Date: September 5, 2023

Environmental and Social Considerations in Detailed Planning Survey
(Technical Cooperation for Development Planning)

1. Full title of the Project

Master Plan for Energy Transition Management Project

2. Type of the study (e.g., Master Plan, Feasibility Study, Detailed Design, etc.)

Master Plan

3. Categorization and its reason

The Project is categorized as B under the 'JICA Guidelines for Environmental and Social Considerations (January 2022)' (hereinafter referred to as "the Guideline"), because the project is not likely to have significant adverse impact on the environment under the Guideline in terms of its sectors, characteristics and areas.

4. Agency or institution responsible for the implementation of the project

Indonesia National Electricity Company (PT PLN)

5. Outline of the Project (objectives, justification, location, proposed activities, and scope of the study)

5-1 Overall Goal

To realize stable, reliable, affordable and sustainable power supply with achievement of the de-carbonization by 2060 in Indonesia.

5-2 Project Purpose

To formulate the master plan especially for decarbonzation of thermal power plants to achieve stable, reliable, affordable and sustainable power supply toward 2060.

5-3 Outputs

- To review the carbon neutrality road map toward 2060
- To formulate demand forecast and power system planning
- To formulate a master plan for decarbonzation of thermal power plants along with the road map
- To formulate the action plans to realize the master plan
- To build up PLN's knowledge and practical capability of de-carbonization technology and application to the thermal power plants

Note: The targeted thermal power plants are basically focused on thermal power plants related to PLN or PLN owned subsidiary.

5-4 Activities

1.1 Review and analysis of energy policy / existing plans (power development plan, new power development plan, power grid plan, etc.)
1.2 Review and analysis of Power demand forecast
1.3 Review and analysis of renewable energy potential
1.4 Review and analysis of power supply and demand balance scenario
1.5 Review and analysis of power supply configuration
1.6 Organizing issues to achieve the power supply configuration

2.1 Formulate more practical demand forecast considering followings:
- Increase of Roof top generation
- Increase of Energy efficiency
- Increase of EV introduction

2.2 Power system analysis and planning
2.3 Optimal power system operation with high ratio of VRE (Variable Renewable Energy)

3.1 Analysis of the existing power plants and grid systems
3.2 Examination of optimal power supply placement based on system analysis
3.3 Implementation of Strategic Environmental Assessment
3.4 Formulation of low (de) carbonization plan for power generation mix
3.5 Zero emission thermal power development plan (assuming future utilization of CCS[1], hydrogen and ammonia)

[1] Carbon Capture and Storage (CCS)

3.6 Plan of fuel procurement
3.7 Formation of long-term power grid development
3.8 Organizing issues and policy recommendations to realize the master plan

4.1 Setting goals (Overall (Upper) goals, T/C Project goals, Results)
4.2 Selection of implementation point / period for T/C Project
4.3 Formulation of the program (activity / output / input) for T/C Project

5.1 Local workshop
5.2 Implementation of skill training
5.3 Site visit (training in Japan)

6. Description of the project

6-1 Project site

Whole area of Indonesia

6-2 Map of the country

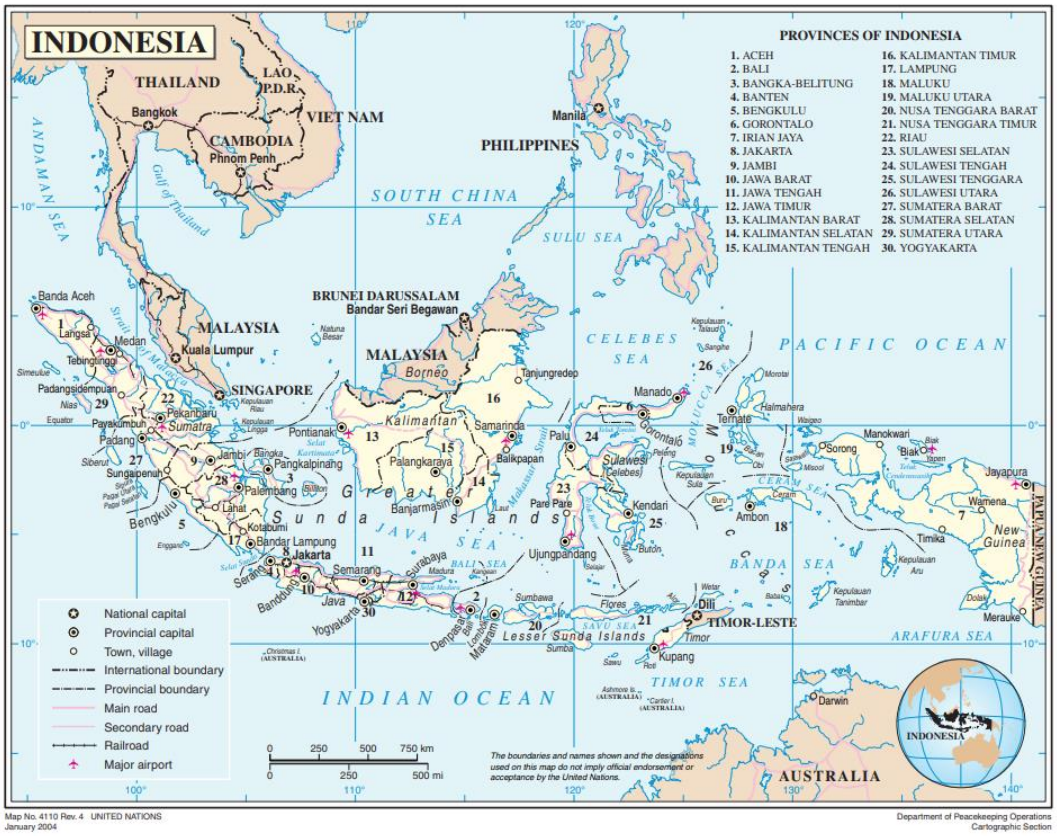

Fig 1: Map of Indonesia

Source: United Nations Cartographic Section (2004)

6-3 Environmental Condition

6-3-1 Topography

According to Indonesia's National Coordinating Agency for Survey and Mapping, the total number of islands in the archipelago is 13,466, of which 922 are permanently inhabited (Indonesia is the world's largest country comprised solely of islands); the country straddles the equator and occupies a strategic location astride or along major sea lanes from the Indian Ocean to the Pacific Ocean.

Indonesia is one of the countries along the Ring of Fire, a belt of active volcanoes and earthquake epicenters bordering the Pacific Ocean; up to 90% of the world's earthquakes and some 75% of the world's volcanoes occur within the Ring of Fire; 80% of tsunamis,

caused by volcanic or seismic events, occur within the "Pacific Ring of Fire". Despite having the fourth largest population in the world, Indonesia is the most heavily forested region on earth after the Amazon

6-3-2 Climate

Indonesia's climate is tropical, with the highest rainfall occurring in its low-lying areas. The mountainous regions experience cooler temperatures. The wet season occurs between November and April, leaving May through October typically dry. There is little season-by-season variation in temperature and relatively little variation by elevation (Averaging 23°C in the mountainous areas and 28°C in the coastal areas). There is more variability in precipitation by elevation: the average annual rainfall in the lowlands around 1,800 millimeters (mm) to 3,200 mm compared with the mountainous regions, where it can reach up to 6,000 mm.21 The climate of Indonesia is primarily influenced by the El Niño Southern Oscillation (ENSO), where drier conditions are experienced during El Niño events and wetter conditions during La Nina events. Average monthly temperatures in Indonesia remain constant throughout the year, at approximately 25°C–26°C. In contrast, there is considerable variation in average monthly rainfall. The lowest rainfall is found during the dry season, June to September, when average monthly rainfall in June and July is around 160 mm-180 mm. The months with the highest rainfall, associated with monsoons, occur between October to May. On average there is 300 mm of rainfall during the May and November months, approximately twice that of the driest months.

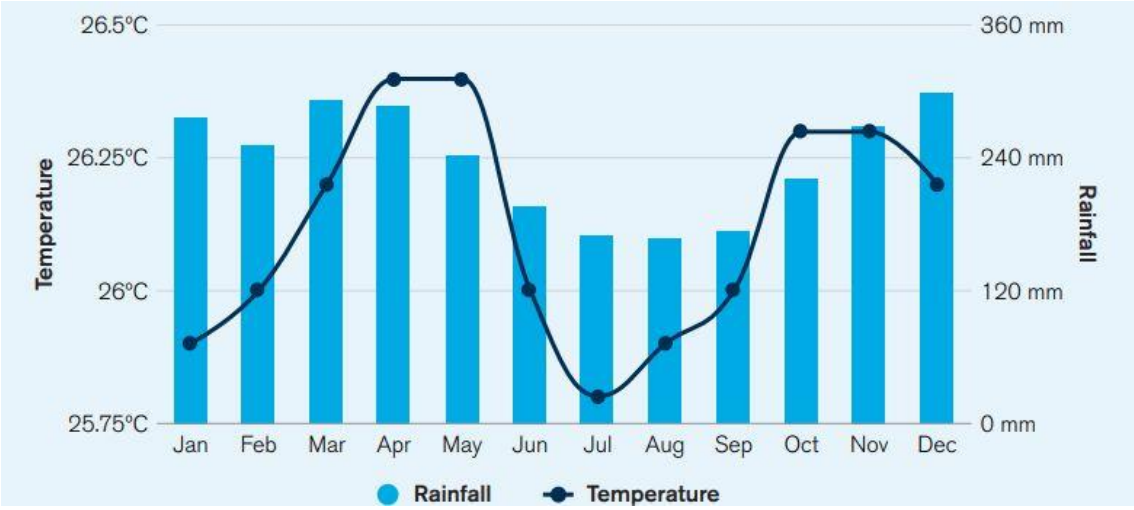

Fig 2: Average monthly temperature and rainfall in Indonesia

(Source: Climate Change Knowledge Portal, World Bank)[2]

[2] Indonesia - Climatology | Climate Change Knowledge Portal (worldbank.org)

6-3-3 Land Use

Indonesia has total land area of 1,904,569 square kilometers. Out of this land area, agricultural land and forest cover 31.2% and 51.7% respectively.

Table 1: Land use of Indonesia as of 2018[3].

Agricultural land	31.2%	Arable Land	13%
		Permanent crops	12.1%
		Permanent pasture	6.1%
Forest	51.7%		
Other	17.1%		

6-3-4 Biodiversity

There are 7 major biogeographic regions in Indonesia, centered on the major islands and their surrounding seas. Conservation International considers Indonesia to be one of the 17 "megadiverse" countries, with 2 of the world's 25 "hotspots", 18 World Wildlife Fund's "Global 200" ecoregions and 24 of Bird Life International's "Endemic Bird Areas". It also possesses 10% of the world's flowering species (estimated 25,000 flowering plants, 55% endemic) and ranks as one of the world's centers for agrobiodiversity of plant cultivars and domesticated livestock. For fauna diversity, about 12% of the world's mammals (515 species) occur in Indonesia, ranking it second, after Brazil, at the global level. About 16% of the world's reptiles (781 species) and 35 species of primate place Indonesia fourth in the world. Further, 17% of the total species of birds (1,592 species) and 270 species of amphibian's place Indonesia in the fifth and sixth ranks, respectively, in the world.[4]

6-3-5 Protected Areas

Protected areas in Indonesia are classified in four categories[5];

1. Areas that provide protection for their subordinate areas.
2. Local Protected Areas.
3. Nature Reserve and Cultural Heritage Areas
4. Areas prone to natural disasters

As of these, "Nature Reserve and Cultural Heritage Areas" consists of;

[3] The World Factbook - The World Factbook (cia.gov)

[4] Website: Convention on Biological Diversity; https://www.cbd.int/countries/profile/?country=id

[5] decree of the president No. 32, 1990

-Nature Reserve Area.

-Marine Nature Reserve Areas and other waters.

-Mangrove forested coastal areas.

-National Parks, Grand Forest Parks and Nature Tourism Parks.

-Cultural and Scientific Heritage Area

There are over 500 protected areas in Indonesia, of which 54 National Park are covering 16.4 million ha, and another 527 nature and game reserves cover further 28.3 million ha.[6] The total protected land area represents over 15% of Indonesia's landmass.[7] Marine Protected Areas comprise over 23.4 million ha representing ca. 7.2 % of territorial waters as of 2020.[8]

Table 2-1: List of National Parks (Java, as of 2016)

Name	Year	Total Area (km²)	Marine area (km²)	International status
Alas Purwo	1992	434		
Baluran	1980	250		
Bromo Tengger Sem	1983	503		World Network of Biosphere Reserves
Gunung Ciremai	2004	155		
Gunung Gede Pangr	1980	150		World Network of Biosphere Reserves
Gunung Halimun Sa	1992	400		
Gunung Merapi	2004	64		
Gunung Merbabu	2004	57		
Karimunjawa	1986	1,116	most	
Kepulauan Seribu	1982	1,080	most	
Meru Betiri	1982	580		
Ujung Kulon	1992	1,206	443 km²	World Heritage Site

[6] Convention on Biological Diversity: "Indonesia Country Profile", retrieved 24 December 2013

[7] World Database on Protected Areas: Summary of protection by Country and Territory on 31 January 2008, retrieved 2009-09-30 Archived 8 January 2009 at the Wayback

[8] Indonesia Marine Protected Area Outlook and Progress, Directorate General Marine Spatial Planning, Ministry Marine Affairs and Fisheries, 2020,

Table 2-2: List of National Parks (Kalimantan, as of 2016)

Name	Year	Total Area (km²)	Marine area (km²)	International status
Betung Kerihun	1995	8,000		Proposed World Heritage Site[7]
Bukit Baka Bukit Ray	1992	1,811		
Danau Sentarum	1999	1,320		Ramsar site
Gunung Palung	1990	900		
Kayan Mentarang	1996	13,605		
Kutai	1982	1986		
Sabangau	2004	5687		
Tanjung Puting	1982	4150		World Network of Biosphere Reserves

Table 2-3: List of National Parks (Lesser Sunda Islands, as of 2016)

Name	Year	Total Area (km²)	Marine area (km²)	International status
Bali Barat	1995	190		
Gunung Rinjani	1990	413		
Kelimutu	1992	50		
Komodo	1980	1817	0.66	World Heritage Site; World Network of Biosphere Reserves
Laiwangi Wanggame	1998	470		
Manupeu Tanah Da	1998	880		
Mount Tambora[9]	2015	716		

Table 2-4: List of National Parks (Maluku and Papua, as of 2016)

Name	Year	Total Area (km²)	Marine area (km²)	International status
Lorentz	1997	25,050		World Heritage Site[10]
Manusela	1982	1,890		
Teluk Cenderawasih	2002	14,535	0.9	
Wasur	1990	4,138		Ramsar site

Table 2-5: List of National Parks (Sulawesi, as of 2016)

Name	Year	Total Area (km²)	Marine area (km²)	International status
Bantimurung - Bulus	2004	480		
Bogani Nani Wartab	1991	2,871		
Bunaken	1991	890	97%	Proposed World Heritage Site
Gandang Dewata	2016	793		
Kepulauan Togean	2004	3,620	700	
Lore Lindu	1982	2,290		World Network of Biosphere Reserves
Rawa Aopa Watumo	1989	1,052		Ramsar site
Taka Bone Rate	2001	5,308	most	World Network of Biosphere Reserves Proposed World Heritage Site
Wakatobi	2002	13,900	most	World Network of Biosphere Reserves Proposed World Heritage Site

Table 2-6: List of National Parks (Sumatra, as of 2016)

Name	Year	Total Area (km²)	Marine area (km²)	International status
Batang Gadis	2004	1,080		
Berbak	1992	1,628		Ramsar site
Bukit Barisan Selata	1982	3,650		World Heritage Site unit
Bukit Duabelas	2000	605		
Bukit Tigapuluh	1995	1,277		
Gunung Leuser	1980	7,927		World Heritage Site unit
World Network of Biosphere Reserves				
Kerinci Seblat	1999	13,750		World Heritage Site unit
Sembilang	2001	2,051		Ramsar site
Siberut	1992	1,905		World Network of Biosphere Reserves
Tesso Nilo	2004	1,000		
Way Kambas	1989	1,300		
Zamrud	2016	314		
Mount Maras	2016	168		

7 Social Condition

7-1 Demographics

Indonesia has the world's fourth-largest population. It is predominantly Muslim and has the largest Muslim population of any country in the world. The population is projected to increase to as much as 320 million by 2045. Through government-supported family

planning program, total fertility rate (TFR) – the average number of births per woman – decreased from 5.6 in the mid-1960s to 2.7 in the mid-1990s. The success of the program was also due to the social acceptance of family planning, which received backing from influential Muslim leaders and organizations. The fertility decline slowed in the late 1990's when responsibility for family planning programs shifted to the district level, where the programs were not prioritized. Since 2012 the national government revitalized the national family planning program, and Indonesia's TFR has slowly decreased to 2.3 in 2020. The government may reach its goal of achieving replacement level fertility – 2.1 children per woman – but the large number of women of childbearing age ensures significant population growth for many years. [9]

7-2 Poverty

Indonesia has made impressive gains in reducing poverty, with previously lagging regions catching up, and the Government's goal to eliminate extreme poverty by 2024 practically met.[10]

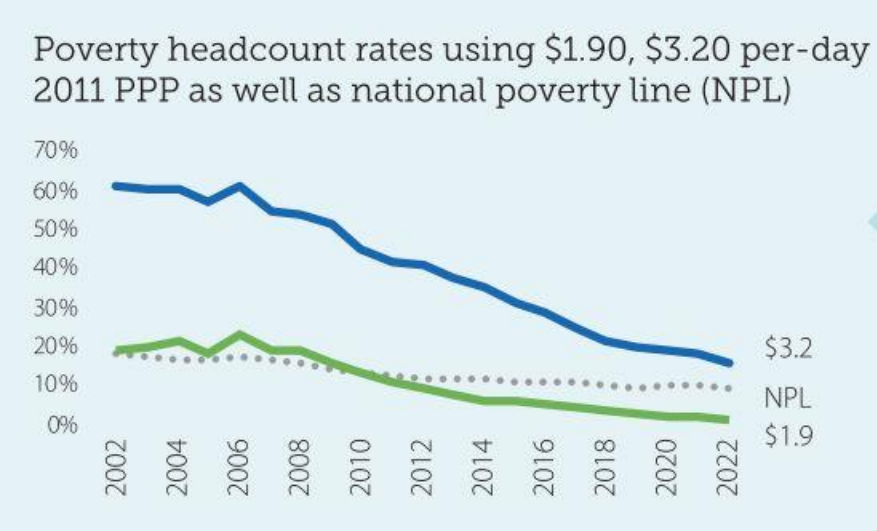

Fig 3: Poverty headcount rates

(Source: Pathways Towards Economic Security Indonesia Poverty Assessment, World Bank, 2023)

7-3 Languages

[9] Indonesia - The World Factbook (cia.gov)

[10] Pathways Towards Economic Security Indonesia Poverty Assessment, World Bank, 2023

More than 700 languages are used in Indonesia, which includes; Bahasa Indonesia (official, modified form of Malay), English, Dutch, local dialects (of which the most widely spoken is Javanese).

7-4 Ethnic Groups

There are 1,340 recognized ethnic groups in Indonesia.[11] The vast majority of those belong to the Austronesian peoples, with a sizeable minority being Melanesians.

The recognized largest ethnic group in Indonesia is the Javanese who make up about 40% of the total population. The Javanese are concentrated on the island of Java, particularly in the central and eastern parts. It is also the largest ethnic group in Southeast Asia. The Sundanese are the next largest group; their homeland is located in the western part of the island of Java and the southern edge of Sumatra. The Malays, Batak, Madurese, Betawi, Minangkabau, and Bugis are the next largest groups in the country.[12]

Many ethnic groups, particularly in Kalimantan and Papua, have only hundreds of members. Most of the local languages belong to the Austronesian language family, although a significant number of people, particularly in eastern Indonesia, speak unrelated Papuan languages.

[11] "Mengulik Data Suku di Indonesia" (in Indonesian). Statistics Indonesia. 18 November 2015. Retrieved 1 January 2021.

[12] Suryadinata, Leo; Arifin, Evi Nurvidya; Ananta, Aris (2003). *Indonesia's Population: Ethnicity and Religion in a Changing Political Landscape*. Institute of Southeast Asian Studies. ISBN 9789812302120.

Table 3: Number and percentage of population of ethnic groups with more than a million members according to the 2010 census.

Ethnic group	Population (millions)	Percentage	Main regions
Javanese	95.217	40.06	Bengkulu, East Java, East Kalimantan, Central Java, Jambi, Lampung, North Sumatra, Riau, South Sumatra, Yogyakarta
Sundanese	36.705	15.51	Banten, West Java
Malay	8.754	3.7	Bangka-Belitung Islands, Jambi, North Sumatra, Riau, Riau Islands, South Sumatra, West Kalimantan
Batak	8.467	3.58	North Sumatra, Riau, Riau Islands, Jakarta
Madurese	7.179	3.03	East Java
Betawi	6.808	2.88	Jakarta
Minangkabau	6.463	2.73	Riau, West Sumatra
Buginese	6.415	2.71	Central Sulawesi, East Kalimantan, North Kalimantan, South Sulawesi, Southeast Sulawesi, West Sulawesi
Bantenese	4.642	1.96	Banten
Banjarese	4.127	1.74	South Kalimantan, Central Kalimantan, East Kalimantan
Balinese	3.925	1.66	Bali
Acehnese	3.404	1.44	Aceh
Dayak	3.22	1.36	Central Kalimantan, East Kalimantan, North Kalimantan, West Kalimantan
Sasak	3.175	1.34	West Nusa Tenggara
Chinese Indonesian	2.833	1.2	Bangka-Belitung Islands, North Sumatra, akarta, Riau, Riau Islands, West Kalimantan, North Coast of Central Java and East Java.
Makassarese	2.673	1.13	South Sulawesi
Cirebonese	1.878	0.79	West Java
Lampungese	1.376	0.58	Lampung
Gorontaloan	1.252	0.53	Gorontalo
Palembangese	1.252	0.53	South Sumatra
Minahasan	1.24	0.52	North Sulawesi
Nias	1.042	0.44	North Sumatra

7-5 Cultural Heritage

Indonesia has a rich cultural heritage that has been shaped by long interaction between original

indigenous customs and multiple foreign influences. As of 2021, five cultural heritages are designated as UNESCO World Heritage in Indonesia. [13]

Table 4: List of UNESCO World Cultural Heritage

Site	Location	Year listed
Borobudur Temple Compounds	Magelang Regency, Central Java	1991
Prambanan Temple Compounds	Central Java and Special Region of Yogyakarta	1991
Sangiran Early Man Site	Sragen Regency, Central Java	1996
Ombilin Coal Mining Heritage of Sawahlunto	West Sumatra	2019
Cultural Landscape of Bali Province: the Subak System as a Manifestation of the Tri Hita Karana Philosophy	Bali	2012

Besides above, Indonesia has a lot of intangible cultural heritage; which includes; language, music, dance, ceremony, and various other structured behaviours. As of June 2020, 1,086 intangible cultural heritage are designated in the list of The Ministry of Education and Culture of Indonesia.

8 Legal Framework of Environmental and Social Considerations

8-1 Environmental administration

Regarding environmental administration, the Ministry of the Environment and Forestry (MEF) is the responsible agency at the central government level, and its responsibilities are as follows.

- Drafting environmental strategies, policies and environmental standards,
- Regulation and management of hazardous substances,
- environmental monitoring,
- competence development,
- Environmental Impact Assessment (AMDAL),
- Environment-related research,
- Collection of environment-related information,
- Environmental management and public relations activities, etc.

Directorate of Environmental Impact Prevention for Businesses and Activities (PDLUK) and Directorate of Environmental Impact Prevention Regional and Sector Policy (PDLKWS) are in charge of AMDAL.

[13] https://whc.unesco.org/en/statesparties/id

In addition, AMDAL committees (or, Feasibilty test Team / TUK) shall be established by local governments and the central government (Ministry of Environment and Forests) as responsible bodies for AMDAL procedures.

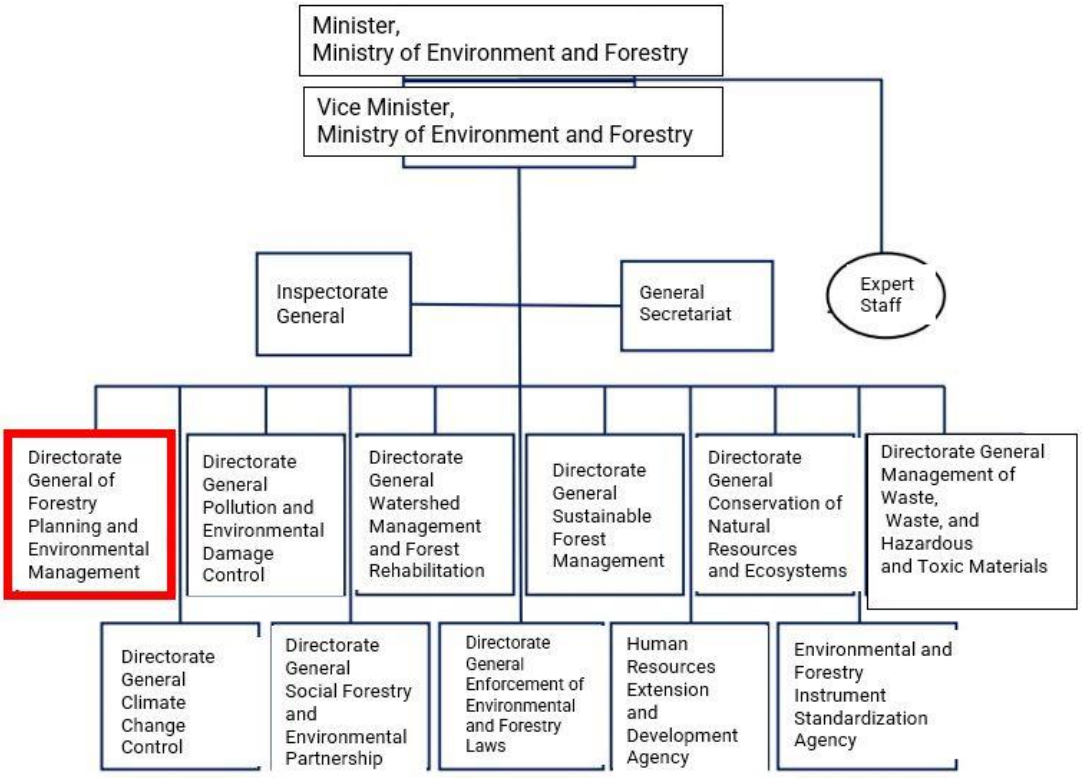

Fig 5: Organization chart of MEF

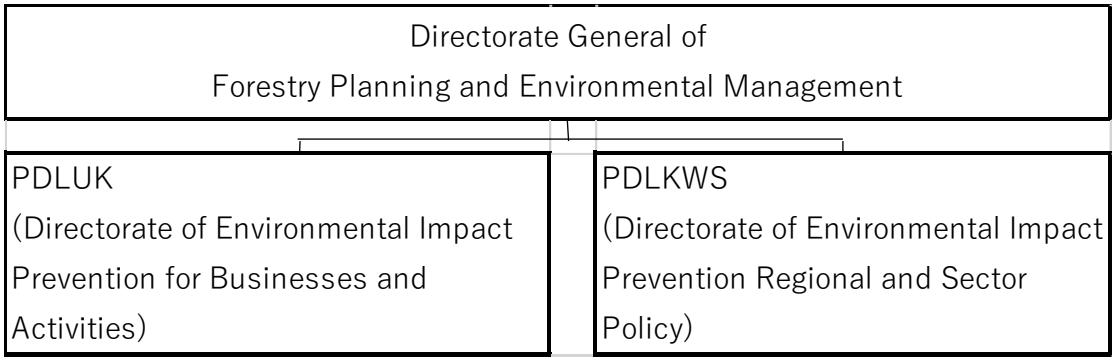

Fig 6: Organization chart of Directorate General of Forestry Planning and Environmental Management

8-2 Terminology

Table 5: Terms regarding Environmental and Social Consideration

Terms	Meaning
AMDAL(Analisis Mengenai Dampak Lingkungan)	Indonesia's environmental impact assessment (EIA) system, or EIA survey itself
ANDAL	Environmental Impact Statement, including results of environmtal impact analysis and evaluatioin, alternative, mitigation, etc
KA(Kerangka Acuan)	EIA preparatory document, defining the scope/TOR of EIA (AMDAL)
TUK (Tim Uji Kelayakan)	Feasibility Test Team, Also know as AMDAL committee, to be assigned by MEF or local government which consists of environmental agencies, experts, etc.
RKL	Environmental Management Plan
RPL	Environmental Monitoring Plan
SPPL	Statement of Ability to Manage and Monitor the Environment
KLHS (Kajian Lingkungan Hidup Strategis)	Strategic Environmental Assessment (SEA) or Strategic Environmental and Social Assessment (SESA)

8-3 Laws/Regulation

Table 6: Main Laws/Regulations regarding environmental and social consideration

Title(English transration)	Main Contents
Government Regulation No. 22 of 2021: Environmental Protection and Management:	EIA procesures, Environmental standards, etc
Law No. 32 of 2009 on Environmental Protection and Management.	EIA procesures
Regulation of Ministry of Environment and Forestry No. 4 of 2021: Types of Business Plans and/or Activities must have an analysis of Environmental Impacts	Screening
Government Regulation No. 46 of 2016: Procedures for Strategic Environmental	SEA(KLHS)
Government Regulation No. 19 of 2021: Implementation of Land Acquisition for Development in Public Interest	Land Acqisition

The main Indonesian laws on environmental management, i.e., Law No. 32 of 2009 on Environmental Management and Protection stated in Article 36 that any business and/or activity shall have and Environmental Approval either through an Environmental Impact Assessment Document (AMDAL) or an Environmental Management and Monitoring Effort (UKL-UPL). It is elaborated in more details under the Government Regulation No. 22 of 2021 on

Implementation of Environmental Protection and Management stated in Article 3 that an environmental approval shall be obtained by any business and/or activity through the preparation and feasibility assessment of AMDAL or the preparation and verification of UKL-UPL form. Through the Regulation of the Ministry of Environment and Forestry No. 4 of 2021 it is defined the types of business and/or activity that are required to prepare an AMDAL, UKL-UPL, or Capability Statement for Environmental Management and Monitoring (SPPL).

The Environmental Protection and Management Law (Law No. 22/2021) stipulates the basic matters related to environmental impact assessment as follows.

(1) Activities subject to AMDAL

- Projects/activities that involve modification of topography and natural landscape
- development of renewable and non-renewable natural resources;
- businesses or activities that may cause the consumption, destruction or degradation of natural resources;
- Projects/activities that may affect nature reserves and cultural properties
- introduction of new species of flora, fauna and micro-organisms;
- activities that pose a high risk and affect national security;
- application of advanced technologies that may have an impact on the environment;

(2) Contents to be included in ANDAL

- business impact analysis;
- evaluation of activities around the proposed project area;
- public suggestions and opinions on the project;
- Examination of the characteristics and quantitative impacts of project implementation
- an overall impact assessment to determine the environmental relevance of a project;
- Environmental management and monitoring plan

8-4 AMDAL Process

(1) Submission of business plan;

Proponent submits the business plan to the administrative authority.

The business plan format can be obtained from the environmental information system site (AMDAL.net), and the proponent can submit it to the project jurisdiction agency via the site.

Administrative responsible for the project will be the local government or the central government, depending on the scope of the project, etc., as shown below.

・Activities carried out in a single province or city

: province or city government

・Activities spanning multiple province and cities

: State government

・Activities spanning multiple states, activities related to national defense and security, activities in maritime areas, activities located on the borders of Indonesia and other countries, activities located in maritime areas, and other specific activities

: National government

(2) Screening

Based on the information contained in the business plan, it is classified into three stages (AMDAL, UKL-UPL, SPPL) according to the degree of impact, and the results are notified to the proponent within 30 days after receiving the plan.

Development of policy, plan, and program are not subject to AMDAL.

Table 7: Classification of AMDAL

Level of impact	Indonesia		JICA Guideline	
	Classification	Requirement	Category	Requirement
Large	AMDAL (ANDAL)	KAANDAL, ANDAL (includes UKL-UPL, and SPPL)	A	Full scale EIA (For master plan project, full scale SEA)
Medium	UKL-UPL	Environmental Management Plan, Environmental Monitoring Plan	B	IEE level survey (For master plan project, SEA at IEE level)
Small	SPPL	Only SPPL (statement) is required	C	-

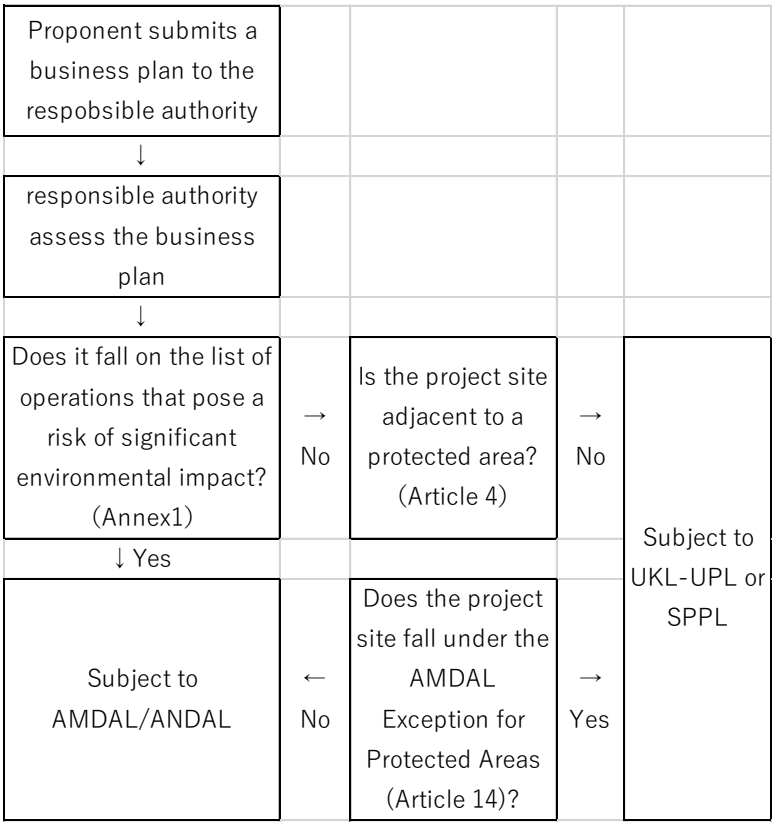

Fig 7: Screening Procedure

(Source: based on Regulation of Ministry of Environment and Forestry No. 4 of 2021)

Table 8: Screening standard for energy sector development project

Development activity	subject to		
	AMDAL	UKL-UPL	SPPL
Steam power plant (PLTU), Gas Power Plant (PLTG), Gas Engine Power Plant (PLTMG)	>100MW	<100MW	
Diesel Power Plant (PLTD)	>100MW	5-100MW	<5MW
Geo thermal power plant	implementation stage	survey stage	
Wind Power Plant	>50MW	1-50MW	<1MW
Solar Power Plant	>50MW	1-50MW	<1MW
Small Hydro power Plant		1-50MW	<1MW
Biomass Power Plant	>50MW	<50MW	
Biogas Power Plant	>50MW	<50MW	
Waste Power Plant	>50ton/day	<50ton/day	
Biofuel production factory	>100,000 Ton	<100,000 Ton	
Gas pipelines	>100km >12 inch	<100km <12 inch	
LPG factory	>50MMSCFD	<50MMSCFD	
LNG factory	>550MMSCFD	<550MMSCFD	
Regasification Terminal LNG	>550MMSCFD	<550MMSCFD	
Oil and Gas Processed Products Refinery	>10,000BOPD	<10,000BOPD	
Oil transportation			All size
Storage Facility for petroleum. Fue, oil, gas		All size	
Transmission line	>230kV	35-230kV	<35kV

(Source: Regulation of Ministry of Environment and Forestry No. 4 of 2021)

(3) Develop and review of TOR (KA)

If the project is judged to be subject to AMDAL, the proponent prepares the TOR based on the comments and opinions of the residents.

Feasibility Test Team (TUK) reviews the TOR. Proponent makes revisions as necessary based on comments from TUK and opinions of stakeholders.

TUK submits the evaluation results to the administrative responsible authority to be approved.

(4) Implement AMDAL survey and review documents.

- Proponent conducts AMDAL investigations and submit the reports (ANDAL, UKL-UPL) to the Feasibility Test Team (TUK). The investigation period given to the business operator shall be60, 120, or 180 days, depending on the nature and scale of the business.

- The proponent discloses ANDAL to the residents, and the residents submit opinions to TUK and the proponent as necessary.
- TUK reviews and evaluates the content of the ANDAL and the opinions of residents.
- TUK provide comments to the operator as necessary.
- Proponent makes revisions from time to time based on TUK comments and residents' opinions, and submits a revised ANDAL.
- Based on the evaluation results of the TUK, the final resolution (Environmental Approval) is issued by the approval authority of the environmental agency (prefectural governor/mayor, provincial governor, and environment minister).

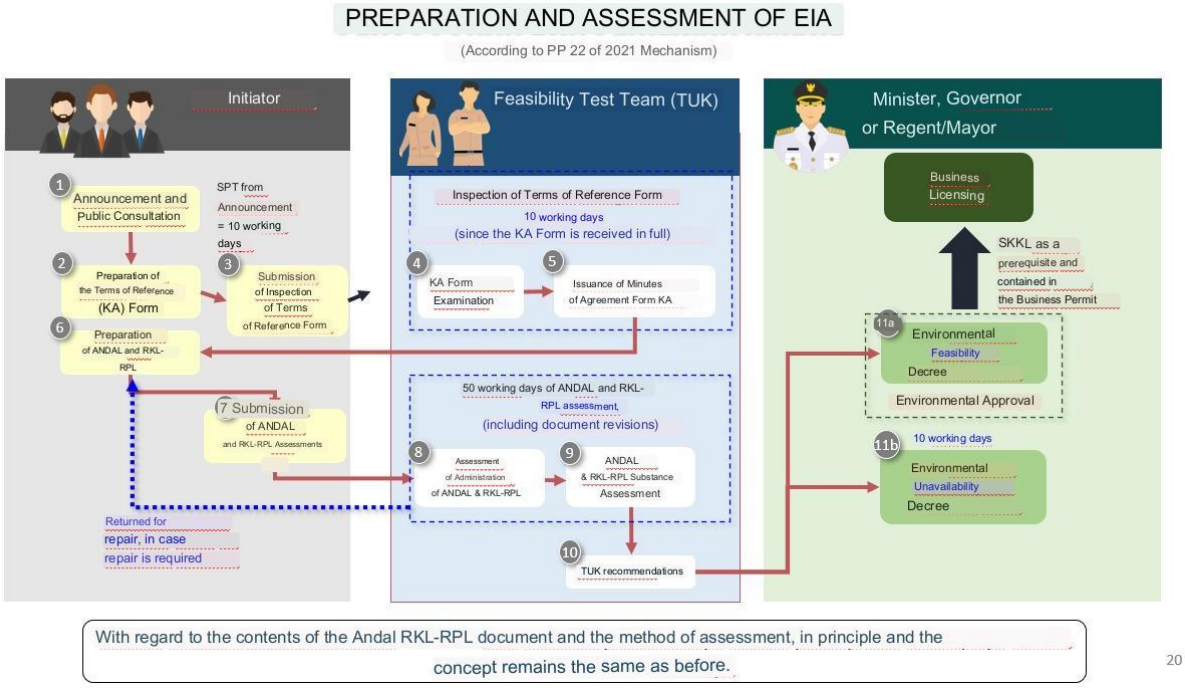

Fig 8: Preparation and Assessment of EIA
(Source: obtained from PLN)

8-5 Strategic Environmental Assessment (SEA) (KLHS)

(1) Activities subject to KLHS

It must be implemented into the preparation or evaluation of; regional spatial layout plans and their detailed plans, national development plan, regional development plan; and policies, plans, and/or programs that have the potential to cause impacts and/or risks. In addition, it must be carried out in the preparation or evaluation of the zoning plan for coastal areas and small islands along with the detailed plan. Plans regarding disaster emergency response or defense/security

emergencies are not subject to KLHS. [14]

After the consulting with PDLUK, MEF, it was confirmed that KLHS is not required for PLN to develop an Energy sector master plan under Indonesian law, since this is not a regional spatial plan.

(2) KLHS procedure

KLHS procedure consists of a) creation and implementation of KLHS; b) quality assurance and KLHS documentation; and c) KLHS validation.

a) Creation and implementation of KLHS

- assessment of the influence of Policies, Plans, and/or Programs on the condition of the Environment;
- formulating alternatives to improve Policies, Plans, and/or Programs
- preparation of recommendations for improvement for Policy, Plan and/or Program decision making that integrates the principles of Sustainable Development

b) Quality assurance and KLHS documentation

- KLHS quality assurance is carried out through self-assessment by Policy, Plan, and/or Program Makers which must consider the relevant Environmental Protection and Management Plan documents, and KLHS report of related and relevant Policies, Plans and/or Programs.
- The results of the KLHS quality assurance must be prepared in writing containing information about: eligibility for KLHS, and recommendation for improvement of KLHS which has been followed by improvement of Policies, Plans, and/or Programs.

c) KLHS validation

-Minister or Governor checks the completeness of applications (draft policy/plan/program, KLHS report, and proof of compliance with the KLHS Compiler competency standards). I
-If the results show the application is complete, minister or governor issue an approval.

8-6 Land acquisition

(1) Regulation

Government Regulation No. 19 of 2021 stipulates the procedure for acquisition of land for development in public interest, which is used for 24 types of development including electricity

[14] Government Regulation No. 46 of 2016: Procedures for Strategic Environmental

sector; such as power generation, transmission, distribution.

(2) The Stages of Land Acquisition

Land acquisition process consists of the four steps; 1) Planning, 2) Preparation, 3) Implementation, and 4) Hand Over.[15]

1) Planning

All agencies that require land for the development of public interest ("Agencies") are required to prepare a land acquisition plan which must be based on:

a. Spatial plan; and

b. Development priorities, which are listed in: Medium-term development plan; Strategic plan; and/or Agency work plan.

The Land Acquisition Plan is prepared in the form of a land acquisition planning document containing at least:

a. the aims and objectives of the development plan;

b. Suitability of Spatial Use Activities;

c. national/regional development priorities;

d. land location;

e. the required land area;

f. general description of land status;

g. the estimated time period for the implementation of Land Procurement;

h. the estimated timeframe for development implementation;

i. estimated land value;

j. budget plan; and

k. preference form of Compensation.

2) Preparation

After receiving the land acquisition planning document, the Governor carries out the stages of Land Acquisition preparation activities and forms a Preparation Team.

The Preparatory Team have tasked of:

a. carry out notification of development plans;

b. carry out initial data collection on the location of the development plan;

c. carry out Public Consultation on development plans;

d. prepare the Determination of the location of development;

e. announce the Determination of Development Locations for Public Interest;

f. carry out other tasks related to the preparation of Land Acquisition for

[15] Government Regulation No. 19 of 2021

development in the Public Interest assigned by the governor.

3) Implementation

The implementation of land acquisition is carried out by the head of the Regional Office of the National Land Agency (in Bahasa: Kepala Kantor Wilayah Badan Pertanahan Nasiona) no later than five working days after the receipt of the application for land acquisition.

The implementation process includes:

a. Implementation preparation;
b. Inventory and identification of data;
c. Determination of appraisers;
d. Provision of compensation;
e. Release of land acquisition object; and
f. Documentation of land acquisition administration data.

4) Hand Over

The Head of Land Acquisition Executor (in Bahasa: Ketua Pelaksana Pengadaan Tanah) will then submit the results of the land acquisition to the Agency together with the land acquisition data no later than 14 days after the relinquishment of the rights to the object of land acquisition.

(3) Electronic Land Acquisition System

Government Regulation No. 19 of 2021 stipulates the electronic system as the main means in the implementation of land acquisition activities carried out for the development of the public interest. As a result, the results of the implementation of electronic land acquisition in the form of data, information and related electronic documents, are currently recognized as valid legal evidence and an extension of legal evidence in accordance with the procedural law in force in Indonesia.

8-5 Gap analysis between Indonesian laws/regulation and JICA's Guidelines

Result of the brief analysis are summarized in the attachments below.

Detailed analysis will be implemented during the master plan project.

Attachment 1: Gap Analysis (Env and Social Consideration)

Attachment 2: Gap Analysis (Land Acquisition and Involuntary Resettlement)

9 Provisional Scoping (types and magnitudes of possible adverse impacts)

Provisional scoping is carried out assuming two projects for the purpose of CCS utilization and

ammonia co-firing, which may be considered to be an activity after the implementation of the master plan (The activity itself is not a scope in this project).

Background for selecting these assumed projects for provisional scoping:

Proposed Activity 3.5 above exemplifies use of CCS and hydrogen/ammonia as activities that may be considered for the "Zero emission thermal power development plan."

Utilization of hydrogen and ammonia includes some options such as; 1) Ammonia Co-Firing, 2) Ammonia 100% Firing, 3) Hydrogen Co-Firing, 4) Hydrogen 100% Firing.

Among these, the ammonia co-firing, which is likely to be put into practical earlier than other options was selected as a target for preliminary scoping together with CCS.

It does not mean these two projects will be prioritized in the master plan. During master plan support stage to examine best mix for zero emission scenario, a full-fledged scoping will be carries out to examine alternatives including Ammonia 100% Firing, Hydrogen Co-Firing, Hydrogen 100% Firing, and other options, if any.

Table 9: Assumed project and activities for provisional scoping

Assumed Project	Main activities which may have impact on environment and socials
Introduce CCS to an existing thermal power plant	● Survey for CCS site selection ● Construct plant for CO2 separation, and capture. ● Develop CO2 injection wells ● Connect pipelines to transfer CO2 between the power plant, and CCS site, ● Operate/maintain the CCS system
Co-firing with ammonia at a thermal power plant	● Modify fuel procurement system, ● Develop infrastructure for fuel transport; such as gas pipelines, sea transport, land transport by trailer/lorry ● Operate the fuel transport system. ● Develop facilities such as ammonia storage tanks, gasification plant ● Modify burner and fuel injection system ● Operate/maintain the co-firing system

Table 10: Provisional Scoping of the Project

(Introduction of CCS to an existing thermal power plant)

***Individual project will not be planned in this project**

No.	Impact Item	Rating		Description of Impacts/Reasons for Rating
		Const. Phase	Operation Phase	
Pollution				
1	Air pollution	B-	B-/B+	[Construction Stage] ➢ Air pollution caused by heavy machines and vehicles is expected. ➢ Air pollution by dust around roads and other places is expected. [Operation and monitoring stage (O&M stage)] ➢ Emission of NOx, SOx, and Ammonia may change
2	Water pollution	B-	B-	[Construction Stage] ➢ Water pollution by oil and others from heavy machines and vehicles is expected. ➢ Water pollution by surplus soil from underground facility construction sites containing minerals is expected. [O&M stage] ➢ The impact of plant wastewater, oil-containing wastewater, domestic wastewater, thermal wastewater, etc., are expected by the plant operation. ➢ Unplanned or accidental CO2 releases may cause acidification of natural water resources.
3	Waste	B-	B-	[Construction Stage] ➢ Wastes from construction sites are expected. [O&M stage] ➢ Wastes; such as ash, FGD residues, Sulfur, spent CCS sorbent are generated.
4	Soil pollution	B-	B-	[Construction Stage] ➢ Soil contamination by oil and others from heavy machines and vehicles is expected. ➢ Soil contamination by surplus soil from underground facility construction sites containing minerals from is expected. [O&M stage] ➢ During operation of the transport system or storage site or post closure of the storage site, abnormal releases of CO2 could reduce soil OH, resulting in depleted soils and mobilization of heavy metals.

5	Noise and vibration	B-	B-	[Construction Stage] ➢ Noise and vibration from heavy machines and vehicles are expected. ➢ Noise and vibration during road works are expected. ➢ Noise and vibration during boring survey for site selection are expected [O&M stage] ➢ Noise and vibration may be generated from the CCS system.
6	Ground subsidence	B-	B-	[Construction Stage] ➢ There is a risk of ground subsidence due to construction work under ground. [O&M stage] ➢ There is a risk of ground subsidence during the process of storing CO2.
7	Offensive odors	C	C	[Construction Stage] [O&M stage] Details of impacts (including their existences) are not known because specific plans are not available, but the following items should be noted ➢ Odor may become a problem in case waste or sewage are not properly treated during construction, or O&M phase.
8	Bottom sediment	B-	C	[Construction Stage] ➢ Negative impact is expected by digging a well into the ground that pumps carbon dioxide into it. [O&M stage] ➢ Details of impacts (including their existences) are not known because specific plans are not available,
Natural Environment				
9	Protected areas	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
10	Ecosystem	B-	B-	[Construction Stage] [O&M stage] ➢ Negative impacts to ecosystems are expected due to noise, vibration, water pollution, soil pollution above.
11	Hydrology	C	C	Details of impacts (including their existences) are not known because specific plans are not available, but the following items should be noted [Construction Stage] ➢ Groundwater hydrology can be affected through the construction and physical presence of the pipeline and capture plant. [O&M stage] ➢ Surface water hydrology can be affected by the additional abstraction requirements of the capture plant, leading to reductions in the river water flow.
12	Geographical features	C	C	[Construction stage] Construction works may cause soil erosions. [O&M stage] Details of impacts (including their existences) are not known because specific plans are not available.

Social Environment				
13	Resettlement/ Land Acquisition	C	D	[Planning stage] Details of impacts (including their existences) are not known because specific plans are not available, but the following items should be noted. ➢ In case involuntary relocation is unavoidable, develop a resettlement plan after consultation with the residents, and necessary measures such as compensation should be taken. [O&M stage] ➢ No activities which give negative impacts are planned.
14	Poor people	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
15	Ethnic minorities and indigenous peoples	C	C	There are many ethnic groups and cultures in Indonesia. Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
16	Local economies, such as employment, livelihood, etc.	B+	B-	[Construction stage] ➢ Employment by the Project is expected. [O&M stage] ➢ Unemployment may become an issue after the completion of construction.
17	Land use and utilization of local resources	B-	C	[Planning stage] ➢ Land use and utilization of local resources may change. [O&M stage] Details of impacts (including their existences) are not known because specific plans are not available, but the following items should be noted ➢ Abnormal CO2 contamination of drinking water and oil and gas reservoirs may eliminate these resources from future usage. ➢ CCS power plant requires more resources such as; fuel, limestone, ammonia, CCS reagents, compared to without CCS power plant. [16]
18	Water usage	C	B-	[Construction stage] Details of impacts (including their existences) are not known because specific plans are not available. [O&M stage] ➢ Power plants, with CCS, use more water than those of without CCS. [17]
19	Existing social infrastructures and services	C	C	[Construction stage] [O&M stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.

[16] CCS guidelines, World Resources Institute, 2008
[17] CCS guidelines, World Resources Institute, 2008

20	Social institutions such as social infrastructure and local decision-making institutions	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
21	Misdistribution of benefits and damages	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
22	Local conflicts of interest	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
23	Cultural heritage	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
24	Landscape	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
25	Gender	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
26	Children's rights	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
27	Infectious diseases such as HIV/AIDS	B-	C	[Construction stage] ➢ Infectious diseases may be spread because of the inflow of external workers. [O&M stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
28	Working conditions (including occupational safety)	B-	B-	[Construction stage] ➢ Accidents of workers are expected. ➢ Diseases caused by dust are expected. ➢ These can temporarily disturb their human health and security. [O&M stage] ➢ Accidents during maintenance activities are expected.

29	Accidents	B-	B-	[Construction stage] ➢ Accidents due to malfunction or mis-operations of construction machinery are expected. ➢ Traffic accidents during material transportation are expected [O&M stage] ➢ Accidents may occur in each process such as; CO2 separation/capture, transportation, storage, and maintenance.
Other				
30	Trans-boundary impacts or climate change	B-	A+	[Construction stage] ➢ Emissions from heavy machines and vehicles are expected. [O&M stage] ➢ Contribute to the reduction of carbon emissions at regional level by exporting electricity to neighboring.

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of positive/negative impact is unknown. A further examination is needed, and the impact could be clarified as the study progress.

D: No impact is expected

Table 11: Provisional Scoping of the Project

(co-firing with ammonia at an existing thermal power plant)

***Individual project will not be planned in this project**

No.	Impact Item	Rating		Description of Impacts/Reasons for Rating
		Const. Phase	Operation Phase	
Pollution				
1	Air pollution	B-	B-/B+	[Construction Stage] ➢ Air pollution caused by heavy machines and vehicles is expected. ➢ Air pollution by dust around roads and other places is expected. [Operation and monitoring stage (O&M stage)] ➢ Amount of NOx, PM2.5 may increase, while SOx may decrease.
2	Water pollution	C	D	[Construction Stage] ➢ Details of impacts (including their existences) are not known because specific construction plans are not available. [O&M stage] ➢ No activities which give negative impacts are expected.

3	Waste	B-	B-	[Construction Stage] ➢ Waste is generated through construction work [O&M stage] ➢ Generation of fly ash and bottom ash are expected
4	Soil pollution	C	C	[Construction Stage] [O&M stage] No activities which give negative impacts are expected. Details of impacts (including their existences) are not known because specific plans are not available, but the following items should be noted ➢ In case wastes are disposed on the soil without proper treatment, soil pollution may occur. ➢ In case pipelines are installed underground, there is a possibility of soil pollution due to leakage of ammonia.
5	Noise and vibration	B-	C	[Construction Stage] ➢ Noise and vibration from heavy machines and vehicles are expected. ➢ Noise and vibration during road works are expected. ➢ Noise from blasting is expected. [O&M stage] Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
6	Ground subsidence	D	D	[Construction Stage] [O&M stage] No activities which give negative impacts are expected.
7	Offensive odors	B-	B-	[Construction Stage] [O&M stage] There is a risk of odor caused by ammonia leakage.
8	Bottom sediment	D	D	[Construction Stage] [O&M stage] No activities which give negative impacts are expected.
Natural Environment				
9	Protected areas	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
10	Ecosystem	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
11	Hydrology	D	D	[Construction Stage] [O&M stage] No activities which give negative impacts are expected.
12	Geographical features	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
Social Environment				

13	Resettlement/ Land Acquisition	C	D	[Planning stage] [Construction stage] Details of impacts (including their existences) are not known because specific plans are not available, but the following items should be noted. ➢ In case involuntary relocation is unavoidable, develop a resettlement plan after consultation with the residents, and necessary measures such as compensation should be taken. [O&M stage] ➢ No activities which give negative impacts are planned.
14	Poor people	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
15	Ethnic minorities and indigenous peoples	C	C	There are many dialects (or languages) and cultures in Bangladesh. Although details of impacts (including their existences) are not known, the Project understands these cultures well and develops the plan of the country to achieve a balanced society.
16	Local economies, such as employment, livelihood, etc.	B+	B+	[Construction stage] ➢ Employment of local constructor may be expected. [O&M stage] ➢ Employment in supply chain of hydrogen-based fuel is expected.
17	Land use and utilization of local resources	B-	B-	[Planning stage] [Construction] ➢ Installation of pipelines, ammonia storage tanks, etc. will render the land space unusable for other uses. [O&M stage] ➢ Consume ammonia resources
18	Water usage	D	D	[Planning stage] [O&M stage] ➢ While a power plant needs a lot of water, the amount is not expected to significantly increase by co-firing.
19	Existing social infrastructures and services	B-	B-	[Construction stage] ➢ Existing transport infrastructure may be affected during construction work. [O&M stage] ➢ In case utilize existing gas infrastructure to transport hydrogen-based fuel to the power plant, it may affect the transport of LPN, etc.
20	Social institutions such as social infrastructure and local decision-making institutions	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
21	Misdistribution of benefits and damages	C	C	[Planning stage] [Construction stage] [O&M stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.

22	Local conflicts of interest	C	C	[Construction stage] [O&M stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
23	Cultural heritage	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
24	Landscape	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
25	Gender	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
26	Children's rights	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
27	Infectious diseases such as HIV/AIDS	B-	C	[Construction stage] ➢ Infectious diseases may be spread because of the inflow of external workers. [O&M stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
28	Working conditions (including occupational safety)	B-	B-	[Construction stage] ➢ There is a possibility of accidents involving workers and local people caused by mis-operation of construction vehicles or heavy machines. It can temporarily disturb their human health and security. [O&M stage] ➢ Explosion may occur when handling flammable gases
29	Accidents	B-	B-	[Construction stage] ➢ Accidents due to malfunction or mis-operations of construction machinery are expected. ➢ Traffic accidents during material transportation are expected [O&M stage] ➢ Explosion may occur when handling flammable gases
Other				
30	Trans-boundary impacts or climate change	B-	A+	[Construction stage] ➢ Emissions from forest clearance are expected. ➢ Emissions from heavy machines and vehicles are expected. [O&M stage] ➢ Contribute to the reduction of carbon emissions at regional level by exporting electricity to neighboring.

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of positive/negative impact is unknown. A further examination is needed, and the impact could be clarified as the study progress.

D: No impact is expected

10 Result of the consultation with recipient government on environmental and social considerations including roles and responsibilities

The Detailed Planning Survey mission team explained PLN and MEMR about the "Guidelines for Environmental and Social Considerations, JICA, January 2022" which requires SEA and information disclosure. They have basically understood the essence.

11 Terms of Reference for Environmental and Social Considerations

SEA will be implemented in the Project at master plan level according to "Guidelines for Environmental and Social Considerations, JICA, January 2022". Its procedures and methods will be discussed and decided through coordination among the stakeholders during the Project. Terms of Reference (TOR) for the study of environmental and social considerations to be conducted in this project shall include, but not limited to, the followings.

(1) Review the goals/objectives for energy development planning
(2) Review the contents of the existing policies/plans/programs and examine the issues on environmental and social aspects for energy development planning
(3) Identify legal framework and institutions of Republic of Indonesia on environmental and social considerations, and SEA cases in Indonesia
    1) Laws, regulations, and standards related to environmental and social considerations (e.g., those related to SEA, environmental and social impact assessment, resettlement, land acquisition, public participation, information disclosure).
    2) Gaps between the JICA Guidelines and the legal framework of Republic of Indonesia on environmental and social considerations and how they will be filled in the Project.
    3) Organizations responsible for implementation of environmental and social considerations including SEA.
    4) SEA cases implemented in Indonesia
(4) Confirm whether the Project is subject to SEA by the laws in Indonesia.
(5) Examine the methods to implement SEA for the Project

(6) Conduct comparative analysis of alternatives to realize the goals/objectives

(7) Conduct scoping (clarify crucially important items on environmental and social impacts and its evaluation methods to be taken into account in the decision making such as policy, plan, and program levels)

(8) Identify baseline data on existing environmental and social conditions of the target area (e.g., land use, environmental pollution, natural environment, socio-economic situation, socio-cultural environment, lifestyle of indigenous people and communities)

(9) Predict and evaluate potential impacts, and compare with alternatives including "without project option" and "zero option", and select the optimal plan.

(10) Identify measures to mitigate the impacts in the optional plan (i.e., measures to avoid, minimize, or compensate the negative impacts)

(11) Identify monitoring methods based on the mitigation measures.

(12) Conduct consultations with local stakeholders, based on stakeholder analyses. The results of consultations should be reflected in the project plan.

12 **Attachment**

- Attachment 1: Gap Analysis (Environmental and Social Consideration)
- Attachment 2: Gap Analysis (Land Acquisition and Involuntary Resettlement)

(end)

Attachment 1: Gap Analysis (Environmental and Social Consideration)

		JICA Guidelines	Government Regulation No. 22 of 2021 : Environmental Protection and Management	Government Regulation, No. 46, 2016 Procedures of SEA	Difference between the two rules
1	Basic Principles	Environmental and social impacts caused by projects must be assessed and examined at the earliest possible planning stage. Alternatives or mitigation measures must be examined, in order to avoid such impacts as much as possible, and to minimize, reduce or mitigate them when such avoidance is impossible. The result of the examinations must be reflected into the project plan.	-Include consideration of alternatives in the ANDAL (environmental impact statement). (Article 39) -Develop and implement Environmental Management Plan (RKL) to avoid, control and mitigate negative impacts. (Annex 2)	KLHS is very important because it becomes the basis for policy, plan and/or program decision making. If the principles of Sustainable Development have been considered and integrated into development decision making, it is hoped that the possibility of negative impacts of a Policy, Plan and/or Program on the Environment can be avoided.	No significant gaps
2	Examination of Measures	Multiple alternatives must be examined in order to avoid or minimize adverse impacts by the project and to choose better project options in terms of environmental and social considerations. In the examination of measures, priority is to be given to avoidance of environmental impacts. When this is not possible, minimization, reduction, and then mitigation of the impacts must be considered, in accordance with the mitigation hierarchy. Compensation measures must be examined only when significant impacts are still remain even with the aforementioned measures.		Alternatives to improving Policies, Plans and/or Programs must be considered (Article 15)	No significant gaps
3	Strategic Environmental Assessment (SEA)	SEA is required for master plan project categorizes "A" or "B"	While there are some description about SEA in the article 10, and Annex 1 (Lampiran), it is not clear whether mandatory or not.	National level or regional development plan is subject to SEA	Energy sector master plan is not ncessesarily subject to SEA under Indonesian law
4	Scope of Impacts to Be Assessed	The impacts to be assessed with regard to environmental and social considerations include impacts on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, accidents, water use, climate change, biodiversity, and ecosystem services, including trans-boundary or global scale impacts. In addition to the direct and immediate impacts of projects, derivative, secondary, and cumulative impacts as well as impacts associated with indivisible projects are also to be examined and assessed to a reasonable extent. It is also desirable to consider the impacts through a project life cycle.	In addition to environmental items (air, soil, water, noise, ecosystem), socio-economic aspects (social activity patterns, community economy, public health, resettlement) should be investigated. (Annex 1) Scoping formats are developed by government agencies. (Article 36)	scope to be assessed will be identified through analysis of the contents of the Policy, Plan and/or Program(Article 12) cumulative nature of impact should be considered (Article 9)	No clear description about secodaly impact in the national law

		JICA Guidelines	Government Regulation No. 22 of 2021：Environmental Protection and Management	Government Regulation, No. 46, 2016 Procedures of SEA	Difference between the two rules
5	Compliance with Laws, Standards, and Plans	Projects must comply with the laws, ordinances, and standards related to environmental and social considerations established by host country governments, including local governments. Projects must also conform to the environmental and social consideration policies and plans of the host country governments.	Environmental standards are set to comply with. (Annex 6-8)	Legislation should be analyzed trhough the process of SEA (Article 12,)	No significant gap
6	Social Acceptability (public consultation)	Projects must be adequately coordinated so that they are accepted in a socially appropriate manner for the countries and areas where the projects are planned. For Projects with potentially significant environmental and social impacts, sufficient consultations with local stakeholders, such as local residents, must be conducted via disclosure of information at an early stage, at which time alternatives for project plans are examined. The outcome of such consultations must be incorporated into the project plans. Appropriate considerations must be given to vulnerable social groups.	Consultwith local community when develop a business plan. (Article 22) Publish the project plan to residents who may be affected, hold consultation meetings, and seek their opinions (Article 28)	Issues of Sustainable Development should be identified by gathering input through public consultation. "(Article 9)	No significant gap
7	Climate Change	For projects that are expected to generate more than a certain amount of greenhouse gas emissions, the total amount of greenhouse gas emissions will be estimated and disclosed before the project implementation	no description	Level of vulnerability and adaptation capacity to climate change should be analysed through SEA process (Article 13)	No specific provision for this item is stipulated in the national law.
8	Biodiversity	Projects must not involve significant conversion or significant degradation of critical habitats or critical forests. Illegal logging of forests must be avoided. Project proponents need to obtain logging permits from regulatory agencies, and are encouraged to obtain forest certifications for forestry projects, in order to ensure the prevention of illegal logging.	Projects in areas rich in ecosystems are subject to EIA, requiring detailed environmental impact assessment studies and mitigation measures.	Resilience and potential for biodiversity will be assessed (Article 9)	No significant gap
9	Involuntary Resettlement and Loss of Livelihood	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible even after such examination, effective measures to minimize impacts and to compensate for losses must be taken upon agreement with the affected people.	No specific description in GR No. 22 of 2021	threat to the sustainability of people's livelihoods should be considered (Article 9)	there are some gaps. Pls. refer to another gap analysis with Law No. 19/2021 (concerning land acquisition for the development of public interest)"
10	Indigenous Peoples	Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible even after such examination, effective measures for indigenous peoples must be taken to minimize the impacts and to compensate for the losses.	no description	Issues of Sustainable Development should be identified including "issues of Sustainable Development "(Article 9)	No specific provision for this item is stipulated in the national law.

		JICA Guidelines	Government Regulation No. 22 of 2021：Environmental Protection and Management	Government Regulation, No. 46, 2016 Procedures of SEA	Difference between the two rules
11	Monitoring	During the project implementation, project proponents monitor whether any unforeseeable situations occur, and the performance and effectiveness of the planned mitigation measures. Project proponents take appropriate measures based on the results of such monitoring. Project proponents must ensure that the project plans include feasible monitoring plans. When third parties point out specifically that environmental and social considerations are not being fully undertaken, project proponents should make efforts to reach an agreement on the procedures to resolve the problems, through forums for discussions and examinations of the countermeasures with participation of stakeholders involved in the projects, based on sufficient information disclosure.	Monitoring is required in accordance with the monitoring plan in Environmental Management Plan. Results are regularly submitted to the Ministry of the Environment or local governments, but there is no obligation to disclose them to local stakeholders.	Monitoring and evaluation should be carried out (chapter5)	There is a gap in the disclosure of monitoring results
12	Grievance Redress Mechanism	A mechanism for handling concerns and grievances from people and communities affected by the project's environmental and social impacts must be in place. The grievance redress mechanism needs to be easily accessible for the project affected people and communities. Project proponents disseminate the information about the grievance redress mechanism through consultations with local stakeholders. The project affected people and communities must not be disadvantaged by filing a grievance.	Grievance is controled through public consultation process	Grievance is controled through public consultation process. (Article 8)	No significant gap
13	Information Disclosure	In principle, project proponents disclose information about environmental and social considerations of their projects. JICA assists the project proponents through implementing cooperation projects as needed. Project proponents disclose information well in advance when they have consultations with local stakeholders in cooperation with JICA. On such occasions, JICA supports project proponents in preparation of documents in an official or widely used language(s) and in a form understandable by local peoples.	Disseminate the business plan to potentially affected residents. (Article 28) -The project plan shall be published in the language of the place where the project is to be implemented, in addition to the Indonesian language. (Article 30) -Environmental assessment reports will be published on the Internet through the environmental information system. (Article 35)	KLHS(SEA) report is disclosed (article 23)	No significant gap, excepting monitoring results above.

Attachment 2: Gap Analysis (Land Acquisition and Involuntary Resettlement)

	JICA Guidelines/World Bank ESS5	Law No. 19/2021 (concerning land acquisition for the development of public interest)	Difference between the two rules
1	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. (JICA GL)	No specific provision for this item is stipulated in the national law.	No specific provision for this item is stipulated in the national law.
2	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. (JICAGL)	No specific provision for this item is stipulated in the national law.	No specific provision for this item is stipulated in the national law.
3	Project affected people, such as people to be resettled involuntarily and/or people who may lose their livelihoods by the project, must be provided sufficient compensations and supports by the project proponents in a timely manner. (JICAGL)	Land Acquisition means the activity of providing land by giving proper and fair compensation. (Article 1) In special circumstances, such as emergencies, immediate compensation is available. (Article 86)	National law does not specifically stipulate measures for restoration of livelihood and standard of living
4	Compensations must be calculated at full replacement cost as much as possible, and provided in advance. (JICAGL)	Land procurement for public interest is conducted by granting adequate and fair compensation determined based on the assessment by a licensed land appraiser.	National law does not stipulate valuation for the compensation based on the full replacement cost. In practice, appraisal of assets is made following technical guidelines SPI 306, which defines the basis of measurement for physical assets (at market value) and non-physical assets, respectively.
5	Project proponents must make efforts for the affected people to improve or at least restore their standards of living, income opportunities and production levels to the pre-project levels. (JICAGL)	no description	No specific provision for standards of living is stipulated in the national law.
6	Compensation standards are disclosed and consistently applied. The project affected persons need to be aware of the compensation standards.	Values of objects below are estimated for compensation: a. land; b. Overground Space and Underground Space; c. buildings; d. plants; e. objects related to land; and f. other losses that can be assessed	TBC
7	In principle, the contents of the individual compensation to be agreed are explained to the project affected persons in writing, and the project affected persons can confirm the contents at any time.	"minutes of the deliberation agreement on the determination of Compensation" must be prepared as a part of Land Acquisition Data (LAD). Copy and electronic data of LAD will be stored.	It is not clear if the affected persons can get the copy or not under the national law
8	For projects that result in large-scale involuntary resettlement, a Resettlement Action Plans (RAP) must be prepared and made available to the public prior to the resettlement and provision of compensation and support. (JICAGL)	the implementation of land procurement for public services is based under the principles of humanity, justice, favorable, certainty, transparency, consensus, participation, prosperity,	No specific provision for this item is stipulated in the national law.

	JICA Guidelines/World Bank ESS5	Law No. 19/2021 (concerning land acquisition for the development of public interest)	Difference between the two rules
9	In preparing the RAP, consultations must be held with the project affected people and communities, based on sufficient information made available to them in advance. (JICAGL)	Public consulation is required on development plans. (Article 11) The report should be complied in "Land Acquisition data" (Article112)	It is not clear if sufficient information must be provided in advance under the national law.
10	When consultations are held, explanations must be given in languages and forms that are understandable to the project affected people. (JICAGL)	no description	No specific provision for this item is stipulated in the national law.
11	Appropriate participation of the project affected people and their communities must be promoted in the planning, implementation and monitoring of measures against involuntary resettlement and loss of livelihood. (JICAGL)	The implementation of land procurement for public services is based under the principles of humanity, justice, favorable, certainty, transparency, consensus, participation, prosperity, sustainability and harmony. The means of “participation principle” is the support for land procurement implementation through the society participation, whether directly or	National law does not stipulate resettlement; therefore, there are no provisions for the participation of affected persons in planning, implementation and monitoring of the resettlement action plan.
12	A mechanism for handling concerns and grievances from people and communities affected by the project’s environmental and social impacts must be in	People and communities affected have opportunity to express their concerns during public consultation process.	No significant difference.
13	the Borrower will, as part of the environmental and social assessment, conduct a census to identify the persons who will be affected by the project, to establish an inventory of land and assets to be affected, to determine who will be eligible for compensation and assistance, and to discourage ineligible persons, such as opportunistic settlers, from claiming	Initial data collection survey must be carried out by Land Acquisition Preparation Team.	No significant difference.

	JICA Guidelines/World Bank ESS5	Law No. 19/2021 (concerning land acquisition for the development of public interest)	Difference between the two rules
14	Affected persons may be classified as persons: (a) Who have formal legal rights to land or assets (b) Who do not have formal legal rights to land or assets, but have a claim to land or assets that is recognized or recognizable under national law; or (c) Who have no recognizablelegal right or claim to the land or assets they occupy or use. (ESS5 para10) the Borrower will offer affected persons compensation at replacement cost, and other assistance as may be necessary to help them improve or at least restore theirstandards of living or livelihoods, subject to the provisions of paragraph 26 through 36 of this ESS. (ESS5 para 12)	"Entitled Parties " consisits of; a. holders of Land Rights; b. Management Rights holders; c. nazhir for waqf land; d. holders of written evidence of the old rights; e. customary law communities; f. parties who control State Land in good faith; g. the holder of the basis for land control; and/or h. owner of buildings, plants, or other objects related to land (Article 18) Conpensation must be provided to Entitled Parties in accordance with minutes of agreement. (Article 74)	No significant difference.
15	Where livelihoods of displaced persons are land-based, or where land is collectively owned, the Borrower will offer the displaced persons an option for replacement land in accordance with paragraph 35(a), unless it can be demonstrated to the Bank's satisfaction that equivalent replacement land is unavailable.	no description	No specific provision for this item is stipulated in the national law.
16	Transitional support will be provided as necessary to all economically displaced persons, based on a reasonable estimate of the time required to restore their income earning capacity, production levels, and standards of living.(ESS5 para36)	no description	No specific provision for this item is stipulated in the national law.
17	Particular attention will be paid to gender aspects and the needs of the poor and the vulnerable.(ESS5 para26)	no description	No specific provision for this item is stipulated in the national law.
18	To address the issues identified in the environmental and social assessment, the Borrower will prepare a plan proportionate to the risks and impacts associated with the project (ESS5 para21)	no description	No specific provision for this item is stipulated in the national law.