It is also expected to present development objectives in consistent spatial maps.
- Forest moratoriums are key instruments for protecting ecosystems and meeting the government's climate change objectives. By 2018, they covered a 69 Mha of land. However, the environmental effectiveness of moratoriums has been constrained by the lack of penalties for non-compliance, a focus on the issuance of new permits and the fact that moratoriums are temporary by definition.

Box 2. Policy Recommendations for the Land Use Sector
Source: Readjusted from OECD, 2019

- Finalise the remaining elements of the One Map and use it in developing and refining a long-term land use strategy. Provide public access to the mapping information to facilitate transparency and detection of illegal activities. Provide technical support and capacity building to facilitate participatory mapping of customary (adat) lands.
- Continue to improve the measurement and mapping of peatland and forests to more accurately identify areas that are particularly valuable for providing ecosystem services. Enhance public access to information by providing open data where possible.
- Continue efforts to monitor, evaluate and disclose data on deforestation and drivers of land use change.
- Ensure that the system for land allocation and permitting redirects development towards land of lower ecological value. Allow concession holders to leave standing land of high conservation value within their concession area. Simplify the administrative processes governing land swaps between degraded land in the forest estate and standing forest that is permitted for clearance.
- Evaluate the effectiveness and ancillary impact of forest moratoriums. Replace the use of time-limited moratoriums with legislation that provides a predictable legal framework governing sustainable development of primary forests and peatland.
- Expand the terrestrial protected area network and establish mechanisms to encourage effective conservation and sustainable use inside these areas, working with the FMUs and local communities.
- Continue progress towards the target of restoring 2 Mha of degraded peatland. Put in place arrangements to continue restoration activities after the Peatland Restoration Agency deadline of 2020. Raise yields per hectare of agricultural commodities through increased investment in agricultural extension programmes, including increased training for agricultural extension works.
- Review support measures to the forest sector with a view to phasing out subsidies that encourage deforestation and propose alternative options for social considerations.
- Ensure that the Environmental Fund Management Agency starts operating on time and follows international good practice regarding governance, fiduciary responsibilities and environmental and social safeguards. Explore opportunities for this REDD+ financing mechanism to mobilise additional public and private resources.
- Provide additional resources to accelerate registration of social forestry and recognition of customary forests. Encourage peer learning between communities to improve access to the social forestry programme. Disseminate guidance and encourage use of the mobile application for submitting monitoring information for social forestry.
- Accelerate agrarian reform by using the land redistribution programme to recognize community tenure claims, transparently delineate and register state lands and assets, and provide legal access for communities to co-manage state lands and forest resources.
- Reorient agricultural production support away from market price and direct input support towards productivity-enhancing investment (e.g. R&D, education, infrastructure and restoring ecosystem services). Replace fertiliser subsidies with direct cash support for the poorest farmers.

3.3.3 Waste and industrial management - policy gaps and recommendations

Policy gaps:

- On average, 30% of solid waste is burned, buried or dumped at unauthorized sites. Several areas lack public waste service. Collected waste mainly ends up in landfills, nearly half of which are uncontrolled open dumps (although the number is decreasing). The associated contamination of soil, air and water has severe environmental, economic and public health consequences that go beyond boarders. Indonesia is also a major contributor to plastic marine debris, largely due to improperly disposed waste from land.

- Waste banks (where people trade their waste against small amounts of money) has proved to be an innovative and effective tool to improve the municipal waste services. With support from the national and provincial governments, more than 5 200 banks had been created across the country by 2017, handling 2% of waste generated nationally. The banks are helping to raise public awareness and capacity on waste management and generate job opportunities. There is a need to scale up the several successful pilot projects.

- Indonesia has only one private engineered hazardous waste landfill (located in West Java). Most hazardous waste is stored by industries on site, subject to licensing provisions under the 2009 Environmental Protection and Management Law. Verification of storage conditions has been challenging due to a general lack of resources, and it is unclear what happens to the waste once the storage permit expires.

- There is no data are available on the production of chemicals in Indonesia. A comprehensive assessment of existing chemicals and data on pollutant releases are also lacking. Regulations address only a small subset of hazardous substances used in the Indonesian market, and information requirements are limited (e.g. one-time registration and provision of a safety data sheet). There appears to be a need for a stronger regulatory framework that would allow for development of an inventory of chemical substances manufactured or imported in Indonesia.

Box 3. Policy Recommendations for the Waste Sector
Source: Readjusted from OECD, 2019

- Accelerate efforts to expand formal waste collection services to reach 100% of the population. Phase out open dumps and ensure that landfills meet environmental standards. Increase investment in waste disposal capacity, in line with projected future demand
- Formalize waste sorting and recycling, for instance through continued involvement of the informal sector in waste banks and by providing training and social empowerment
- Implement extended producer responsibility programs for the most harmful and abundant products to limit the need for new disposal capacity, and reduce the environmental and health problems associated with improper management of dangerous waste. Consider supporting the construction of hazardous waste treatment infrastructure to cover eastern Indonesia.
- Strengthen the legal framework for the management of industrial chemicals in order to create a national inventory of chemicals and provide authority for systematic assessment and management of chemicals as information evolves. Improve the monitoring of chemicals in the environment.

3.3.4 Institutions and Governance – policy gaps and recommendations

Policy gaps:

- The Environmental impact assessment (EIA) is an important component of Indonesia's environmental regulation and is undertaken primarily at the local and provincial levels. Its use has improved in recent years due to stricter regulatory requirements and better guidance. However, many projects are still approved without appropriate EIA. The documents are often of poor quality and overlook important potential environmental effects, and authorities lack capacity for adequate assessment.

- Strategic environmental assessment (SEA) is increasingly used for spatial plans at the provincial and local levels and for some national and sector policies. SEA is hindered by limited stakeholder and public involvement, limited technical capacity and insufficient monitoring and follow-up. Technical guidelines for SEA implementation are under development.

- The adoption of regulations on environmental economic instruments (in 2017) and an environmental fund (in 2018) poses requirements for operators to pay for eventual remediation of environmental damage. However, there are challenges in implementing

the requirements. District governments lack resources and political will to identify, assess and report on the contaminated sites for which no responsible party can be identified. The national government is only starting to compile an inventory of contaminated sites and has no programme or set of norms guiding remediation.

- Almost 2000 companies participate in the Program for Pollution Control, Evaluation, and Rating (PROPER), a voluntary, colour-coded rating system grading factories' environmental performance against regulatory standards. However, just 6% of large industrial enterprises participate. PROPER has considerable potential as a compliance promotion programme. Disclosing the data underlying a rating (e.g. on emissions or effluents) would enhance transparency.

Box 4. Policy Recommendations for Environmental Governance, Management and Green Growth

Source: Readjusted from OECD, 2019

- Create formal mechanisms of horizontal and vertical co-ordination on environmental matters; expand MEF oversight on provincial and local environmental policy implementation to cover SEA, EIA and permitting.
- Build capacity of provincial and district authorities in SEA, EIA and environmental permitting; ensure consideration of alternatives in environmental assessment; integrate wastewater discharge and hazardous waste storage permits into environmental ones, and ensure their periodic review as well as regular self- reporting of permitted businesses
- Introduce administrative fines for non-criminal offences and provide detailed and uniform guidance to inspectors and the police on the use of enforcement tools; build judicial capacity to handle environmental cases.
- Implement the system of financial guarantees from businesses to constitute funds for remediation of damage to soil, water bodies and ecosystems; compile a nationwide inventory of contaminated sites and design a program for their gradual remediation in collaboration with provincial and district governments; adopt technical standards and guidelines for environmental remediation.
- Improve disclosure of information about industrial environmental performance (e.g. on emissions of air pollutants, wastewater effluent collected through PROPER) and, in the medium term, work towards offsetting up a pollutant release and transfer register.
- Fully follow through with the SEA of the 2020-24 RPJMN. Implement the System of Environmental-Economic Accounts Central Framework to properly value the country's natural capital in economic planning at the national and sub-national levels.
- Make better use of environmentally related taxes and charges with a view to better apply the polluter-pays principle. Consider establishing a dedicated commission to develop options and pathways for a comprehensive green fiscal reform. Items for reform include:
  - Moving towards cost-reflective energy pricing
  - Continue to enhance transparency and law enforcement related to forest concessions as well as mining and fishery permits. Review the structure and rates of royalties, especially in the forestry sector, in order to collect full economic rent on natural resource use
  - Continue efforts to better enforce water abstraction fees.
  - Introduce the planned plastic bag excise tax. Consider introducing taxes on air pollutants and wastewater discharge
  - Continue to enhance transparency and law enforcement related to forest concessions as well as mining and fishery permits. Review the structure and rates of royalties, especially in the forestry sector, in order to collect full economic rent on natural resource use. Continue efforts to better enforce water abstraction fees
- Enhance incentives for investment in waste, water and sanitation by gradually increasing user fees to make service providers more independent, commercially and financially robust and capable of funding capital investment. Poor households should be compensated through existing conditional cash-transfer programmes or other social protection programmes. Support local institutions in improving service quality (a prerequisite for ensuring citizens' willingness to pay) and enhance enforcement capacity. (GOVT and MANAG)
- Continue to build capacity among financial institutions to comply with the sustainable finance regulation and to improve their contributions to financing of climate and green economy-related projects. Explore options on how the regulation could be used to promote compliance with environmental law.

3.9.1 OECD Economic Survey for Indonesia

Earlier in 2018, OECD also conducted the economic survey for Indonesia which provides main messages as follows:

- Shifting the job mix to high-quality, high-productivity positions in the formal sector will boost living standards and share the demographic dividend with future generations. Doing so will require tackling pervasive informality and skills deficiencies.
- Low tax revenues constrain government spending on infrastructure and social services. The key to durably raising revenue is to improve compliance and broaden tax bases.
- Tourism has the potential to diversify the economy, boost regional development and reduce inequalities. Tourist numbers are soaring, but measures are needed to make this rapid growth consistent with long-run environmental sustainability.

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KEY INSTITUTIONS AND ORGANIZATIONS

4 KEY INSTITUTIONS AND ORGANIZATIONS

The following section identifies the stakeholders relevant for LCD implementation based on the context and current policies. The stakeholders include various actors and are described in sub sections. A list of partners and their interventions that have direct support towards LCDI is presented in Annex 2.

4.1 Government

The main government agency responsible for including green economy principles into the national development planning and the implementation of the LCDI is the Ministry of National Development Planning (BAPPENAS), through the Directorate of Environmental Affairs. BAPPENAS is responsible for developing long-term and mid-term national development plants, such as RPJMN 2020-2024.

Other line ministries monitor and evaluate policies within their respective sector and budget for various initiatives. Relevant line ministries and other government agencies are the Ministry of Industry, Coordinating Ministry of Economic Affairs, Coordinating Ministry of Maritime Affairs, Ministry of Environment and Forestry, Ministry of Agriculture, Ministry of Industry, Ministry of Home Affairs, Ministry of Finance (BKF, DJPU), Ministry of Manpower, Ministry of Energy and Mineral Resources (Planning, EBTKE), Ministry of Marine Affairs and Fisheries, Ministry of Public Works, Ministry of Education, BPS-Statistics Indonesia, Financial Services Authority *(Otoritas Jasa Keuangan)*.

4.2 Private Sector

The private sector plays a key role in leveraging necessary funding for implementation of green growth policies. The private sector consists of APINDO (*Asosiasi Pengusaha Indonesia*/Indonesia Businessperson Association), KADIN (*Kamar Dagang Indonesia*/Indonesia Chamber of Commerce), IBCSD (Indonesia Business Council for Sustainable Development), Indonesia global Compact network (IGCN), KSPSI (Trade Union), PT Sarana Multi Infrastruktur (Green Bond issuer), OCBC NISP Bank (the first Indonesian Bank issuing green bonds), BNP Paribas (Partner for Tropical Landscapes Finance Facility), Himbara (Himpunan Bank Negara), The Indonesia Cement Association (ICA), GAPKI (Indonesian Palm Oil Association), PT Pertamina (Persero), PT Inalum (State Owned Holding Company for Mining Sector), METI (Indonesia Renewable Energy Society).

PT Sarana Multi Infrastruktur (PT SMI, a state-owned financing institution) was established with a mandate to support the implementation of blended finance scheme, focusing on two main objectives, which are optimizing the economic and social benefits for the communities and supporting the achievement of Sustainable Development Goals (SDGs) as well as mitigating climate change. PT SMI has obtained sector expansion permit from the OJK, covering the financing for

social infrastructure (hospitals, wet-markets, terminals and others), tourism and rolling stocks. PT SMI is currently actively participating in providing services toward the Government's infrastructure projects as set forth in the RPJMN, National Strategic Project, and National Priority Project. PT SMI also cooperates with the multilateral and donor institutions for funding, as well as with private entities for infrastructure project developments, especially in electricity, transportation, telecommunication, wastewater management, irrigation, road, and bridges.

Supported by International Finance Corporation (IFC), a member of the World Bank Group, Bank OCBC NISP has issued the first green bond amounted to IDR2 trillion (US$134 million) to combat climate change. IFC absorbs the green bonds with maturity of five years. Following the Indonesian regulations, the funds must be allocated into green financing on climate-related projects with minimum allocation at 70% of total funds.

Tropical Landscape Finance Facility (TLFF) consists of a Lending Platform and a Grant Fund. Under the Lending Platform, TLLF provides long-term loans, while the Grant Fund provides technical assistance and co-funds early stage development costs. That offers an opportunity for corporate and private foundations to leverage their funding with private finance. The TLFF Secretariat is hosted by International Centre for Research in Agroforestry (ICRAF), in collaboration with other stakeholders, offering comprehensive support towards the achievement of the stated goals of the Tropical Landscapes Finance Facility.

It is very much possible to engage the financial services industry sector in the LCDI Phase 2 activities. First, as they are mandated to increase their green financing portfolio, they will seek for the opportunities to finance green projects. Second, state-owned banks usually put priorities more on the government agenda. Therefore, engagement of state-owned banks, such as Bank BNI, Bank Mandiri, and Bank BRI, is critical in LCDI Phase 2 implementation, especially in developing business cases and role model for low carbon economy.

4.3 Educational, Research and Training Institutions

Identified Educational, Research and training institutions cover the Indonesia Institute of Deliverology (IDeA), the Overseas Development Institute (ODI), the International Institute for Sustainable Development (IISD), International Institute for Applied System Analysis (IIASA), World Agroforestry (ICRAF), University of Indonesia and Bandung Institute of Technology (ITB),

4.4 Other Development Partners

Relevant development partners include World Resources Institute Indonesia (WRI-Indonesia), the Global Green Growth Institute Indonesia (GGGI), The Nature Conservancy (TNC), Climate Policy Initiative (CPI), the Food and Land Use Coalition (FOLU), and the New Climate Economy (NCE), the World Bank, the UK Climate Change Unit in Indonesia (UKCCU); the Government of Norway, the Government of Denmark, the Asian Development Bank, the German Federal Ministry for Economic Cooperation and Development (BMZ), GIZ, Partnership to Strengthen Transparency for co-Innovation (PaSTI) – an initiative of the Ministry of the Environment Japan (MOEJ), OECD.

In addition, a variety of NGOs and CSOs play an important role in addressing environmental issues in Indonesia and have potential to provide support in green economy inclusion on local level, such as Conservation International, WWF, Friends of the Earth Indonesia, CIFOR etc.

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5

PRIORITIES AND POSSIBLE ACTIONS FOR IMPLEMENTING LCDI

5 PRIORITIES AND POSSIBLE ACTIONS FOR IMPLEMENTING LCDI

5.1 Challenges and Opportunities towards LCDI implementation

LCDI phase 1 has successfully introduced the LCDI model into the SEA process for RPJMN 2020-2024, therefore the government of Indonesia intends to ensure the implementation of the framework through LCDI Phase 2.

Notwithstanding the predicted results, development and introduction of the new planning model and paradigm posed challenges during LCDI Phase 1. Remarkably challenges include: (1) availability and reliability of data, (2) level of understanding and acceptance of stakeholders on new approach, and (3) limited numbers and capacity of national system-dynamic modelers. Furthermore, the upcoming challenges after launching of the LCDI/RPJMN 2020-2024 involve ensuring LCDI implementation and replication of the model into the sub-national level.

The Government of Indonesia (GOI) has indicated that the second phase will be focused on translating the policy into programmatic activities. The interventions will be delivered from third quarter of 2019 until 2024 with twofold objectives; the first is to address challenges in LCDI Phase 1 in order to support LCDI model development for next RPJMN, and second, is to support implementation of LCDI development scenarios by involving multi-stakeholders, improving the integrated Monitoring, Evaluation and Reporting system, strengthening communication and replicating the LCD model at sub-national level. The prioritized policies on LCDI phase 2 will include:

1) **Forests and land use,** addressing the fundamental need to preserve primary forests and other forest areas, along with water, fisheries, **blue carbon** (i.e. mangrove, seagrass) and biodiversity, while also enabling the provision of income and employment for the majority of population and sectors that depend on primary resources; Peat Moratorium and Increased Reforestation.
2) Improvement of land productivity, increasing progressively **agricultural productivity, sustainable agricultural practices**, increasing land for agricultural for paddy field to reach food self-sufficiency.
3) **Transition initiatives toward renewable sources of energy** for a reduction in the country's carbon intensity, it is obvious that development of new and renewable energy (NRE) in Indonesia still faces significant challenges namely the complex pricing mechanism, lack of pricing competitiveness given the substantial coal subsidy; lack of research funding, land procurement issues, lack of lending by financial institutions, lack of level playing field given the substantial subsidies to coal, slow permitting process, overlapping spatial planning, limited availability of data and information; Energy intensity reduction by means of reducing waste and improving efficiency of energy system (resource efficiency).
4) **Household and industrial waste management**, domestic (household) waste management targeting 30% waste reduction from baseline and reduction of emissions by 10% in 2025. Industrial waste management targeting 50% emission reduction from waste by 2025, efficiency and industrial management targeted 50% industrial emission reduction by 2025.

5) **Improvement of governance and institutions,** adjustment of institutional design and paradigm shift towards LCD, new good governance to coordinate line ministries, local government, private sector, domestic and international financial institutions, implement effective monitoring and evaluation.

These efforts are seamless in line with the OECD Green Growth Policy Review [66]for Indonesia 2017-2019 that is on-going process. Their priorities are framed into 4 themes namely:

1) developing the business climate and fostering dynamic growth
2) improving social policies and inclusive growth
3) promoting green growth
4) supporting governance.

Recent development from the Government confirms the priority sectors for the implementation of LCDI Phase 2. Those sectors are energy, industry, agriculture, forestry & peat (land-use), waste, blue carbon (mangrove, seagrass). These prioritized sectors were mentioned during the GoI presentation at side event during the UNFCCC COP25 in Madrid, Spain, in December 2019. Below is presentation slide from the GoI during the above event confirming the above LCDI prioritized sectors.

Source: Bappenas' Presentation at side event at Indonesia Pavilion during UNFCCC COP25 December 2019, in Madrid, Spain[67]

With the aforementioned conditions and based on the LCDI framework that is built on the premise of breaking down the silos, the model serves as an overarching framework which requires active participation and engagement from all related stakeholders. These participations will range from State-Actors within National and Sub-National Level, as well as Non-State Actors including the private sector and development partners, and therefore will require a strong collaborative effort including from various development partners.

66 http://www.oecd.org/environment/country-reviews/Green_Growth_Policy_Review_Indonesia.pdf
67 https://drive.google.com/drive/folders/1BIaKAnLSlo4KVKMCbip--PZJpVi8Xwk-

With respect to the objectives, policy priority, and previously attained milestones; BAPPENAS had indicated the following framework in implementing the LCDI forward:

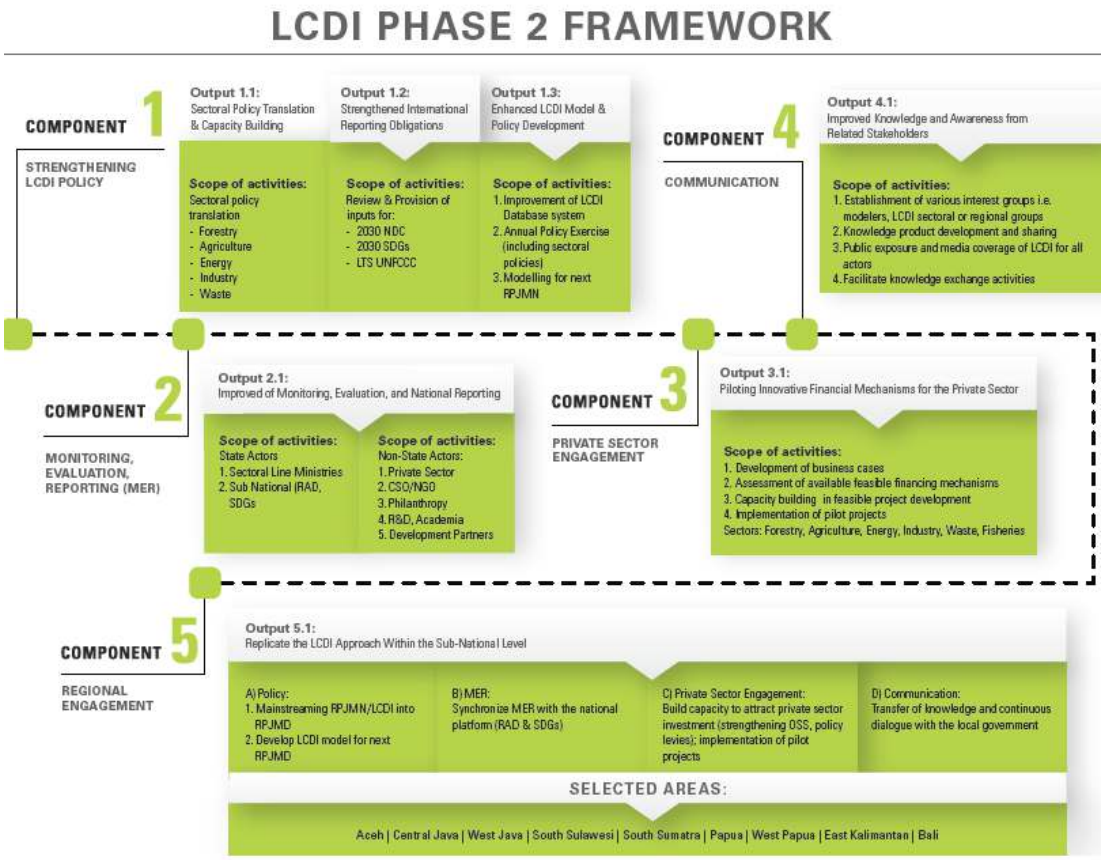

Figure 18.. LCDI Phase 2 Framework
Source: BAPPENAS limited discussion with UNDP (PAGE) & Partners, 2019

Considering current institutional condition, several challenges may curb the LCDI phase 2 such as:

1 ***Coordinating mechanism,*** LCDI policy employs comprehensive approach which overarches through almost all functions within vast level of stakeholders. Currently, there is no clear coordination mechanism that is in place nor indicated within the LCDI policy framework. An effective coordination therefore becomes imperative to be set up which will tap in all related stakeholders within central government, local government, as well as the private sector, not just within regulation context, but most importantly within the operational procedures.

2 ***Engagement & Communication,*** due to the scope of LCDI approach, vision alignment, common understanding, and good communication are critical to assure the success of LCDI implementation. The current silo-based approach promotes disperse perspectives which cause asymmetric information within almost all levels. Whilst the planning process mainly involved BAPPENAS-related function with development partners, the implementation phase will require real action from different stakeholders ranging from Central Government, Local Government, as well as non-state actors. LCDI implementation needs to be supported with a strong evidence-based engagement and communication strategy which can assure that all related stakeholders are correctly identified (including gender equality, indigenous people, people with disabilities) and engaged to support the collaborative actions.

3 ***Institutional setting,*** the sectoral division of function and responsibilities within line ministries as well as power deconcentrating to local government will also pose another challenge since there might persist overlapping key performance indicators between institutions while harmonization mechanism is yet to be established. This condition will obstruct the effort in coordinating, monitoring, and evaluating the implementation of LCDI policy and consequently may decrease the level of LCDI's impact.

4 ***Sectoral Regulation,*** within operational context, there are still overlapping regulations mandated by different institutions as well inadequate sectoral regulation to support LCDI implementation, especially those related with resource mobilization as well as investment mechanism. Overall policies related to the LCDI are listed under Chapter 3. One example is the regulation on sustainable finance (POJK Regulation No.51/2917) that mandates public companies listed under the regulation to report to the Financial Services Authority (OJK) on their sustainability performance, including water consumption. This regulation overlaps with the Government Regulation No.121/2015 on Water Resource Exploitation where the companies are already obligated to report their water consumption to the Government, especially the Governor of the province where the companies operate. Another example is the lack of regulation on incentives in interest rate for renewable energy investment in Indonesia and the unfavorable electricity purchase price by PLN (the state-owned electricity company).

5 ***Abundant source of information,*** other critical challenge comes from unavailability of a reliable database system. There are so many information systems required by different institutions which measure similar process, including those related to climate actions.[68] Along with different sources also lies the issue of different data formats, data compilation methods and data sources. Currently there is no harmonization nor quality assurance on data and information. While the model development and evaluation as well as implementation, monitoring and evaluation will rely heavily on the availability of reliable data, the absence of an integrated database system will also pose challenges to LCDI policy implementation.

6 ***Lack of personnel competencies,*** system dynamics approach is not something new, but it is still rarely used within Indonesian policy and decision-making processes. Therefore, there is not enough personnel who understands the concept as well as the operation of the approach. While the workplan also includes the mainstreaming of LCDI into RPJMN and RPJMD which requires line ministries as well as local governments to apply the approach, it is questionable that those institutions have personnel with required competencies. This condition is also faced by BAPPENAS itself; during the first phase, BAPPENAS was supported heavily by experts provided by development partners to build the IV2045 and investment model.

7 ***Resource Imbalance,*** another condition, which may hinder implementation of the LCDI policy is the resource imbalance within related institutions. Different institutions are likely to have different resource capacities (e.g. financial, human etc.) and therefore their ability to implement the LCDI in their strategic planning and decision-making processes varies. Therefore, a resource mobilization mechanism and strategy are also advisable to be developed to mobilize financial resources from the state budget as well as other public, private and international funds.

This urgency is aligned with LCDI model finding where in terms of financing the low carbon transition, the currently available fund from the GoI, even after support from bilateral and multilateral development organizations, will not be sufficient to meet the necessary resources

68 Based on BAPPENAS LCDI report (2019), the IV2045 economic substructure is based on Indonesia's System of National Accounts (SNA) provided by Statistic National Body.

to bring about the successful transition towards green and low carbon economy.[69] As noted above, the moderate scenario assumes additional investments at an average of US$14.8 billion per year in 2020-2024 (about 1.15% of GDP), and US$40.9 billion per year in 2025-2045 (1.39% of GDP) and even higher for the high case scenario. Therefore, it is critical to ensure that there would be a sufficient flow of private capital, both from domestic and international sources, and to mobilize and direct the necessary public funding at the national and sub-national level, to support the policy implementation.

Regarding this concern, one of the key challenges during the implementation process will be finding the best smart blending finance mechanism specially to fund the investment in sustainable infrastructure that can support the transition. This will require a policy to set up the governance and participation for mainstreaming the low carbon policies in order to set up a feasible and stable policy environment to attract private finance participation.

Currently, Ministry of Finance is developing an investment strategy and formulating a regulation on blended finance mechanisms to provide the legal and policy framework to support finance collaboration between public and private parties in supporting SDGs. The Ministry has established "SDGs Indonesia One" as a blended finance platform to accommodate public funds, funding from the state-owned companies, private equity funds, and philanthropies' contributions. PT Sarana Multi Infrastructure, a state-owned enterprise under the Ministry of Finance, manages the platform.

Furthermore, the Financial Authority Service (OJK) has also issued regulations on sustainable finance and green bonds which can support engagement with banks in financing the LCDI business cases LCDI phase 2 can complement these on-going processes by utilizing the sustainable finance mechanism or the financing mechanisms developed through the Ministry of Finance for its implementation.

69 NCE, BAPPENAS: LCDI Report, 2019

Situational analysis illustrating the challenges to implement LCDI as elaborated above is visualized in Figure 19 below.

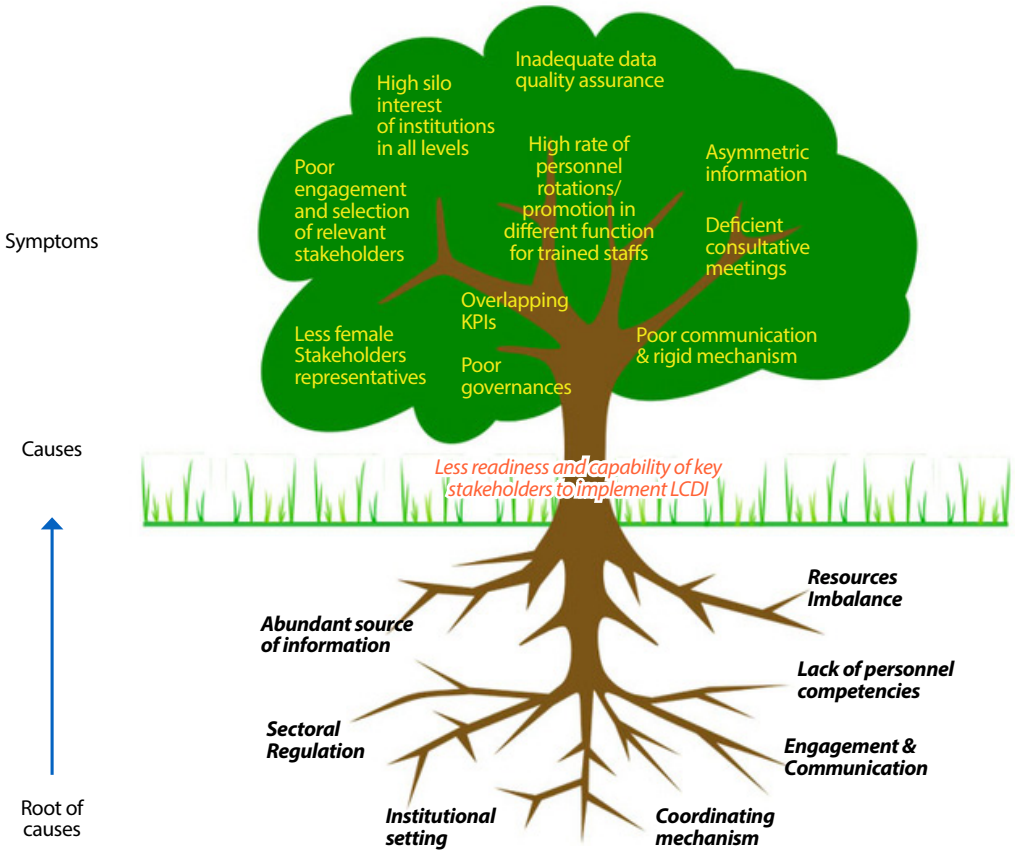

Figure 19. Problem Tree - Situational Analysis
Source: modified from Maria Partidario, 2012

5.2 UN PAGE Initiative for LCDI Phase 2

PAGE's main objective is to enable countries to reframe economic policies around sustainability and put in place enabling policy conditions, reforms, incentives, business models and partnerships. In accordance with global objectives, PAGE Indonesia supports the Government of Indonesia in integrating green economy principles in the country's national development planning.

However, since Indonesia's application to join PAGE was only approved on 25th July 2018 and will be implemented for four years of duration; the scope for PAGE to support LCDI Phase 1 (Jan 2017 – Oct 2019) was limited since it was entering the final stage of RPJMN finalization. In these circumstances, it is advisable for PAGE Indonesia to focus on supporting the implementation process of the LCDI (i.e. LCDI Phase 2, Nov 2019 – Dec 2024).

The PAGE Indonesia outcomes are directly adapted from the PAGE global outcomes and are stated as following:

1) Indonesia has reinforced and integrated IGE goals and targets into SDG-aligned national economic and development planning through multi-stakeholder collaboration
2) Indonesia has implemented evidence-based sectoral and thematic reforms in line with national IGE priorities

3) Indonesia has strengthened individual, institutional and planning capacities for IGE action

Based on the discussion with BAPPENAS during the stocktaking study, several areas that are expected to be supported by PAGE Indonesia include:

1. Supporting policy work at national level by developing database system that is required for LCD modelling for the next RPJMN.
2. Supporting sectoral policy translation of LCDI policy scenarios.
3. Assisting Local Government to mainstream LCD model within their RPJMD and build capacity for its utilization for the next term planning process.
4. Developing Private sector engagement platform and development of incentives for private finance in supporting LCD.
5. Develop knowledge products and facilitate knowledge exchange on LCDI

In addressing root causes indicated in Figure 19 (root part of the problem tree), the strategy to achieve results that is outlined in Figure 20 (Results Map). The strategy includes following approaches: (i) defining overarching interventions, (ii) finding synergies to breakdown of silo mentality, (iii) engaging wider stakeholders in LCDI to achieve holistic and integrated results, especially meeting the three PAGE outcomes.

The approaches to achieve the outcomes, particularly ensuring that Indonesia reframes economic policy around sustainability and puts in place enabling policy conditions, reforms, incentives, business models, and partnerships to catalyze greater action and investment in green technologies and natural, human, and social capital; are summarized as follows:

Defining Overarching Interventions, the five interventions shown in Figure 20 will include basic, advanced and refreshing level of capacity building, knowledge development/sharing and technical support for different target groups and implementation stages that will vary for 3 (three) outcomes indicated above. This is also to make sure that capacity building towards SD call on us to think and act in a comprehensive and interconnected way that goes beyond sectoral silos. Target group will consist not only o government officers, but also private sector as well as service providers that will support continual improvement and implementation of LCDI. This will involve knowledge-sharing initiatives at national level as well as in selected pilot areas. Knowledge sharing will allow creating ownership and motivation among the relevant parties and capacity building will address the skills shortages that constrain LCDI implementation and overall green economy transition.

Finding Synergies to Break Down the Silo Approach, through efficient consultative communication in form of meetings, workshops, sensitization, co-writing on simple and practical publications both within national line ministries and among development partners. Initiative to develop enabling framework for LCDI involves policy development, especially in support of One Data Policy. Having One Data Policy will provide not only confidence and reliability of published information, it will create credibility, transparency, accountability and stakeholder participation. Ultimately, it can contribute to good governance practices especially within public institutions, not only for the planning but more important for viable implementation.

This needs to be mainstreamed to local government's level through pilot application of LCD model, which will provide feedback loop into policy framework development. Complexity and frequent policy changes will contribute to a more difficult policy development, conversely, wider public consultation ahead of proposed changes to regulations would enhance the quality of legislation over time as well as increase transparency in the policy design.

Engaging Wider Stakeholders in LCDI to achieve holistic and integrated results. Participatory engagement of wider stakeholders will assure heterogenic representation of participants with regards to gender, indigenous people and people with disabilities for pilot application in the regions. For national level, various institutions, line ministries, NGO and development partners focusing in LCD, academia/ experts will enhance feedback/input mechanism besides contributing potentially co-sharing resources, clear and committed role sharing will shorten time to deliver results and yet avoiding overlapped output.

Figure 20. Results map identifies links and relevance between impact, outcomes, interventions and other pre-requisite interventions for guarantying a successful implementation of PAGE in the near future. The ellipse shape indicates prerequisite interventions to be available in advance, whilst the square ones are resulted interventions at different stages.

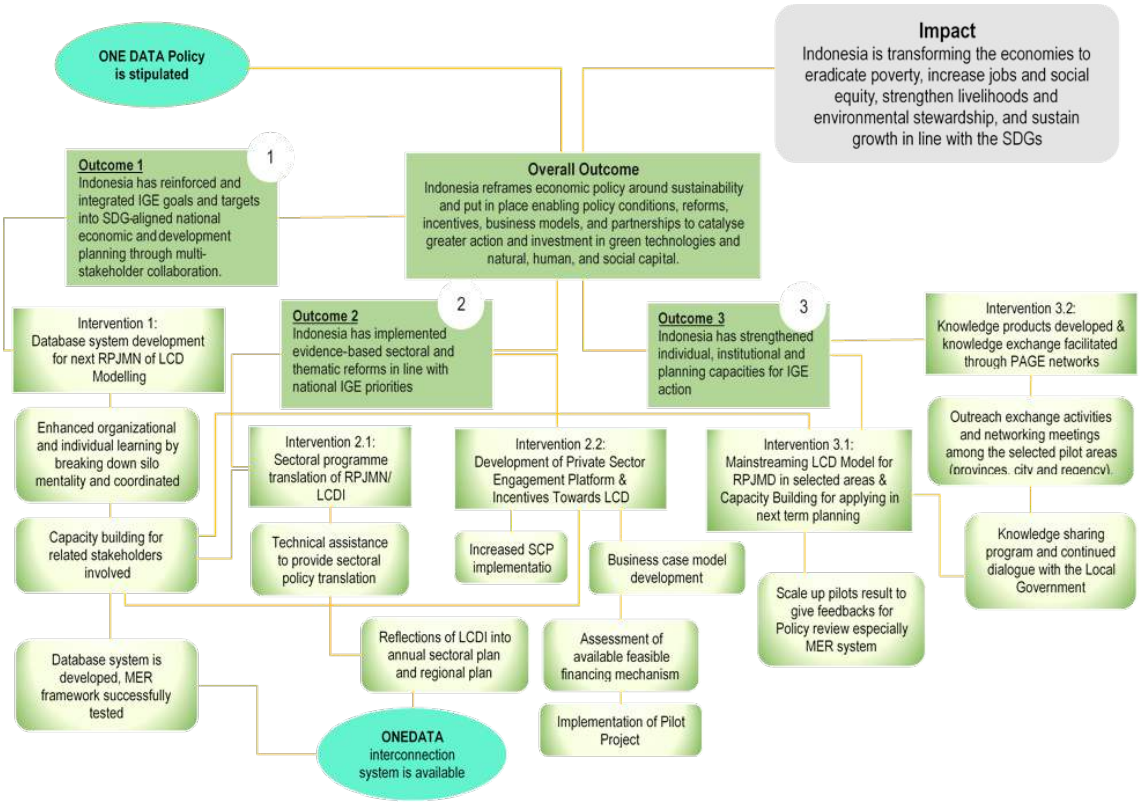

Figure 20. Results Map

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ANNEX

ANNEX 1. SUGGESTED PAGE INTERVENTIONS

2.1 Low Carbon Development Initiative (LCDI)

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
Contributing to achieve Indonesia implementing evidence based sectoral & thematic reform in line with national IGE priorities	To ease achieving this intervention, it will be significantly important having One Data policy stipulated during 2019. The policy scenarios provided by LCDI are derived from the system dynamic (baseline & investment) and spatial dynamic models which capture the behavior & structures that represent the relationship of social, economic, environmental aspects. Critical inputs to produce a robust model is the availability of reliable information and database system. With the current condition where too many data sources are available and no harmonization mechanism in place, it is important to develop database system for LCDI for evaluating & enhancing the model for next RPJM as well as	✔ Database system is enhanced ✔ MER framework utilizing database successfully tested (internally) ✔ Enhanced capacity on synergizing data base for LCD implementations ✔ Enhanced organizational and individual learning by breaking down silo mentality & coordinated instead	1.A) Alignment and harmonization workshop amongst ministries to agree on common database system and its characteristic 1.B) Improvement of LCDI Database system of line ministries and other government bodies through workshop, capacity building and consultation between BAPPENAS, BPS, and line ministries / government bodies 1.C) Annual policy exercise through e.g three-days simulation to review the LCDI framework application, between BAPPENAS and line ministries as well as other government bodies 1.D) Modelling for next RPJMN (2025-2029) and IV 2045 through workshop series & consultation sessions between BAPPENAS and line ministries as well as government bodies 1.E) Consolidated meeting to obtain aggregated SDGs achievement from different line ministries 1.F) Reviewing and providing inputs for 2030 SDGs through workshops and capacity building within BAPPENAS and line ministries 1.G) Reviewing and providing inputs for 2030 NDC through workshop and capacity building with BAPPENAS and MoEF	UN PAGE, BAPPENAS, Possible collaboration with GIZ MRV, PASTI (Ministry of Environment Japan – BAPPENAS), New Climate Economy (NCE), WRI	30 months

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
	monitoring and evaluating the implementation of RPJMN 2020-2024		1.H) Peer review of selected policy scenarios for Indonesia's mid-term national development plan RPJMN 2020-2024 (October-December 2018) 1.I) Development of PAGE Stocktaking report (In the inception phase workplan) 1.J) Desk review for Inception Report on UNITAR's existing trainings and work related to Climate Change in Indonesia (October-December 2018) (In the inception phase workplan) 1.K) PAGE Inception workshop → (In the inception phase workplan) 1.L) Workshop with related Ministries & highlights document (labour-education-planning) to discuss Just Transition, green jobs and green skills needs) (In the inception phase workplan) 1.M) Based on the improved LCDI database system, establish an integrated Monitoring, Evaluation and Reporting, MER platforms (PEP Online- MONEV BAPPENAS) to monitor LCDI implementation involving State and Non-state actors 1.N) Workshop sessions on LCDI Database integration and MER with state actors (line ministries and sub-national) 1.O) Workshop sessions on LCDI Database integration and MER with non-state actors (private sectors, CSO/NGO, philanthropies, R&D actors, academia, development partners) 1.P) Running test and develop training module for different target group and levels)		

PAGE Intervention 2.1: Sectoral Program Translation of RPJMN/LCDI

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
Contributing to achieve Indonesia reinforced and integrated IGE goals and targets into SDG-aligned national economic and development planning through multi-stakeholder collaboration	Development and introduction of new planning model and paradigm posed challenges during LCDI Phase 1. Notably challenges include availability and reliability of data; level of understanding and acceptance of stakeholders on new approach; and limited numbers and capacity of national system-dynamic modelers. The programmatic activities under this output cover the support for sectoral policy translation within LCDI sectors namely land use, energy, fisheries, and water.	✔ technical assistance to provide sectoral policy translation in accordance with suggested LCDI policy scenarios ✔ capacity building for related stakeholders involved especially within BAPPENAS and the Line Ministries. ✔ reflections of LCDI into annual work plan and budgeting of the line ministries (RKA K/L) ✔ enhanced capacities of BAPPENAS and line ministries to develop LCD sound strategic planning.	2.A) Consolidation meeting within BAPPENAS and among line ministries to agree on LCDI adoption for their annual program – aligning to vision & mission of the elected President 2.B) Translation of LCDI into strategic planning and budgeting of ministries and government bodies through series of workshops and consultation sessions 2.C) Conducting learning need assessment within LCDI related sectors which covers the area of green economy, climate change and SDGs as the base for capacity building program within BAPPENAS and Line Ministries for designing LCD annual program of 2020 → (In the inception phase workplan) 2.D) Supporting capacity building within BAPPENAS – on the job training (OTJ) for designing LCD annual program of 2020 which includes the development of training plan, facilitating training for trainers, and modules/guidelines development 2.E) Capacity building for line ministries and government bodies – on the job training (OTJ) for designing LCD annual program of 2020 to 2024 2.F) Providing technical assistance for conducting sectoral and thematic assessments related to LCDI sectors such as Green Industry and Energy assessment, Industrial waste assessment and Management policy & Conduct Green Jobs assessment.	UN PAGE, UNIDO, ILO, UN Environment BAPPENAS, MoI, MoEF, MoF	12 months

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
			2.G) Facilitating consultative meetings with related stakeholders to support the policy formulation and exercise related to LCDI sectors such as on just transition and green jobs (by engaging workers, employers, and related Line Ministries), etc. 2.H) Developing simple guidelines to mainstream LCD sound strategic planning 2.I) Mainstreaming national policies for Industrial areas around LCDI and strengthening implementation through analytical and capacity building work		

PAGE Intervention 2.2: Development of Private Sector Engagement Platform & Incentives Towards LCD

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
Contributing to achieve Indonesia reinforced and integrated IGE goals and targets into SDG-aligned national economic and development planning through multi-stakeholder collaboration	Private sectors with the support of financial institutions are represented by industry sector, the non-oil and gas manufacturing industry, is key driver of Indonesian economic growth. It contributes 18.2% t to the total GDP in 2016. Eight industry sub-sectors (Cement, Fertilizer, Ceramic and Glass, Chemical, Pulp and Paper, Textile, Iron and Steel, and Food and Beverage), are the highest energy consuming industries and are also main contributors to GHG emissions in the industry sector .Therefore, identification of business case from these industries sector will contribute to improve efficiency and ultimately will reduce GHG emission. Additionally, to have agriculture, forestry and other land use sector will provide wide range of business cases.	✔ Increased Sustainable Consumption & Production (SCP) implementation for piloting innovative financial mechanisms for private sector Business case model development ✔ Assessment of available feasible financing mechanism ✔ Capacity building in feasible project development ✔ Implementation of Pilot Project	2.J) Developing business cases from current companies' initiatives in collaboration with sustainability –focused business associations (IGCN, IBCSD, FBI) 2.K) Synergizing with Green Industry application to create market readiness on LCD application (selected industry for business case) 2.L) Assessment of available financing mechanisms suitable for LCDI pilot projects (e.g. green bonds, bank loans, private funding, community development financing – not the financing policies) in collaboration with Financial Services Authority (OJK), Indonesia Stock Exchange (IDX), banks, and other financial services institutions 2.M) Capacity building in feasible LCDI-based project development through trainings, on the job trainings, workshops and consultation sessions with BAPPENAS, related line ministries, government bodies, target companies, banks, insurance companies, investors and sustainability-focused business associations 2.N) Implementation of pilot projects in companies related to LCDI implementation in collaboration with BAPPENAS, related line ministries, government bodies, target companies,	UN PAGE, UNIDO, ILO, UN Environment BAPPENAS, MoI, MoEF, MoF	12 months

73 GHG Profiling report of UNDP – PMR, Executive summary of greenhouse gas emissions profile from Indonesia's industry sector.

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
			banks, insurance companies, investors and sustainability-focused business associations (Business Hub for LCDI Initiatives) 2.O) Benchmarking of other sectors' implemented LCD 2.P) Documenting the results into knowledge sharing platform and during final exposure of the project		

PAGE Intervention 3.1: Mainstreaming LCD Model for RPJMD in selected provinces & Capacity Building for applying in next term planning

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
Contributing to achieve Indonesia strengthened individual, institutional and planning capacities for IGE action	Local governments participated in election last June 2018 have been experiencing applying SEA for their RPJMD referring to MOHA Decree 7/ 2018 which is strongly based on SDGs baseline implementations. Selecting pilot areas to replicate LCD model application in RPJMN 2020-2024 is advance steps for those who have unique characteristics representing Indonesian diversity i.e. natural resources depletion, huge biodiversity, land cover, water & energy supply, economic growth. At the other end, Local Government engagement is imperatives given the regional autonomy to ensure the achievement of NDCs and growth targets.	✔ Local planners in selected areas understand mainstreaming LCD and synchronizing into newly SEA regulation for RPJMD (MOHA Decree 7/ 2018) ✔ SEA task force & planners are strengthened their capacity through on the job training during pilot application Scale up pilots result to give feedbacks for Policy review especially MER system ✔ Knowledge management platform from 8 different pilot application	3.A) Mainstreaming LCDI/RPJMN into RPJMD by providing intensive technical assistance during RPJMD evaluation sessions (the 2nd or 3rd year upon RPJMD implementation) 3.B) Capacity building to universities, experts, and CSOs 3.C) Developing LCDI Model for next RPJMD 2025-2029, through intensive technical assistance and accompanying pilot areas to step by step applying and modifying the LCD Model according to the region's specific characteristics, arranging workshops, simulation, and consultation sessions 3.D) networking meetings/stablishing knowledge sharing platform among the pilot areas, to monitor the progress, identify challenges and obstacles and resolve it. 3.E) Synchronizing subnational MER with national platform, including RAD & SDGs, through workshop and consultation sessions 3.F) Capacity building of local government bodies, to attract private sector investment for LCDI implementation, through workshop activities 3.G) Implementation of LCDI-based pilot projects at local level for non-state actors	UN PAGE, UN Environment BAPPENAS, MOHA, MoEF Possible collaboration with GIZ PAGE (2 pilots in South Sulawesi, one site tbd) (New Climate Economy (NCE), WRI → South Sumatera, Papua and West Papua Bali Central Java West Java	24 months

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
			3.H) Knowledge transfer and continued dialogue with local government, through workshops and sharing sessions with local government bodies 3.I) Documenting pilot application result in the form of knowledge management system, publications for further replication in the future by other partners/local governments. 3.J) Public exposure events to magnetize other provinces applying LCDI approach for their programs conducted per island – Sumatra, Java, Kalimantan, Sulawesi, Bali, Papua & Maluku 3.K) Final exposure workshop to share the results and lessons learned on the pilot application		

PAGE Intervention 3.2: Knowledge products developed and knowledge exchange facilitated

Objective	Rationale	Deliverables	Activities	Responsible Party	Time frame
Contributing to achieve Indonesia improved its knowledge base for advancing IGE	Since the IGE and LCDI required collaborative effort from all level of stakeholders, within national and subnational level, from state and non-state actors, it is imperative to develop necessary knowledge base in order to ensure the sustainability and success of the implementation. The interventions provided within this component are aimed in contributing to the improvement of the knowledge base for advancing the IGE in order to promote the capacity of all related actors, improve the future decision making process by providing the avenue of information and knowledge sharing, as well as raising public awareness in order to harness support, and therefore will optimize the attainment of IGE and LCDI targets.	✔ Knowledge sharing program and continued dialogue with the Local Government ✔ Outreach exchange activities and networking meetings among the selected pilot areas (provinces, city and regency) ✔ Public exposure to magnetize other provinces applying LCDI approach for their program	3.L) Establishment of various interest groups: Modeller and Working Group on targeted areas, in collaboration with sustainability-focused business associations 3.M) Developing and sharing knowledge products (e.g. business cases in printed and digital books, videoclips, website, LCDI Guidebook for Business, LCDI Guidebook for Ministries, LCDI training materials) through seminars and training sessions 3.N) Public exposure and media coverage of LCDI in, e.g. articles in media, infographic, national campaign through digital media, national seminars, exhibition of LCDI pilot projects, sharing the LCDI approach in international forums 3.O) Facilitating exchange activities among the stakeholder groups through LCDI Forum (quarterly meetings) 3.P) [Pilot] Roundtables on Just Transition to Environmental Sustainability conducted in one industrial park: potential sites are Karawang International Industrial City (KIIC) and MM2100 Industrial Park. (In the inception phase workplan) 3.Q) Knowledge Sharing Platform workshop on Just Transition (In the inception phase workplan)	UNDP	Q4 2019 Q1 2020 up to 2024 Q1-2020 up to 2024 Q1-2020

ANNEX 2. PARTNERS WITH DIRECT INTERVENTIONS TOWARDS LCDI

Implementing Partner	LCDI 1	LCDI 2	Description
New Climate Economy (NCE)	• Thematic studies in selected sectors to support the baseline model including: emission reduction, forestry and agriculture, fisheries, energy, peat lands, and climate risk adaptation & resilience in water resources • Support modelling process for an integrated assessment of climate and development policy including: carrying capacity, investment substructure, peer reviewing, appraisal. • Producing policy scenario to feed into RPJMN 2020 – 2024. • Developing LCDI report summarizing outcomes from different studies and providing insights for LCD policies. • Developing communication and engagement strategy.	**Policy Making** • Exercise on Policy enhancement by: • Improve the tools for the LCDI System Dynamics • Developing thematic model for scenario policy analysis	• NCE forms NCE-LCDI partnership to develop the complete model led by BAPPENAS with technical support provided by development partners: WRI-Indonesia, GGGI, The Nature Conservancy (TNC), Climate Policy Initiative (CPI), the Institute for Deliverology (IDEA), the Overseas Development Institute (ODI), the International Institute for Sustainable Development (IISD), the Food and Land Use Coalition (FOLU*), and the New Climate Economy (NCE) • To deliver the support, NCE-LCDI Partnership was financially supported by UKCCU; Government of Norway, the Government of Denmark, the World Bank, the Asian Development Bank, the German Federal Ministry for Economic Cooperation and Development (BMZ), the European Climate Foundation, the Growald Family Fund, the Walton Family Foundation, and the Overlook International Foundation
GIZ	**MRV: (current and to be continued)** • Supporting MRV integration support including non-state actors profiling via UNDP PMR • Improving PEP as an effort to harmonize MRV system via GIZ MRV MMI in collaboration with Kemitraan/Partnership (implementing partner: BAPPENAS)	**GIZ PAGE:** **Green Fiscal** Supporting technical study on green fiscal policy and a potential carbon tax for green-house gas (GHG) emission reductions (key partner: BKF, BKPM, PK APBN)	GIZ PAGE is part of GIZ global initiative with financial support provided by German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). UN Environment is joint partner in delivering the GIZ PAGE support on green fiscal policy in Indonesia

Implementing Partner	LCDI 1	LCDI 2	Description
		Low Carbon Development Providing financial support for UNDP-led project for LCDI (Co-sharing) **Policy Making:** Improvement of LTS to be submitted to UNFCCC (September 2019): supporting harmonization process of data verification to be used as the base for Presidential reporting.	
WRI Indonesia	Supporting NCE-LCDI partnership by providing technical study for: • Land use: via WRI FOLU (food and land use) in Papua/West Papua, East Kalimantan, and South Sumatra. • Conducting background studies for peatland. • Currently: conducting study on legal framework for inter-ministerial committee which responsible in coordinating, monitoring, and evaluating LCDI implementation.	Not yet indicated	• WRI Indonesia is the local lead for NCE-LCDI Partnership which responsible in coordinating the technical modelling works, partnership works relation with line ministries, and thematic studies with other partners to feed into RPJMN.
UKCCU	• Main financial support for NCE-LCDI Partnership for Phase 1 • Expert support and capacity building support for modeler Team (Tasrif Team)	UKCCU can support the four (4) areas of 2nd phase indicated by BAPPENAS; however, several priority areas are already indicated to be supported namely: • Support for policy making effort • Support regional engagement by conducting piloting for Papua, West Papua, and East Kalimantan	• UKCCU fund is delivered as G2G partnership, reputational risk will be considered prior to engaging in implementation process. • UKCCU is extending the LCDI phase to September 2019. Within this grace period, several efforts mainly in capacity building for the technical policy support and preparing the implementation phase (LCDI 2) were conducted.

Implementing Partner	LCDI 1	LCDI 2	Description
World bank WAVES	• Providing technical assistance: by supporting database and accommodating fiscal constraints into the model and providing 2 experts to support the modelling team • Providing supporting data for land cover, ecosystem (including valuation), peat, and water		• WAVES will be concluded by June 2019 where main output from the project will be integrated through BPS' SISNERLING (*Sistem Neraca Lingkungan*) • Identified challenges from WAVES: - Unavailability of structured data - SILO approached from line ministries as well as directorates within BAPPENAS - Promoting engagement and social dialog
GGGI	• Supporting system dynamic modelling by providing technical study in water and communication • Providing review for thematic study in peatland, energy, fisheries, forestry.	Indicate willingness to support but not the area. With regards to piloting LCDI within LG, GGGI indicates their interest in supporting the intervention in the area where they already established program such as in Papua and West Papua (supported by UK CCU and Norway Embassy) and South & Central Kalimantan.	GGGI main financial donor for LCDI project is Norway Government.
UNDP	Sustainable Development Financing (SDF) is part of the Strengthening Governance of Climate Finance (GCCF), a UNDP's regional programme that aims to integrate climate change activities into Indonesia's development planning and fiscal policies while promoting achievement of other SDGs such as gender and poverty reduction. Funded by the Sweden Government, the programme is also supported by the Poverty-Environment Action for the Sustainable Development Goals (PEAS) and the UN Partnership for Action on Green Economy (PAGE). SDF Phase II launched in 28 June 2018, the platform is to improve Indonesia's development planning and budget making processes to a more integrated approach for climate action. By promoting gender equality, transparency, and participation-based principles and standards as well as poverty reduction, it is possible to reduce the impact of climate change		SDF can be then link to support work on private finance blending facility to support to interventions on private sector engagement platform under LCDI Phase 2. UNDP is now supporting the Ministry of Finance in providing technical assistance and capacity building to produce a transparent and accurate impact report on green sukuk, which will show investors that the green sukuk proceeds are indeed being directed to the right investments and delivering on the country's climate change response. For LCDI Phase 2, UNDP is capable of developing a number of tools, that can be utilised as

Implementing Partner	LCDI 1	LCDI 2	Description
	In relation to the implementation of LCDI Phase II, the role of UNDP is also significant as the organisation supports over 140 countries with a climate action portfolio of over US$3 billion. The work of UNDP in Indonesia addresses sustainable development financing, and it has supported the Ministry of Finance on the issuance of the green sukuk as a financing mechanism to engage private sector to funding sustainable development goals. In Phase 2, a number of social impact investment initiatives may be initiated by utilising green sukuk under the LCDI framework at national or sub-national level.		the basis for initiating private sector engagement and business financing cases, under LCDI Framework, namely: 1) Defining and measuring sustainability 2) Assessing eligibility for green finance 3) Development of an impact measurement framework for the green sukuk and other social impact assessment.
OECD	OECD has recently conducted Green Growth Policy Review in Indonesia of its performance since 2017-2019. In January 2019, OECD has also launched The Clean Energy Finance and Investment Mobilisation (CEFIM) Programme aims to strengthen domestic enabling conditions to attract finance and investment in renewable energy and energy efficiency in buildings in emerging economies. The Programme covers five countries in Latin America, South and Southeast Asia and will run over five years as of January 2019. It is supported financially by the government of Denmark.		The OECD Environment Policy Committee (EPOC) brings together high-level Delegates from member countries once or twice a year, to implement the OECD Environment Programme. The Committee meets at Ministerial level every four years. The CEFIM Programme is being undertaken as an activity of the OECD Centre on Green Finance and Investment. The CEFIM Programme complements existing national efforts, as well as bilateral and multilateral cooperation to accelerate the low-carbon transition. It seeks to leverage OECD's convening power and expertise to scale up clean energy investment through three core activities: i) the development of a Clean Energy Finance and Investment Review ii) implementation support activities and iii) regional peer learning. The programme contributes to the implementation of the Sustainable Development Goals, the Paris Agreement and work on clean energy investment and finance by the Clean Energy Ministerial; the Clean Energy Investment Coalition; the P4G initiative; G20 work; and the SE4ALL initiative.

ANNEX 3. INTERLINKAGE BETWEEN PAGE INDONESIA AND LCDI PHASE 2

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	**PAGE Global Output**	**PAGE Global Indicator**	**LCDI phase 2 component**	**Identified PAGE intervention**	**Identified PAGE activities supporting LCDI phase 2** (related to PAGE Indonesia Outcomes)
PAGE Indonesia Outcome 1 Indonesia has reinforced and integrated inclusive green economy (IGE) goals and targets into SDG-aligned national economic and development planning through multi-stakeholder collaboration	**PAGE Global Output 1.1** IGE diagnostics, assessments, and policy analysis undertaken **PAGE Global Output 1.2** Public, private and civil society stakeholders mobilized and engaged in cross-sectoral IGE prioritization	1.1.1 Number of reports providing national IGE diagnostics, assessments and policy analysis and feeding in to national planning processes 1.2.1 Number of cross-sectoral national consultations and dialogues organized to mobilize stakeholders, share results of policy analysis and consult priorities 1.2.2 Number of countries with national steering committees overseeing IGE work meeting regularly	**LCDI Component 1** Strengthening LCDI Policy **LCDI Output 1.3** Enhanced LCDI Model & Policy Development **LCDI Output 1.2** Strengthening International Reporting Obligations **LCDI Component 2** Monitoring, Evaluation, and Reporting (MER) **LCDI Output 2.1** Improved Monitoring, Evaluation and National Reporting of LCDI	**PAGE Indonesia intervention 1** Database System Development for Next RPJMN of LCDI Modeling	1.A) Alignment and harmonization workshop amongst ministries to agree on common database system and its characteristic 1.B) Improvement of LCDI Database system of line ministries and other government bodies through workshop, capacity building and consultation between BAPPENAS, BPS, and line ministries / government bodies 1.C) Annual policy exercise through e.g three-days simulation to review the LCDI framework application, between BAPPENAS and line ministries as well as other government bodies 1.D) Modelling for next RPJMN (2025-2029) and IV 2045 through workshop series & consultation sessions between BAPPENAS and line ministries as well as government bodies 1.E) Consolidated meeting to obtain aggregated SDGs achievement from different line ministries 1.F) Review and provide inputs for 2030 SDGs through workshops and capacity building within BAPPENAS and line ministries 1.G) Review and provide inputs for 2030 NDC through workshop and capacity building with BAPPENAS and MoEF

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	**PAGE Global Output**	**PAGE Global Indicator**	**LCDI phase 2 component**	**Identified PAGE intervention**	**Identified PAGE activities supporting LCDI phase 2** (related to PAGE Indonesia Outcomes)
					1.H) Peer review of selected policy scenarios for Indonesia's mid-term national development plan RPJMN 2020-2024 (October-December 2018 2019?) (In the inception phase workplan) 1.I) Development of PAGE Stocktaking report (In the inception phase workplan) 1.J) Desk review for Inception Report on UNITAR's existing trainings and work related to Climate Change in Indonesia (October-December 2019) (In the inception phase workplan) 1.K) PAGE Inception workshop (In the inception phase workplan) 1.L) Workshop with related Ministries & highlights document (labour-education-planning) to discuss Just Transition, green jobs and green skills needs). (In the inception phase workplan) 1.M) Based on the improved LCDI database system, establish an integrated Monitoring, Evaluation and Reporting, MER platforms (PEP Online- MONEV BAPPENAS) to monitor LCDI implementation involving State and Non-state actors 1.N) Workshop sessions on LCDI Database integration and MER with state actors (line ministries and sub-national) 1.O) Workshop sessions on LCDI Database integration and MER with non-state actors (private sectors, CSO/NGO, philanthropies, R&D actors, academia, development partners) 1.P) Running test and develop training module for different target group and levels)

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	**PAGE Global Output**	**PAGE Global Indicator**	**LCDI phase 2 component**	**Identified PAGE intervention**	**Identified PAGE activities supporting LCDI phase 2** (related to PAGE Indonesia Outcomes)
PAGE Indonesia Outcome 2 Indonesia is implementing evidence-based sectoral and thematic reforms in line with national IGE priorities	**PAGE Global Output 2.1** Sectoral diagnostics, assessments, and policy analysis undertaken **PAGE Global Output 2.2** Advisory support integrated into the design and advancement of sectoral and/or thematic policies, strategies, and plans	2.1.1 Number of reports available providing sectoral or thematic IGE diagnostics, assessments, and policy analysis 2.2.1 Number of sectoral or thematic consultations and dialogues organized, informed by results of sectoral policy analysis	**LCDI Component 1** Strengthening LCDI Policy **LCDI Output 1.1** Sectoral Policy Translation and Capacity Building	**PAGE Indonesia intervention 2.1** Sectoral Programme Translation of RPJMN/LCDI	2.A) Consolidation meeting within BAPPENAS and among line ministries to agree on LCDI adoption for their annual program – aligning to vision & mission of the elected President 2.B) Translation of LCDI into strategic planning and budgeting of ministries and government bodies through series of workshops and consultation sessions 2.C) Conducting learning need assessment within LCDI related sectors which covers the area of green economy, climate change and SDGs as the base for capacity building program within BAPPENAS and Line Ministries for designing LCD annual program of 2020 (In the inception phase workplan) 2.D) Supporting capacity building within BAPPENAS – on the job training (OTJ) for designing LCD annual program of 2020 which includes the development of training plan, facilitating training for trainers, and modules/guidelines development 2.E) Capacity building for line ministries and government bodies – on the job training (OTJ) for designing LCD annual program of 2020 to 2024 2.F) Technical assistance in conducting sectoral and thematic assessments related to LCDI sectors such as Green Industry and Energy assessment, Industrial waste assessment and Management policy & Conduct Green Jobs assessment. (Partially in the inception phase workplan Green Industry Assessment)

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	**PAGE Global Output**	**PAGE Global Indicator**	**LCDI phase 2 component**	**Identified PAGE intervention**	**Identified PAGE activities supporting LCDI phase 2** (related to PAGE Indonesia Outcomes)
					2.G) Facilitating consultative meetings with related stakeholders to support the policy formulation and exercise related to LCDI sectors such as on just transition and green jobs (by engaging workers, employers, and related Line Ministries), etc 2.H) Develop simple guidelines to mainstream LCD sound strategic planning 2.I) Mainstreaming national policies for Industrial areas around LCDI and strengthening implementation through analytical and capacity building work
	PAGE Global Output 2.3 IGE financing partners mobilized and engaged including UNCT, donors, IFIs, development banks and private sector	2.3.1 Number of partners formally agreeing to co-financing, complementary follow-up programming, pledges, PPPs, etc.	**LCDI Component 3** Private Sector Engagement **LCDI Output 3.1** Piloting innovative financial mechanisms for private sector	**PAGE intervention 2.2** Development of Private Sector Engagement Platform & Incentives towards LCDI	2.J) Develop business cases from current companies' initiatives in collaboration with sustainability –focused business associations (IGCN, IBCSD, FBI) 2.K) Synergizing with Green Industry application to create market readiness on LCD application (selected industry for business case) 2.L) Assessment of available financing mechanisms suitable for LCDI pilot projects (e.g. green bonds, bank loans, private funding, community development financing – not the financing policies) in collaboration with Financial Services Authority (OJK), Indonesia Stock Exchange (IDX), banks, and other financial services institutions 2.M) Capacity building in feasible LCDI-based project development through trainings, on the job trainings, workshops and consultation sessions with BAPPENAS, related line ministries, government

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	PAGE Global Output	PAGE Global Indicator	LCDI phase 2 component	Identified PAGE intervention	Identified PAGE activities supporting LCDI phase 2 (related to PAGE Indonesia Outcomes)
					bodies, target companies, banks, insurance companies, investors and sustainability-focused business associations 2.N) Implementation of pilot projects in companies related to LCDI implementation in collaboration with BAPPENAS, related line ministries, government bodies, target companies, banks, insurance companies, investors and sustainability-focused business associations (Business Hub for LCDI Initiatives) 2.O) Benchmarking of other sectors' implemented LCD 2.P) Document the results into knowledge sharing platform and during final exposure of the project
PAGE Indonesia Outcome 3 Indonesia has strengthened individual, institutional and planning capacities for IGE action	**PAGE Global Output 3.1** Capacity development support delivered to national institutions **PAGE Global Output 3.2** Nationally tailored training programs developed and delivered **PAGE Global Output 3.3** Global and regional leadership and training programs and	3.1.1 Number of national institutions having strengthened their capacity to deliver IGE policy analysis or training or to lead policy and stakeholder consultation processes 3.2.1 Number of people trained through national level training programmes 3.2.2 Percentage of participants who report having increased their	**LCDI Component 5** Regional Engagement **LCDI Output 5.1.** Replicate the LCDI Approach for selected Sub national Level	**PAGE Intervention 3.1** Mainstreaming LCD model for RPJMD in selected areas & capacity building for applying in next term planning	3.A) Mainstreaming LCDI/RPJMN into RPJMD by providing intensive technical assistance during RPJMD evaluation sessions (the 2nd or 3rd year upon RPJMD implementation) 3.B) Capacity building to universities, experts, and CSOs 3.C) Develop LCDI Model for next RPJMD 2025-2029, through intensive technical assistance and accompanying pilot areas to step by step applying and modifying the LCD Model according to the region's specific characteristics, arranging workshops, simulation, and consultation sessions 3.D) Carry out networking meetings/establish knowledge sharing platform among the pilot areas, to monitor the progress,

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	**PAGE Global Output**	**PAGE Global Indicator**	**LCDI phase 2 component**	**Identified PAGE intervention**	**Identified PAGE activities supporting LCDI phase 2** (related to PAGE Indonesia Outcomes)
	packages developed and delivered for individuals and institutions	capacity in IGE related issues through national trainings 3.3.1 Number of people that have been trained on IGE in globally or regionally offered on-line training and on-campus training programmes 3.3.2 Percentage of participants who report having increased their capacity in IGE related issues in global and regional training programmes 3.3.3 Number of IGE training programmes and specific training modules being offered to countries (at global and national level)			identify challenges and obstacles and resolve it. 3.E) Synchronise subnational MER with national platform, including RAD & SDGs, through workshop and consultation sessions 3.F) Capacity building of local government bodies, to attract private sector investment for LCDI implementation, through workshop activities 3.G) Implementation of LCDI-based pilot projects at local level for non-state actors 3.H) Knowledge transfer and continued dialogue with local government, through workshops and sharing sessions with local government bodies 3.I) Document pilot application result in the form of knowledge management system, publications for further replication in the future by other partners/local governments. 3.J) Public exposure events to magnetize other provinces applying LCDI approach for their programs conducted per island – Sumatra, Java, Kalimantan, Sulawesi, Bali, Papua & Maluku 3.K) Final exposure workshop to share the results and lessons learned on the pilot application
			LCDI Component 4 Communication	**PAGE Intervention 3.2** Knowledge products developed, and knowledge shared through PAGE networks	3.L) Establishment of various interest groups: Modeller and Working Group on targeted areas, in collaboration with sustainability-focused business associations 3.M) Develop and share knowledge products (e.g. business cases in printed and digital

PAGE Indonesia Outcome (Adapted from PAGE Global outcomes)	**PAGE Global Output**	**PAGE Global Indicator**	**LCDI phase 2 component**	**Identified PAGE intervention**	**Identified PAGE activities supporting LCDI phase 2** (related to PAGE Indonesia Outcomes)
			LCDI Output 4.1. Improved Knowledge and Awareness from Related Stakeholders		books, videoclips, website, LCDI Guidebook for Business, LCDI Guidebook for Ministries, LCDI training materials) through seminars and training sessions 3.N) Public exposure and media coverage of LCDI in, e.g. articles in media, infographic, national campaign through digital media, national seminars, exhibition of LCDI pilot projects, sharing the LCDI approach in international forums 3.O) Facilitate exchange activities among the stakeholder groups through LCDI Forum (quarterly meetings) 3.P) [Pilot] Roundtables on Just Transition to Environmental Sustainability conducted in one industrial park: potential sites are Karawang International Industrial City (KIIC) and MM2100 Industrial Park. (In the inception phase workplan) 3.Q) Knowledge Sharing Platform workshop on Just Transition (In the inception phase workplan)