BUMN UNTUK INDONESIA

PLN

Taskforce on Nature-related Financial Disclosure

TNFD REPORT 2023

Adopter of TNFD Recommendation Global

DIRECTOR'S STATEMENT

As the Director of Transmission and System Planning at PLN, I am committed to integrating nature-related financial disclosures into our operational practices. We recognize the considerable environmental and biodiversity impacts of our activities, and we are dedicated to transparently reporting these effects in accordance with the TNFD framework. Our objective is to enhance our understanding of nature-related risks, refine our management practices, and reaffirm our commitment to sustainable development.

To uphold this commitment, PLN has implemented comprehensive measures to assess and mitigate the potential impacts of our projects on the natural environment. This approach includes rigorous environmental impact assessments, proactive risk management strategies, and continuous monitoring of our environmental performance. The following Taskforce on Nature-related Financial Disclosures report will provides insights into our initiatives and progress, highlighting our dedication to minimizing our ecological and biodiversity footprint.

In conclusion, our 2023 TNFD Report illustrates our steadfast commitment to sustainability. We are determined to advance our nature-focused objectives with all stakeholders. As we look to the future, PLN remains devoted to fostering positive change and contributing to a sustainable and prosperous Indonesia.

Jakarta, November 2024

Evy Haryadi
Director of Transmission and System Planning

PREFACE

I am pleased to present this first report on PLN's Taskforce on Nature-related Financial Disclosures (TNFD). This report outlines our nature-related financial disclosures, and includes our governance, strategy, risk management, metrics, and targets. We see this publication as a significant advancement in enhancing transparency concerning nature-related risks. Understanding the nature-related factors, including biodiversity and ecology, is essential to fulfilling this commitment.

The importance of nature extends not only to its ecological significance, but also to its contributions to human well-being. Healthy ecosystems provide vital services, such as clean air, water, and sustainable food sources. Consequently, biodiversity conservation is critical for our survival. Sustainability is a collective responsibility that involves PLN's management, employees, and business partners. We are committed to implementing Sustainable Business Principles across all our operations. In response to the increasing concerns regarding the impact of corporate activities on nature, we are actively enhancing our commitment following the TNFD recommendations. We aim to effectively manage nature-related risks and opportunities as we advance toward national and global targets.

This report marks the commencement of our journey with the Taskforce on Nature-related Financial Disclosures, detailing our current position and identifying areas for further development. We anticipate collaborating with stakeholders and providing updates in future reports. We also extend our gratitude to WWF-Indonesia for their invaluable support in helping PLN develop this TNFD report and build capacity for TNFD implementation. Their guidance and expertise have been instrumental in shaping our approach to sustainability and nature-related disclosures.We highly value our dedication to sustainability and nature conservation, which positively influences our performance and reputation. On behalf of PLN, I sincerely thank all stakeholders for recognizing the significance of nature and biodiversity loss as critical issues and supporting our transformation toward sustainability. Together, we can raise awareness, inspire action to protect biodiversity and dedicate ourselves to preserving our planet. While the path ahead will present opportunities and challenges, let us collectively strive to achieve PLN's vision for a sustainable future.

Kamia Handayani
Executive Vice President
Energy Transition and Sustainability

TABLE OF CONTENT

LIST OF FIGURES

TABLE LIST

LIST OF ABBREVIATIONS

ArcGIS	Geographic Information System
BKSDA	Nature Resource Conservation Centre
BMG	Biodiversity Management Guidlines
BOC	Board of Commissioners
BOD	Board of Directors
CCPP	Combine Cycle Power Plant
CCTV	Closed-Circuit Television
CFPP	Coal Fired Power Plant
COC	Corporate Communication and CSR
COP	Conference of The Parties
CR	Critically Endangered
CSR	Corporate Social Responsibility
DPP	Diesel Power Plant
EIA	Environment Impact Assessment
ENCORE	Exploring Natural Capital Opportunities, Risks, and Exposure
ESG	Environmental, Social, and Governance
ESMS	Environment and Social Management System
ETS	Energy Transition and Sustainability
EVP	Executive Vice President
FGD	Forum Group Disscussion
GFPP	Gas Fired Power Plant
GIIP	Good International Industry Practice
GOI	Generation Operations and Independent Power Producer
GPP	Geothermal Power Plant
HPP	Hydro Power Plant
HSSE	Health, Safety, Security, Environment
Ibat	Integrated Biodiversity Assessment Tool
IBSAP	Indonesian Biodiversity Strategic Action Plan
IFIs	International Finance Institutions
IFRS	International Financial Reporting Standards
ISO	International Organization for Standardization
ISSB	International Sustainability Standards Board
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Areas
KMGBF	Kunming Montreal Global Biodiversity Framework
KOMMA	The Mangrove Muara Angke Community
KONTAK PAKJALI	Conservation of Endemic Plants to Feed Bali Starlings using Pampers Waste Planting Media
KSDA	Conservation of Natural Resources
LCA	Life Cycle Assessment
LEAP	Locate, Evaluate, Assessment, Prepare
NDC	Nationally Determined Contribution
NGOs	Non-Governmental Organization
NZE	Net-Zero Emission

PLN	Perusahaan Listrik Negara
POMU	Power Generation and Operation & Maintenance Service Unit
PROPER	Public Disclosure Program for Environmental Compliance
PTP	Pre-Treatment Plan
REC	Renewable Energy Certificate
RJPP	Corporate Long-Term Plan
RKAP	Corporate Workplan and Budget
RUPTL	Electricity Supply Business Plan
SDGs	Sustainable Development Goals
STRATA	Addition of Aren Fibre Strainer as Filtration in Pre-Treatment Basin
SWBP	Sea Water Booster Pump
SWR	Sustainability War Room
TCFD	Taskforce on Climate-related Financial Disclosure
TNFD	Taskforce on Nature-related Financial Disclosure
UBP	Generation Business Unit
UP	Generation Unit
UN-CBD	United Nations-Convention on Biological Diversity
WWF	World Wide Fund for Nature

TNFD CORE CONTENT

The TNFD's Main Elements	TNFD Disclosures	Pages
Business Profile 	a) Describes the conditions of the general power plants and sample power plants selected for disclosure in the initial version of this report based on the LEAP Approach and TNFD recommendations	a) 13 - 16
Governance 	a) Describes the BOD commitment, responsibilities and management's role in governance structure b) Describes nature related experience and engagement stakeholder including local communities	a) 17 - 20 b) 20 - 22
Strategy 	a) Identifies the sensitive locations and high biodiversity areas b) Describes the nature-related risks and opportunities with scape physical and reputational risk category c) Describes PLN's strategic decisions with related to nature programs and stakeholder engagement	a) 23 - 28 b) 28 - 30 c) 31 - 38
Risk Management 	a) Identifies and scoring nature related to physical and reputational risk, impact and PLN's action to minimize risk and impact	a) 39 - 49
Metrics & Targets 	a) Discloses the nature-related metrics based on strategy and risk include biodiversity, reforestation, and emission reduction b) Describes the targets used for managing nature in line with PLN's strategy, IBSAP, and KMGBF	a) 50 b) 51 -52

EXECUTIVE SUMMARY

BACKGROUND

PLN's dedication to biodiversity conservation and ecosystem restoration, aligns with the global and national goals in the Indonesian Biodiversity Strategic Action Plan (IBSAP), and Kunming Montreal Global Biodiversity Framework (KMGBF). These frameworks emphasize the critical relationship between climate, nature, and business. By integrating biodiversity management into its operations, PLN supports one of national targets for conserving and restoring the ecosystems. PLN has instigated various initiatives to minimize the operational impact in high-biodiversity areas while engaging local communities and stakeholders. Additionally, PLN's participation in the Taskforce on Nature-related Financial Disclosure (TNFD) enhances its ability to manage nature-related risks, and contributes to broader sustainability efforts, ensuring a balance between business growth and environmental preservation.

BUSINESS PROFILE

PLN is Indonesia's largest state-owned electricity provider, and is committed to sustainable energy production and minimizing impact on nature. By adopting the TNFD approach, PLN enhances transparency in reporting and actively manages nature-related risks. This is demonstrated by its disclosure at 33 power plants, sampled across Sumatra to Sulawesi, following the Locate, Evaluate, Assess, and Prepare (LEAP) Approach and TNFD recommendations. The company focuses on managing its dependency and impact on ecosystems, particularly in high-biodiversity areas such as Mount Salak Geothermal Power Plant (GPP), Gilimanuk Gas Fired Power Plant (GFPP), Keramasan Combine Cycle Power Plant (CCPP), and Muara Karang CCPP. This report underscores PLN’s efforts in biodiversity conservation, risk mitigation, and sustainability strategies, reflecting its commitment to balancing operational efficiency with environmental preservation.

GOVERNANCE

PLN commit to biodiversity conservation, shown in its strategic integration of environmental sustainability into corporate governance. The BoD has taken comprehensive measures to align the PLN operations with the national biodiversity goals, outlined in the Indonesian Biodiversity Strategy & Action Plan (IBSAP). In 2022 the ETS Division to reinforce PLN's focus on managing nature-related risks. In collaboration with key stakeholders, including local communities and conservation agencies, PLN adopted a proactive approach to reforestation and biodiversity monitoring. Governance structures such as the Internal Audit, Risk Management Directorate and Sustainability Committee ensure that nature-related impacts are effectively managed across PLN's operations. This commitment is further underscored by PLN receiving prestigious awards like the Green Leadership Award and the Indonesian Green Awards, alongside implementing initiatives monitored through the Sustainability War Room (SWR).

STRATEGY

Some of the 33 power plants sampled are located in sensitive areas with high biodiversity value, such as National Parks and Key Biodiversity Areas (KBA), which serve as crucial habitats for endangered species. Spatial analysis using tools like the World Wide Fund for Nature (WWF) Biodiversity Risk Filter, Integrated Biodiversity Assessment Tool (iBAT), and Geographic Information System (ArcGIS) in four power plants situated in areas of high biodiversity including Mount Salak GPP, Gilimanuk GFPP, Keramasan CCPP, and Muara Karang CCPP. To mitigate nature-related risks, these four plants have instigated various strategies, including initiatives aimed at protecting endemic species. For example, the Mount Salak GPP is dedicated to safeguarding and monitoring the endangered Javan Hawk-Eagle. Additionally, stakeholder engagement programs align PLN's sustainability efforts with broader goals for nature conservation and social impact.

RISK MANAGEMENT

PLN is strongly committed to identifying and managing nature-related risks and opportunities in its business strategy and financial planning. To achieve its nature-related targets, PLN employs a three-lines-of-defense strategy, incorporating risk assurance, supervisory functions, and management supervision by the BoD. This approach is underpinned by a comprehensive risk management framework aligned with ISO 31000:2018, which ensures systematic risk identification, analysis, and mitigation. The framework is further supported by specific Director's Regulations on Integrated Risk Management, as detailed in the 2023 Environmental, Social, Governance (ESG) Performance Report. PLN prioritizes evaluating physical and reputational risks, including water availability, land use changes, deforestation, pollution, protected areas or KBAs, ecosystem health, species range rarity, socioeconomic factors, media attention, and political dynamics. To tackle these risks, PLN has developed and implemented targeted mitigation strategies to manage them effectively.

METRICS AND TARGET

Nature-related metrics are vital for assessing power plants' environmental impact and sustainability, especially in high biodiversity areas. These metrics support regular evaluations to minimize environmental impacts and track progress in biodiversity and reforestation initiatives. PLN monitors flora and fauna biodiversity indexes annually, which have shown positive trends in species diversity near power plants. In addition to biodiversity protection, reforestation efforts are prioritized, with specific targets for capacity building, using biodiversity tools like iBAT, ecosystem service management, and transparent reporting through ESG and sustainability reports.

BACKGROUND

The Paris Agreement, established during the COP21 conference, set an ambitious goal of limiting global warming to 1.5°C above pre-industrial levels while advancing efforts to adapt to and mitigate climate change. Complementing this, the Task Force on Climate-related Financial Disclosures (TCFD) has developed a framework to guide these initiatives. At this stage, natural systems are recognized as vital in addressing the need to identify and manage the risks and opportunities tied to ecosystems and biodiversity. The TNFD outlines this approach, emphasizing how it would affect ecosystems and biodiversity. These three initiatives can synergistically strengthen the understanding and management of environmental risks, integrate climate and nature considerations into business strategies, and support global efforts to achieve sustainability and environmental conservation goals. Climate change and environmental degradation are interrelated, and understanding the impacts on biodiversity is becoming increasingly important for companies in managing long-term risks.

Furthermore, all human endeavors, including commerce and economics, rely on the natural world. Like traditional capital, natural capital sees the environment as having a value that increases with investment and decreases with destruction. If societal standards surrounding the preservation of nature change, this presents a serious concern. The first worldwide agreement on biodiversity management, the United Nations Convention on Biological Diversity (UN-CBD) aims to preserve, manage sustainably, and guarantee the fair distribution of benefits. As a result of the COP-15 refining process, the KMGBF was created as a biodiversity strategy plan. It is an essential roadmap for accomplishing the Sustainable Development Goals (SDGs) by 2030 and ensuring that humans and the environment coexist peacefully by 2050. In addition to global targets, Indonesia has its own national targets, which form the basis for sustainability strategies through IBSAP from 2025 to 2045, which the Ministry of Environment and Forestry recently released. This is further reinforced by Indonesian Presidential Instruction No. 1 of 2023, which focuses on integrating biodiversity conservation into sustainable development. This policy mandates that all institutions establish sector policies prioritizing biodiversity conservation, apply fair principles for utilizing nature, and enforce laws protecting biodiversity.

One of the national and global targets outlined in both IBSAP and KMGBF is to enhance efforts to conserve and restore degraded ecosystems. This target is also relevant to PLN's operational activities in several areas with high biodiversity value. To support the national targets, it is crucial for PLN to align its operations with objectives focused on ecosystem restoration and biodiversity management while implementing mitigation measures to minimize negative impacts. Currently, PLN demonstrates a strong commitment to integrating biodiversity management into its corporate policies, reflecting a proactive approach toward sustainable practices. The biodiversity management plan has guided efforts to achieve this commitment since 2015. As part of this, PLN has initiated minimizing the direct impacts of construction on biodiversity important areas, focusing on the immediate and medium-term needs of the critically endangered and endangered species, protecting and expanding forest habitats to connect the biodiversity important areas into the broader landscape while addressing the indirect impacts on biodiversity, engagement with local peoples and community development programs. By integrating biodiversity conservation measures into its operations, PLN has significantly contributed to the achievement of national IBSAP targets, while also strengthening the company’s overall sustainability strategy.

In the future, PLN aims to adopt a more strategic approach to enhance biodiversity and nature risk management and furnish stakeholders, such as lenders and investors, with more comprehensive information. PLN commitment on a global scale is also implemented through its participation as a TNFD adopter to start making public disclosures in line with TNFD LEAP Approach and Recommendations. This TNFD report will also enable PLN to systematically monitor and manage its nature impacts, while supporting both national and global initiatives to protect species and ecosystems. By integrating conservation and sustainability into its operations, PLN is strengthening its commitment to balancing business growth with environmental stewardship, in line with the IBSAP and KMGBF objectives.

TNFD RECOMMENDATION

As a TNFD Adopter, PLN is committed to sharing nature-related information and supporting the TNFD's framework for evaluating and disclosing risks and opportunities tied to natural capital. PLN has pledged to publish its first TNFD Report to identify and address nature-related dependencies, impacts, risks, and opportunities. The TNFD framework is built around four pillars—governance, strategy, risk management, and metrics and targets—aligning with the TCFD and ISSB to integrate nature into decision-making and promote nature-positive financial flows in line with the Global Biodiversity Framework.

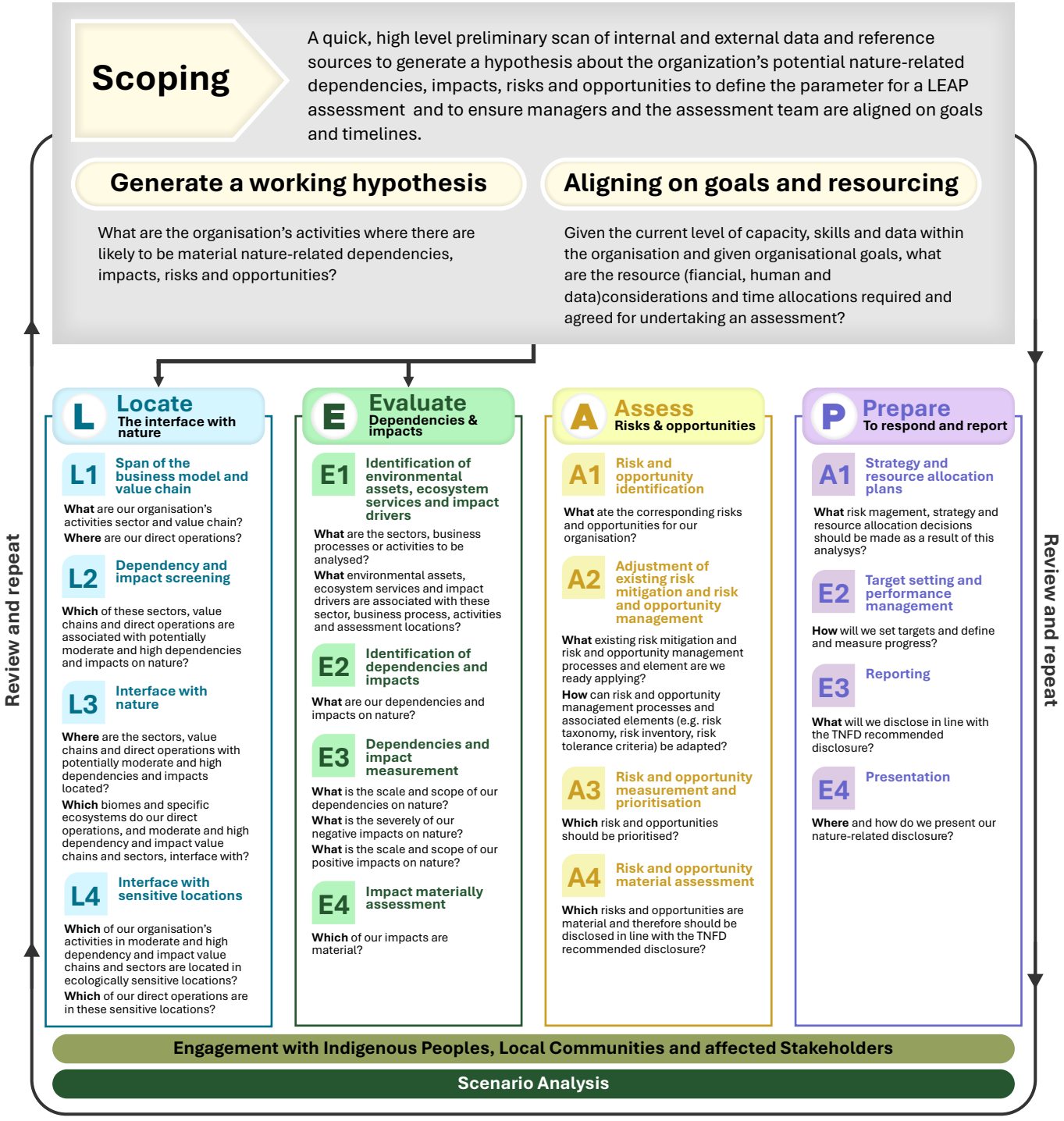


Figure 1: The TNFD approach for the identification and assessment of nature-related issues[1]

1. TNFD Global, https://tnfd.global/wp-content/uploads/2023/11/TNFD-in-a-Box-Module-4_-The-LEAP-Approach.pdf, accessed at July 8th 2024

The TNFD has published guidelines for preparing disclosures utilizing the LEAP approach. The LEAP approach assists businesses and finances in implementing recommendations by providing a systematic procedure for recognizing, evaluating, and documenting nature-related opportunities, risks, and impacts. This approach also provides PLN with a comprehensive understanding of nature-related risks and opportunities, enabling us to make more informed decisions and to integrate these into our strategic planning and reporting processes. We can enhance our transparency and accountability by disclosing this information to investors, lenders, and other stakeholders and drive positive action towards more sustainable business practices. The LEAP approach allows us to determine which nature-related issues should be considered for reporting in alignment with TNFD's required disclosures.

BUSINESS PROFILE

TNFD REPORT

Taskforce on Nature-related Financial Disclosure

PT PLN (Perusahaan Listrik Negara) is a state-owned company in Indonesia's electricity sector. As Indonesia's largest electricity utility and power sector company, PLN is responsible for providing reliable and sustainable electricity nationwide. PLN has operational activities in various sectors ranging from production to distribution and is responsible for the operation of power plants from multiple energy sources, both renewable and fossil energy. Its two main power generation sub-holdings, PT PLN Indonesia Power (IP) and PT PLN Nusantara Power (NP), serve to enhance PLN's capacity to advance sustainable energy initiatives and power generation across Indonesia.

PT PLN Indonesia Power (previously named PT Indonesia Power) plays a vital strategic role, operating power plants nationwide and expanding its offerings through the Beyond kWh business, providing comprehensive energy solutions. PT PLN Nusantara Power (formerly PT Pembangkitan Jawa-Bali), established in 1995, operates with a generating capacity of 18.573 MW distributed throughout the archipelago and also contributes through subsidiary businesses in generator operation and maintenance services, investment partnerships, spare parts supply, and various support services.

These power plants are strategically distributed across Indonesia and include the following types:

- Coal Fired Power Plants (CFPP) use coal as the primary fuel and contribute to most of the nation's electricity production.
- Gas-fired Power Plants (GFPP) is powered by natural gas, offer high efficiency in generating electricity and Combined Cycle Power Plants (CCPP) is a type of thermal power plant that uses a gas turbine and a steam turbine to generate electricity, these both of power plants significantly contribute to the national grid.
- Renewable Energy Power Plants, as part of efforts to increase the use of cleaner energy, PLN operates several renewable energy plants, such as hydropower, solar, and wind. Hydropower harnesses water resources, particularly in areas with abundant water supplies, while solar and wind energy support Indonesia's transition to a cleaner, more sustainable energy future.

The electricity these power plants generate is transmitted through a vast high-voltage transmission network spread across the country. This network is designed to transport electricity from generation centers to load centers across various regions. After passing through the transmission network, electricity is distributed to industrial, commercial, and household consumers through medium and low-voltage networks.

Given the wide and diverse scope of its operations, PLN continually strives to enhance efficiency in every sector while prioritizing using cleaner and more environmentally friendly energy sources. This strategic approach strengthens PLN's role as a crucial player in meeting the nation's energy needs. However, the extensive nature of PLN's operational activities—including generation, transmission, and distribution—entails significant dependencies on and impacts on ecosystems. To assess and understand the scope of these dependencies and impacts, PLN has conducted a comprehensive evaluation using ENCORE. This tool provides an in-depth representation of how PLN's activities interact with nature and the extent of their ecological impact.

Table 1. Materiality ratings of dependencies on ecosystem service

Category	Ecosysytem Service	Biomassa	Geothermal	Hydropower	Fossil Fuels	Solar	Wind	Transmission and Distribution
Provisioning Service	Biomass provisioning	H	-	-	-	-	-	-
	Water supply	L	M	VH	H	M	VL	VL
Regulating and maintenance service	Air filtration	VL	VL	-	VL	-	-	-
	Flood mitigation	VL	M	VH	M	M	-	M
	Global climate regulation	VL	VL	ML	M	VH	VH	VL
	Local (micro and meso) climate regulation services	L	L	L	L	M	M	-
	Noise attenuation services	-	VL	-	VL	VL	M	VL
	Rainfall pattern regulation services (at sub-continental scale)	M	-	-	-	-	-	VL
	Soil and sediment retention services	L	H	VH	M	M	M	L
	Solid waste remediation	L	L	L	M	-	-	L
	Storm mitigation services	VL	VL	M	L	M	M	M
	Water flow regulation services	L	L	VH	H	M	M	
	Water purification services	M	M	L	M	-	-	-

Very High · High · Medium · Low · Very Low

Table 2. Materiality ratings of impact on ecosystem service

Category	Ecosysytem Service	Biomassa	Geothermal	Hydropower	Fossil Fuels	Solar	Wind	Transmission and Distribution
Land/freshwater/ ocean-use change	Area of freshwater use	-	-	H	M	-	-	L
	Are of seabed use	-	-	-	-	-	M	L
	area of land use	H	L	M	M	L	H	M
	Volume of water use	M	M	L	M	L	L	VL
Climate change	Emission of GHG	H	M	L	VH	-	-	VL
Resource exploitation	Disturbance	H	M	H	VH	VL	M	L
	Other biotic resource extraction	M	-	-	-	-	-	-
Pollution/ pollution removal	Emission of non-GHG air pollutants	H	H	-	VH	-	-	VL
	Generetion and release of solid waste	H	VL	L	H	VL	VL	L
	Emissions of toxic pollutants to water and soil	M	M	-	VH	L	VL	L

Very High · High · Medium · Low · Very Low

Overall, the materiality ratings provide valuable insight into the importance of ecosystem services for PLN's operational sustainability and emphasize the need for effective mitigation strategies in natural resource management. This data underscores the necessity for PLN to address and minimize its environmental impacts. In response, PLN remains fully committed to implementing a wide range of sustainability initiatives that align with responsible nature management principles. By adopting the TNFD framework, PLN continues to enhance transparency in nature-related impact reporting and take strategic actions to manage risks associated with natural resources. This demonstrates PLN's dedication to being an energy company that not only focuses on financial performance but also prioritizes the preservation of nature for a more sustainable future.

For this initial version of the TNFD report, 33 power plants sampled were selected for disclosure based on the LEAP Approach and TNFD recommendations. These power plants, which include the CCPP, CFPP, GFPP, DPP, HPP, and GPP sectors, are distributed across various regions, from Sumatra to Sulawesi. The selection of these 33 plants falls under the PROPER category, as regulated by the Ministry of Environment and Forestry's Regulation No. 1 of 2021, which pertains to the company's environmental management performance rating assessment. Below is the list of the 33 power plants sampled:

Sumatra

1. Pangkalan Susu CFPP
2. Tenayan CFPP
3. Borang GFPP
4. Keramasan CCPP
5. Indralaya CCPP
6. Suge CFPP

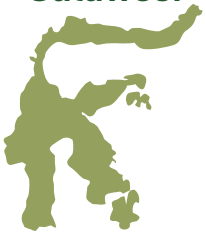
Java

1. Suralaya CFPP
2. Cilegon CCPP
3. Lontar CFPP
4. Muara Karang CCPP
5. Priok CCPP
6. Muara Tawar CCPP
7. Indramayu CFPP
8. Mount Salak GPP
9. Palabuhan Ratu CFPP
10. Cirata HPP
11. Saguling HPP
12. Kamojang GPP
13. Adipala CFPP
14. Pacitan CFPP
15. Paiton CFPP
16. Grati CCPP
17. Gresik GFPP
18. Tanjung Awar-awar CFPP
19. Rembang CFPP

Bali

1. Gilimanuk GFPP
2. Pesanggaran DPP
3. Pemaron GFPP

Sulawesi



1. Lahendong GPP
2. IPP Lahendong GPP
3. Punagaya CFPP
4. Tello DPP
5. Barru CFPP

Given the sampling of these 33 power plants, PLN must understand dependency and impact on nature, as the company's operations rely heavily on natural resources and the environment. Understanding this dependency and impact is essential to ensure long-term business continuity. PLN's reliance on natural resources, such as water for hydroelectric power generation and geothermal heat for geothermal power generation, makes preserving healthy ecosystems a top priority. By understanding the dependencies and impacts related to nature, PLN can make wiser decisions, ensure operational sustainability, and minimize nature risks, thereby supporting the company's vision of being a responsible and sustainable energy provider. This knowledge also enables PLN to identify critical areas requiring focus and implement mitigation measures to reduce risks. Additionally, it allows PLN to proactively design sustainability strategies that protect biodiversity and support sustainable development.

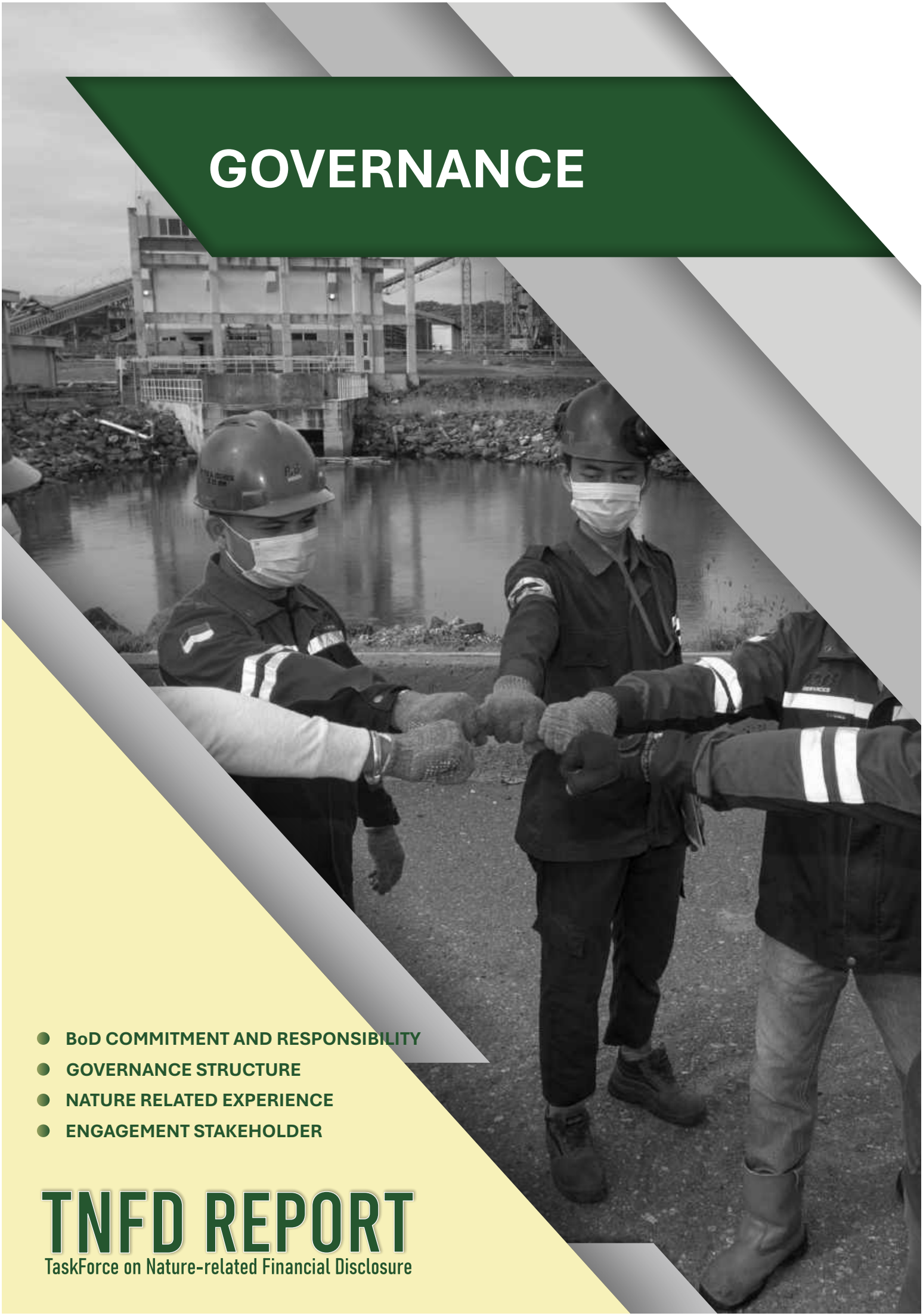
Of the total PROPER-registered plants, not all locations require the same focus and mitigation measures. Power plants in critical areas, such as high biodiversity areas (National Parks and KBA), require a specific sustainability strategy to protect nature. This strategy should include thorough risk identification, appropriate mitigation measures, and ongoing monitoring to ensure that operations do not harm sensitive ecosystems. Currently, only four power plants are situated in high biodiversity areas:

1. Mount Salak GPP
2. Gilimanuk GFPP
3. Keramasan CCPP
4. Muara Karang CCPP

This report focuses on these four power plants, emphasizing identifying strategies, risks, opportunities, and actionable targets that can be implemented in stages. The primary objective is to ensure that PLN continues to operate environmentally sustainably while reinforcing its responsibility toward biodiversity conservation.

Given these high-biodiversity areas' unique ecological value, the report explicitly highlights strategies to protect and enhance biodiversity. By adopting the TNFD approach, PLN strengthens its commitment to transparency in biodiversity impact reporting. This methodology allows for more informed and strategic decisions to manage nature-related risks, ensuring that biodiversity is prioritized alongside operational efficiency. This underscores PLN's broader commitment to evolving into an energy company that prioritizes financial performance and leads in biodiversity conservation efforts, thus contributing to a more sustainable future.

GOVERNANCE



- BoD COMMITMENT AND RESPONSIBILITY
- GOVERNANCE STRUCTURE
- NATURE RELATED EXPERIENCE
- ENGAGEMENT STAKEHOLDER

TNFD REPORT

TaskForce on Nature-related Financial Disclosure

BoD COMMITMENT AND RESPONSIBILITY

The importance of environmental sustainability has been on the rise both in Indonesia and globally. As a result, the PLN BoD has decided to integrate environmental considerations into the company's planning and decision-making processes. Given Indonesia's abundant biodiversity and vulnerability to the impacts of climate change, sustainable practices have gained significant importance in PLN's corporate governance. The PLN boards have pledged to protect natural heritage and conservation areas, mitigate environmental degradation risks, and enhance their organizations' long-term resilience and reputation by addressing nature-related issues. These initiatives demonstrate a commitment to corporate social responsibility aligned with the global trend towards sustainability, to ultimately contributing to broader sustainable development goals. PLN's concern for the environment goes beyond mere formalities; it reflects the knowledge and experience of PLN's board members and division units.

As part of its commitment to environmental sustainability, the BoD established a new division in 2022, the ETS Division. This division is responsible for developing environmental sustainability strategies, including nature-related management, and has various sustainable skills backgrounds. In addition, the existing HSSE Division supervises the fulfillment of National Regulations on Environmental Protection and is supported in the Head Office and branch units.

This commitment was also fulfilled by establishing several nature-related policies and roles, which are summarized below:

- Biodiversity and Land Restoration Policy to carry out sustainable and responsible practices to manage biodiversity and conservation;
- Statement of Corporate Intents No. 0314 of 2022 concerning the Sustainable Business Principle;
- Director’s Regulation No. 0110 of 2023 concerning Strategic Policy for Environmental Protection and Management;
- Safety, Occupational Health, Security, and Environmental Policy in 2023.

PLN adheres to a mitigation hierarchy for biodiversity management as outlined in its BMG. This guideline is key for biodiversity management and mitigation strategies across PLN Holding and its subsidiaries. It details actions to avoid, minimize, restore, and offset potential environmental impacts, including those required by regulatory permits. The hierarchy emphasizes avoiding operations in areas with high biodiversity values, minimizing impacts, and undertaking restoration and compensation efforts where necessary. These efforts span the planning, construction, and operational to post-operation phases, aiming to achieve no net loss or positive impact on biodiversity.

To maintain business continuity and contribute to realizing the SDGs, PLN is committed to performing its operational activities based on the values and principles of sustainability. For instance, the ESMS Document has been prepared to establish a framework for the company to identify, assess, prevent, mitigate, evaluate, and communicate environmental and social risks and impacts. In line with PLN's commitment to strengthening environmental and social sustainability, the ESMS will be applied in internal workflows and processes to ensure investment and operational activities meet international sustainability standards.

The ESMS reflects PLN's dedication to responsible environmental stewardship and social accountability, offering a comprehensive approach and manual that considers both environmental and social aspects. The ESMS includes manuals and management guidelines that provide a framework for effective environmental and social aspect.

In addition, four power plants sampled in this report have developed specific policies related to biodiversity protection. Three power plants under the supervision of PT PLN Indonesia Power (Mount Salak GPP, Gilimanuk GFPP, and Keramasan CCPP) have adopted the following policies:

- The Board of Directors Decree No. 41.K/010/IP/2012 concerning Occupational Health and Safety within PT Indonesia Power.
- The Board of Directors Decree No. 211.K/010/IP/2016 concerning Commitment to Protecting and Conserving

Ecosystems to Ensure Planetary Sustainability at PT Indonesia Power.
- PT PLN Indonesia Power UBP Kamojang Unit Mount Salak GPP Environmental Management Policy, 2023.
- PT PLN Indonesia Power Unit Keramasan GFPP Environmental Management Policy, 2023.

Similarly, Muara Karang CCPP, under PT PLN Nusantara Power, has established biodiversity protection policies to support the achievement of SDGs as outlined in the following:
- PT PLN Nusantara Power Unit Muara Karang Senior Manager Decision No. 0013.K/020/UPMK/2023.
- PT PLN Nusantara Power Unit Muara Karang Senior Manager Decision No. 0023.K/SM UP Muara Karang/2024 concerning Environmental Management Policy at PT PLN Nusantara Power UP Muara Karang, 2024.

PLN has enhanced its environmental stewardship by implementing programs designed to address unforeseen nature impacts, ensuring quick recovery and effective remediation. The company fully complies with all applicable regulations, follows industry best practices, and regularly reports on biodiversity management to the relevant authorities. Through these efforts, PLN reaffirms its dedication to sustainability and its responsibility to protect biodiversity across all its operations.

Table 3 illustrates the number of certified personnel supporting PLN's commitment to environmental sustainability, particularly in water pollution, air pollution, and hazardous waste management. These certifications demonstrate PLN's proactive measures to ensure that all operational activities comply with national environmental protection regulations. The distribution of these certifications among personnel across PLN's various units highlights the company's preparedness to implement sustainable environmental practices consistently and effectively throughout its operational areas.

Table 3. Number of personnel certifications

Type of Certification	Number of Personnel
Water Pollution Control Certification (SIMPEL)	651
Water Pollution Control Certification (NONSIMPEL)	836
Total Water Pollution Control Certification	**1487**
Air Pollution Control Certification (SIMPEL)	873
Air Pollution Control Certification (NONSIMPEL)	743
Total Air Pollution Control Certification	**1616**
Hazardous Waste Management Certification (SIMPEL)	537
Hazardous Waste Management Certification (NONSIMPEL)	650
Total Hazardous Waste Management Certification	**1187**
Total Certification	**4290**

GOVERNANCE STRUCTURE

The BOD has established a governance structure to handle nature-related matters directly supervised by them. Stakeholder management can assist in crisis management and business continuity planning; therefore, successful stakeholder management requires strong leadership commitment and clear guidelines that can be effectively communicated to all PLN employees. Strong governance is critical in sustaining PLN's performance, driving long-term value development, and coordinating stakeholder interests, as the company's BOD recognizes. PLN's entire business process is run collaboratively, with each division contributing to integrating an overarching framework into PLN's operations. Currently, nature management is included within the environmental management framework.

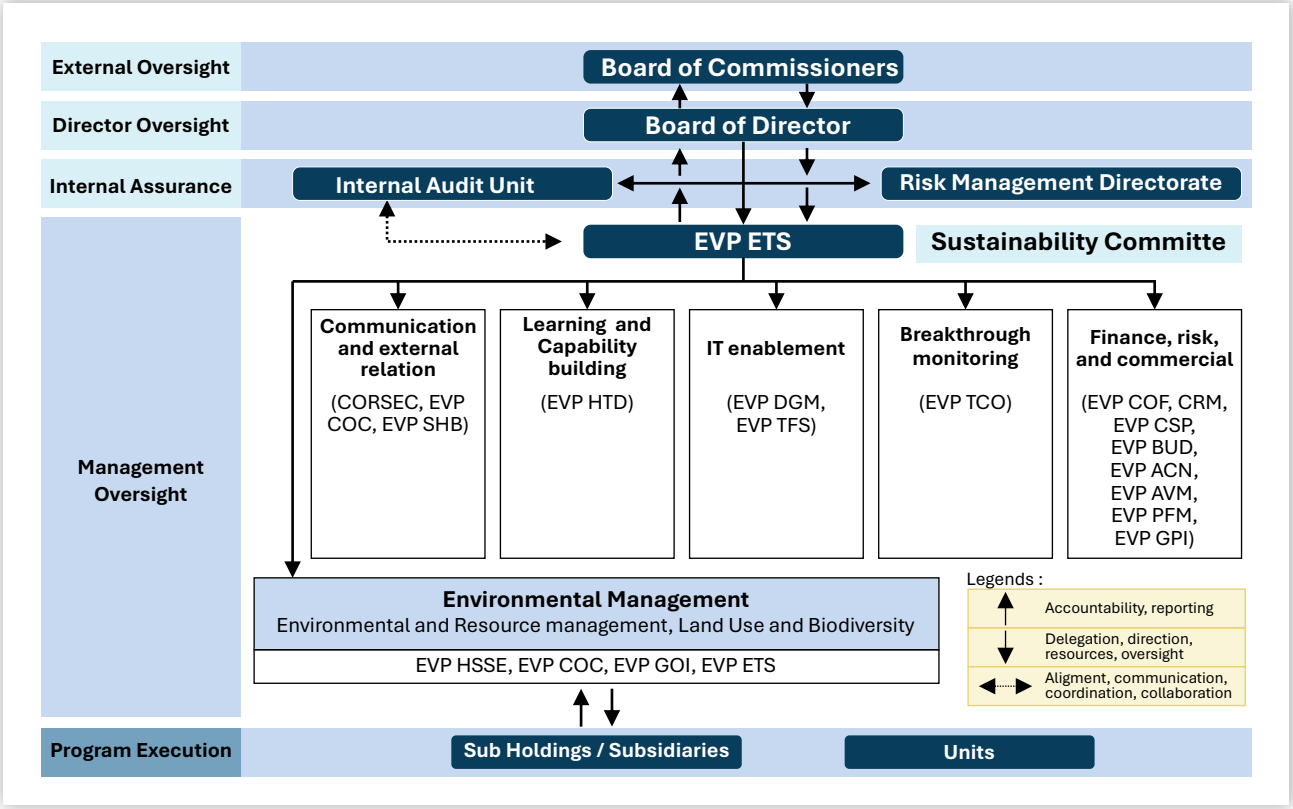


Figure 2: PLN's environmental management framework

As shown in Figure 2, the responsibility of each division in the nature governance framework is as follows:

a. Internal Audit and Risk Management Unit Responsibilities

The PLN Group's business entities, including the holding and subholding companies, are part of PLN's robust risk management system. The BOD receives direct reports from the Internal Audit and Risk Management Directorate. Recommendations from the Risk Management Directorate are incorporated into consultation processes for decisions about sustainability, particularly nature management. The Internal Audit Unit audits the sustainability implementations carried out by all divisions and business units as a check-and-balance measure.

b. Sustainability Committee Responsibilities

PLN's Sustainability Committee oversees establishing, monitoring, and evaluating the company's sustainability policies and practices in addressing ESG issues. The committee comprises members from various work units, and its organizational structure can be seen in more detail in the ESG Report reference with IFRS S1. It operates under the supervision of the BOD and is led by the EVP of the ETS Division. To enhance the effectiveness of the primary workstreams, the committee has instituted facilitative workstreams. Specifically, the communication and external relations workstream ensures transparent communication with stakeholders. The learning and capability-building workstream aids in equipping employees with the necessary skills for implementing their relevant initiatives. In addition, IT enablement provides technological support and breakthrough monitoring to track progress on key initiatives. For finance, risk, and commercial workstreams, financial support is provided while integrating sustainability into the financial planning and risk management processes.

c. Environmental Management Responsibility

Nature-related responsibilities at PLN are primarily managed by the EVP of ETS Divison, supported by various divisions, including HSSE, COC, GOI, and unit-level management, under the supervision of a chairman appointed by an authorized director. Based on PLN Internal Board Direction No. 0022.P/DIR/2023, nature-related roles and responsibilities are divided into the following divisions:

- **EVP ETS** ensures that nature programs align with PLN's NZE goals, implements ESG and Environmental and social safeguard policies, and implements mitigation programs (including collaboration with CSR programs) to prepare for impacts and energy transition that cover all aspects of ESG and ensure the implementation of an equitable energy transition.
- **EVP HSSE** is responsible for developing policies, guidelines, and management strategies, ensuring management follows organizational targets and objectives, and for aligning the plan, implementation, monitoring, and evaluation of business processes within the division with corporate policies related to ESG.
- **EVP COC** ensures that the development of ISO-based social and environmental responsibility strategies and policies is aligned with SDGs and that the planning, implementation, monitoring, and evaluation of all business processes in the division are aligned with ESG-related corporate policies.
- **EVP GOI** ensures the operation, maintenance, and management of generation assets of Holding, Subsidiaries, and IPPs follow the asset management strategies and policies to achieve optimal generation operational performance with due regard to security, health, safety, security, and environmental aspects.
- A chairperson manages each subholding and subsidiary at the unit level, and is appointed by the authorized Leader or Director of the subholding or subsidiary. The ETS Division monitors the implementation of nature management, which is part of the sustainability performance of subholdings and subsidiaries

NATURE RELATED EXPERIENCE

Green Leadership

Under the leadership of CEO Darmawan Prasodjo, PLN has demonstrated an exceptional commitment to environmental management, achieving the best performance in its history. The company was honored with the Green Leadership Award at the 2023 Environmental PROPER and Regional Environmental Management Performance Awards, organized by Indonesia's Ministry of Environment and Forestry. This achievement reflects PLN's outstanding commitment to environmental stewardship, surpassing its previous record by securing 20 Gold Proper awards, an increase from 15 in the prior year. The Gold PROPER category is the highest recognition awarded to companies that excel in and go beyond environmental management while committing to sustainable community development.

Sustainability Awards

At the Indonesia Green Awards 2023, PLN received eleven prestigious honors, including the top prize, the Best Indonesia Green Award, together with nine other awards recognizing its initiatives in nature and environmental conservation. These awards, presented by the La Tofi School of Social Responsibility, were given in recognition of PLN's outstanding achievements in driving breakthroughs and innovations in environmental management across its areas of operation. Biodiversity-related awards were given to PLN in the following categories:

- Nature Conservation Program Development for the Kampung Jenggalu Kito Mangrove Conservation Area Development Program;
- Energy Conservation Technology for the Yarwaser Raja Ampat Micro-Solar Power Plant and Micro-Storage Program "SuperSUN";
- The category of biodiversity through the Samalona Island coral reef transplantation program;
- The category of digitalizing nature conservation through the digitalization of CSR programs;

In the same year, in addition to receiving the La Tofi School award, PLN also received several other prestigious green awards, including:

- BUMN (SOE) Category for Action, for the Alternative Category for Sustainability, awarded to PLN Gas & Geothermal at the TrenAsia ESG Award 2023;
- Green Initiative Awards 2023, in the Energy/Mining category, organized by Katadata;
- Best ESG (Environmental, Social, and Governance) Campaign in the Energy Sector, awarded by CNBC Indonesia.

These award demonstrate PLN's dedication to organizing operational business and power generation that is safe, clean, efficient, and beneficial to the surrounding communities. PLN's current commitment is to provide power and safeguard the environment, one of which is to convert ecologically friendly plants to achieve the energy transition to Net-Zero Emission in 2060.

Sustainability War Room (SWR)

SWR is a strategic initiative by PLN aimed at accelerating efforts to support the energy transition, with the goal of meeting the Nationally Determined Contributions (NDC) target for 2030 and achieving Net Zero Emissions (NZE) by 2060. It serves as a platform for the sustainability committee, hosting biweekly meetings supervised by the Board of Directors to monitor and track progress across three key workstreams: ESG, energy transition, and enablers. Discussions related to environmental and nature concerns are incorporated into the ESG workstream.

Additionally, SWR plays a crucial role in guiding PLN's Quick-Win strategy to address critical ESG issues such as carbon emissions, waste management, community relations, and resource use, ensuring that progress is monitored and targets are met within the specified timeframe.

Green Leadership

Indonesian Green Awards

Bi-weekly Sustainability War Room

Figure 3: Documentation of nature-related experience

STAKEHOLDER ENGAGEMENT

As part of PLN's commitment to biodiversity conservation and responsible nature impact management, stakeholder engagement is crucial in successfully implementing sustainable strategies. This engagement involves collaboration with regulators, environmental organizations, academics, and local communities, all of whom are vital in designing, executing, and monitoring biodiversity conservation programs.

The following table outlines the roles and contributions of key stakeholders in managing environmental impacts, specifically in maintaining biodiversity within PLN's operational areas. Through these partnerships, PLN ensures that the mitigation measures implemented to support both environmental sustainability and deliver tangible benefits to local communities.

Table 4. Stakeholder engagement in managing impact

Stakeholder	Roles
Regulator (Environmental Office, Ministry of Environment and Forestry)	As the regulator of policies, regulations, and standards governing efforts to protect biodiversity.
Environmental Organization	As a strategic partner in designing and implementing biodiversity programs
Agency/Institution/Community	Cooperation in conserving and maintaining flora and fauna
Academics	As a strategic partner in designing and implementing biodiversity programs
Employee	• Creating innovative biodiversity conservation programs • Monitoring and evaluating biodiversity conservation
Communities	In running biodiversity programs that respect local rights and wisdom and provide tangible socio-economic benefits to the community

PLN’s stakeholder engagement involves partnering with Conservation Centers, National Parks, Environmental Agencies, and other relevant local authorities to carry out biodiversity conservation and restoration programs tailored to the unique needs of each power plant. These partnerships emphasize the shared responsibility in protecting biodiversity and restoring ecosystems impacted by PLN’s activities and include:

- Optimizing the Management of Mount Halimun Salak National Park (2016-2023) through the Javan Hawk-eagle Conservation Program at GPP Mount Salak, West Java
- Cooperation Agreement No. PKS.836/T.14/TU/KUM/7/2019 No.01/SKB/060/UPJPKMJ/2019 between Mount Halimun Salak National Park and PT PLN Indonesia Power Kamojang POMU on the Strengthening the Function of Mount Halimun Salak National Park
- Cooperation between Keramasan CCPP and South Sumatra BKSDA on Strengthening the Function of the Sumatran Elephant Training Center at Padang Sugihan Wildlife Sanctuary, South Sumatra KSDA, as stated in No. PKS.730/K.12/TU/KSA/3/2021.

These engagement initiatives demonstrate PLN's commitment to fulfilling its operational objectives and to actively contributing to the protection and restoration of biodiversity. By fostering partnerships with conservation organizations and local authorities, PLN ensures that its environmental strategies are comprehensive, sustainable, and beneficial to nature and the surrounding communities. These efforts reflect PLN's long-term dedication to balancing energy production and biodiversity conservation, reinforcing its role as a responsible energy provider and environmental steward.

STRATEGY

- IDENTIFY SENSITIVE LOCATIONS
- NATURE-RELATED RISKS AND OPPORTUNITIES
- STRATEGIC DECISIONS

TNFD REPORT

Taskforce on Nature-related Financial Disclosure

IDENTIFY SENSITIVE LOCATION

Out of its 33 power plants, some were identified as being in sensitive locations with high biodiversity value, such as National Parks and KBA, habitats for endangered or endemic species. These sites are particularly vulnerable to industrial disturbances. A spatial analysis was conducted on these locations, including fossil fuel, hydropower, and geothermal plants, overlaying them with essential biodiversity areas. Three tools were used to identify sensitive locations and analyze our nature-related risks for PLN:

The WWF Biodiversity Risk Filter

This tool is designed to assist in understanding and addressing biodiversity risks to enhance resilience. We can gain valuable insights into how existing developments and projects may impact biodiversity by utilizing PLN production areas and important spatial data, such as ecosystem service maps. By identifying potential risks in our operations, supply chains, and investments, we can effectively target our efforts toward managing these risks. This tool also provides a landscape risk score, representing a specific aspect of biodiversity risk derived from assessing biodiversity indicators and the industry's impact and dependence on these indicators at a specific location.

iBAT

This tool provides effective up-to-date information on biodiversity from key global databases to identify biodiversity hotspots, protected areas, and threatened species within a specific project area based on the IUCN Red List Categories and Criteria. IUCN typically reassesses the Red List category for each species every five to ten years. This periodic reevaluation helps us monitor changes in species' statuses over time. Species can fluctuate-increasing, decreasing, or staying the same-due to habitat loss, climate change, and conservation efforts. Therefore, adjusting our strategies based on these observed changes is crucial. It aims to ensure that biodiversity values are considered early in decision-making to avoid or mitigate negative impacts on ecosystems and species.

ArcGIS

This spatial analysis tool overlays important biodiversity areas such as KBA and protected areas. To analyze and determine the distribution and percentage of overlap with These Areas, data from iBAT is obtained and overlaid with PLN's generator areas using ArcGIS

The following figures are generated from iBAT and ArcGIS to demonstrate the distribution and overlap with PLN's generator areas (Figure 4-7)

Power Plants Distribution in Sumtera Island

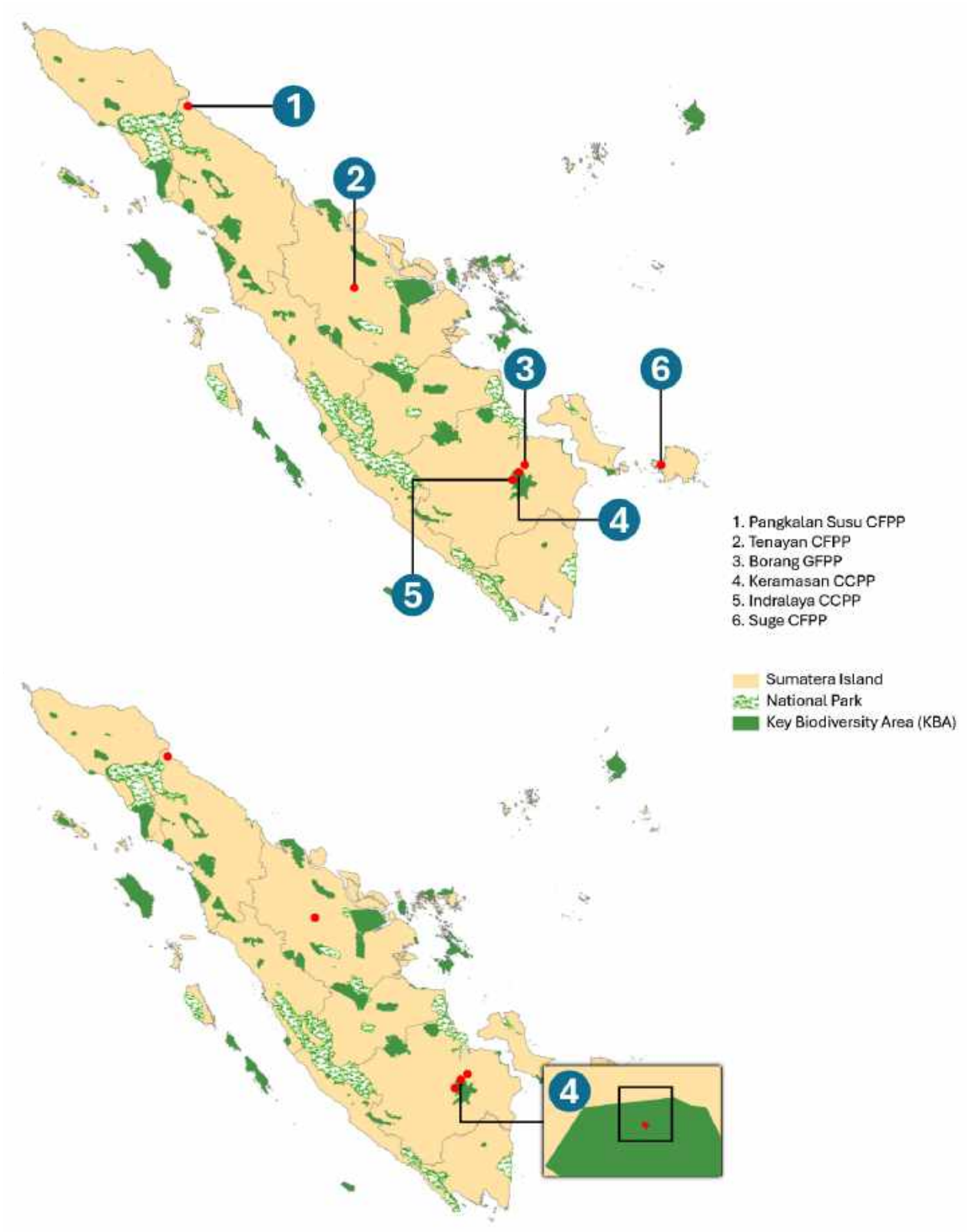
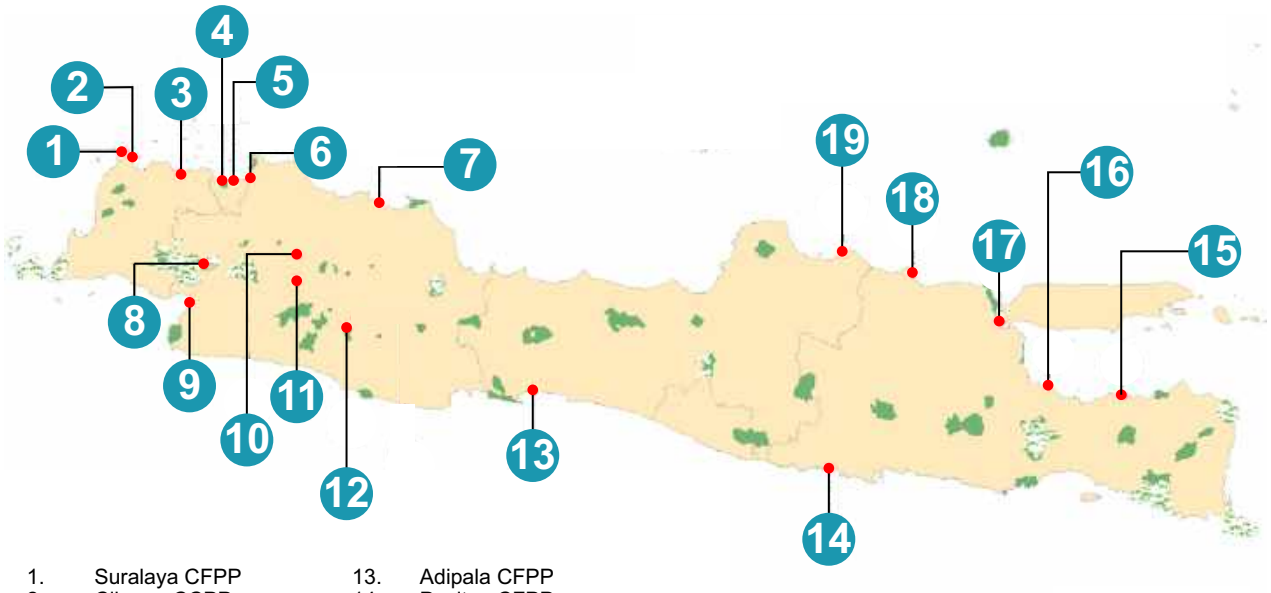


Figure 4: Power plants distribution in Sumatra Island and overlaid area with National Parks and KBA

Power Plants Distribution in Java Island



1. Suralaya CFPP
2. Cilegon CCPP
3. Lontar CFPP
4. Muara Karang CCPP
5. Priok CCPP
6. Muara Tawar
7. Indramayu
8. Gunung Salak GPP
9. Palabuan Ratu CFPP
10. Cirata HPP
11. Saguling HPP
12. Kamojang GPP
13. Adipala CFPP
14. Pacitan CFPP
15. Paiton CFPP
16. Grati CCPP
17. Gresik GFPP
18. Tanjung Awar-awar CFPP
19. Rembang CFPP

Java Island
National Park
Key Biodiversity Area (KBA)

Figure 5: Power plants distribution in Java Island and overlaid area with National Parks and KBA

Power Plants Distribution in Bali Island

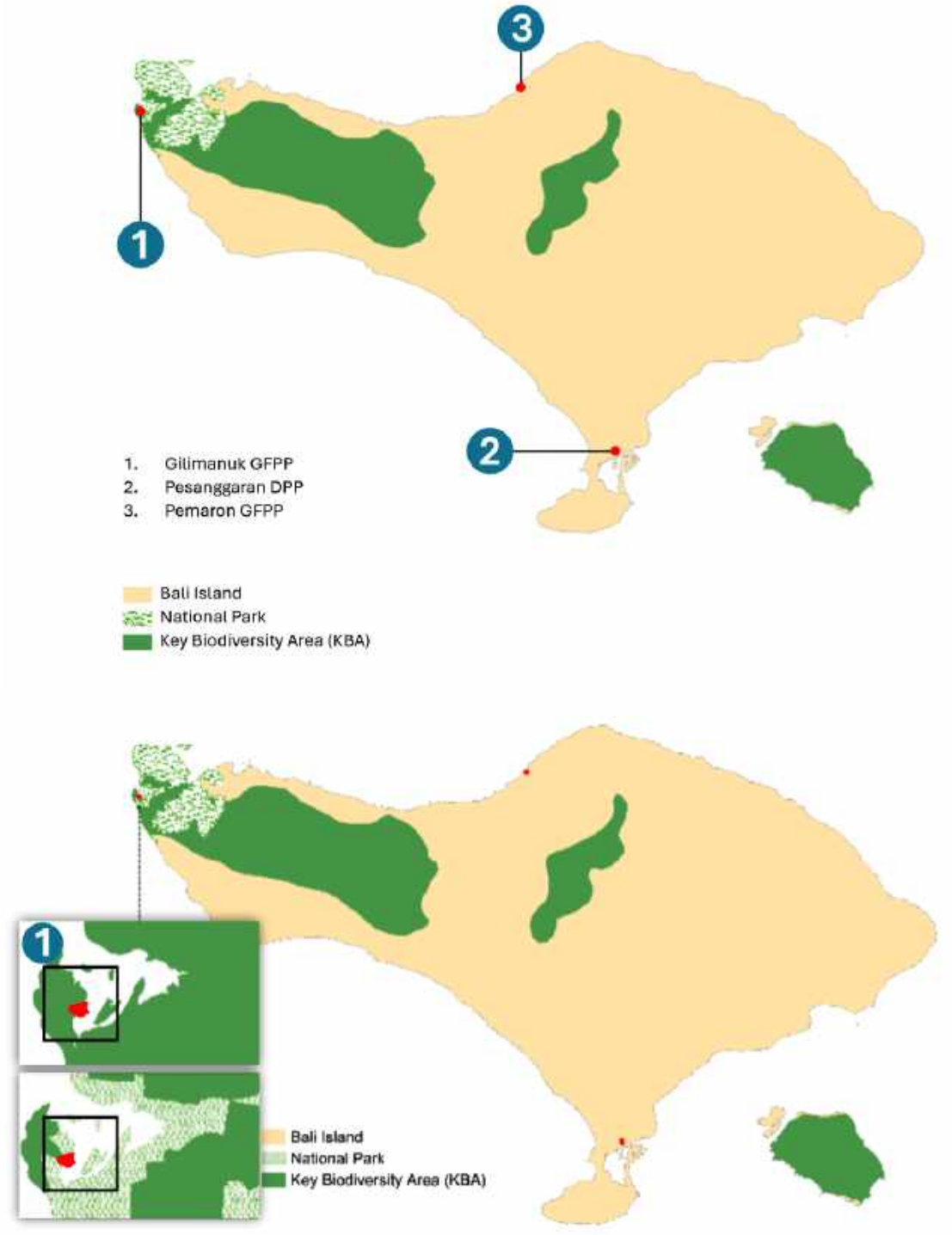


Figure 6: Power plants distribution in Bali Island and overlaid area with National Parks and KBA

Power Plants Distribution in Sulawesi Island

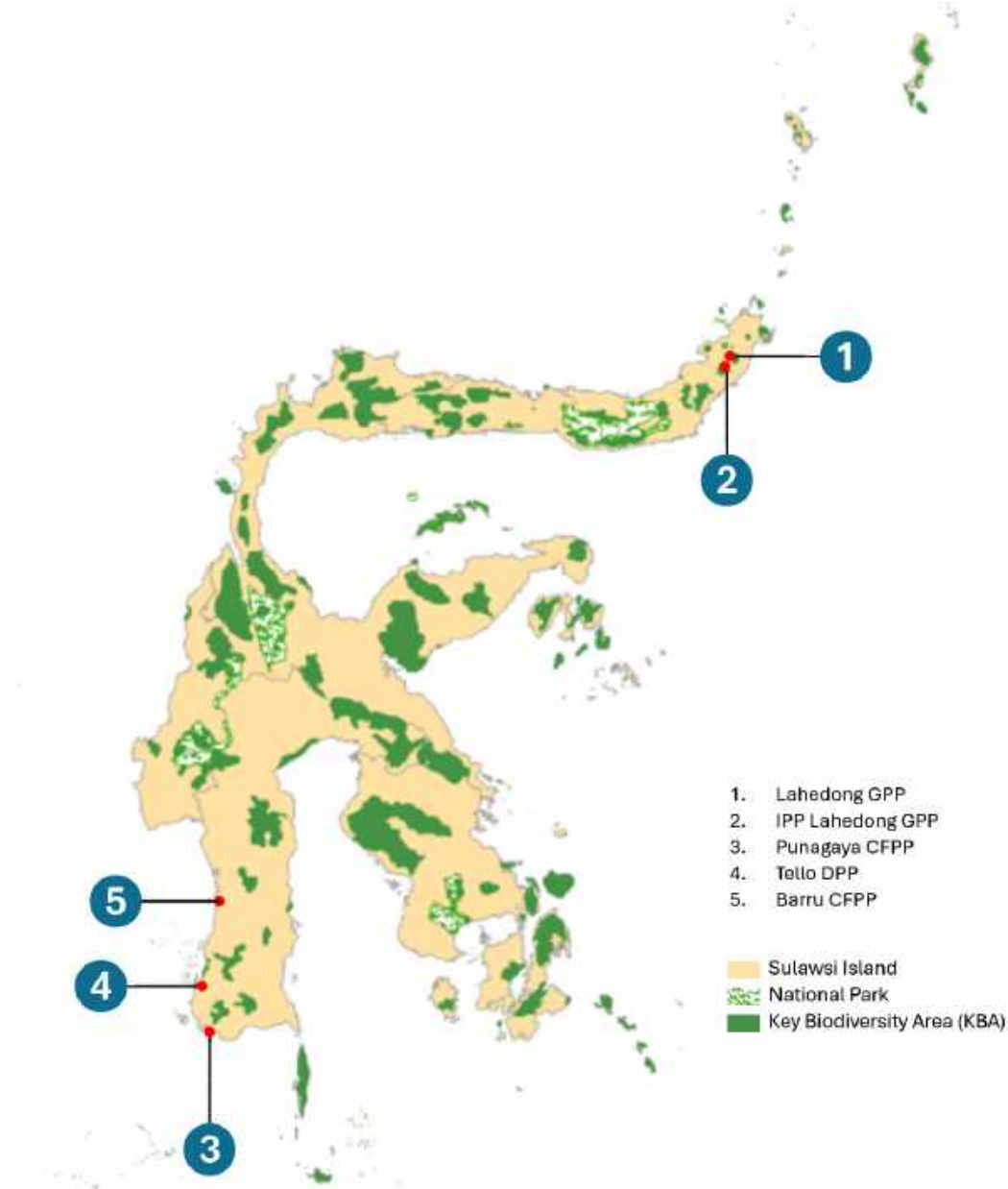


Figure 7: Power plants distribution in Sulawesi Island

Specifically, the distribution of power plants on the island of Sulawesi is not within areas of high biodiversity value. Instead, all power plants tend to be in areas of lower biodiversity value, such as coastal areas or modified open land, to ensure that energy development does not damage the precious natural environment.

The locations of these power plants have been overlaid with National Parks and KBA and then divided into different regions. Four of the 33 power plants in Indonesia are situated in areas of high biodiversity importance, as shown in Table 5. We conducted an overlay analysis to determine the overlap between the locations of these power plants and the areas with high biodiversity value.

Table 5. Power plants and areas of high biodiversity value

Power Plant	Province	High Biodiversity Value
Mount Salak GPP	West Java	National Park
Muara Karang CCPP	DKI Jakarta	Key Biodiversity Area
Gilimanuk GFPP	Bali	National Park
		Key Biodiversity Area
Keramasan CCPP	South Sumatra	Key Biodiversity Area

The four power plant sites are generally located in areas of high biodiversity value. The construction of GPP within national parks, such as the one in Mount Salak, is primarily due to the high geothermal potential these locations offer. Areas within national parks often contain active geothermal fields and volcanic activity that creates ideal conditions for geothermal energy generation. In these settings, geothermal resources are abundant and stable, making the sites advantageous for sustainable energy sources. Additionally, the strategic location of GFPP/CCPP in these areas is often due to considerations of resource accessibility, infrastructure, and proximity to energy resources and electricity distribution networks. In response to these conditions, PLN prioritizes nature risk management by implementing various action and mitigation strategies and operational practices to minimize negative impacts on sensitive ecosystems. This approach balances development and nature protection, ensuring sustainable management practices and compliance with strict environmental regulations.

NATURE-RELATED RISK AND OPPORTUNITIES

A comprehensive analysis of risks and opportunities related to strategic locations has been conducted. The results of the risk analysis are presented quantitatively as percentages, while the opportunity analysis is qualitative. This analysis includes a thorough examination of risks for four power plants: Mount Salak GPP, Gilimanuk GFPP, Keramasan CCPP, and Muara Karang CCPP, covering both physical and reputational risks. Given the critical importance and impact of these plants, the WWF Biodiversity Risk Filter was used to assess the types of risks, resulting in the following scores.

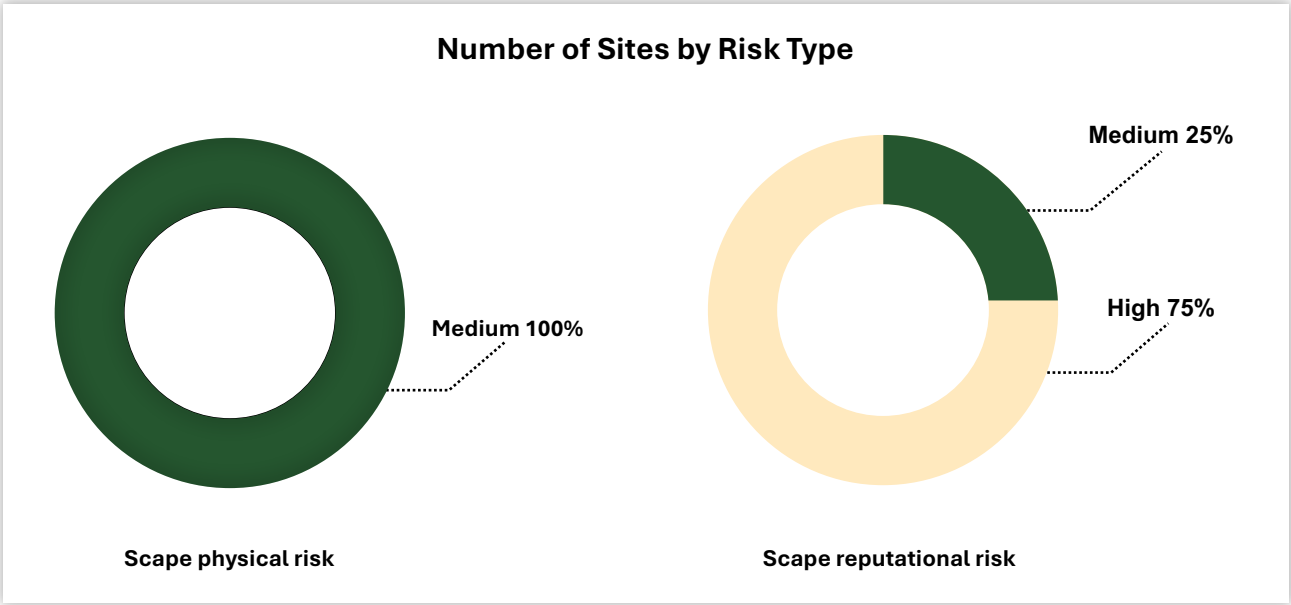


Figure 8: Scape physical and reputational risk

Managing physical and reputational risks involves identifying, addressing, and mitigating potential threats that could harm PLN's operations, assets, and public image. Physical risks encompass various factors, including provisioning services, regulating and supporting services, mitigating services, cultural services, and pressures on biodiversity. Reputational risks typically arise from environmental factors, such as the presence of power plants in conservation areas, which can trigger social conflicts and impact the company's reputation. These risks are managed through robust corporate governance, transparency, effective communication strategies, and proactive stakeholder engagement. Generally, a medium-high risk score indicates that the evaluated project or area has a medium to high level of physical risk, requiring adequate mitigation measures to reduce potential negative impacts. By addressing physical and reputational risks, PLN can protect its operations, maintain public trust, and ensure long-term sustainability. The scores for each risk category are detailed in the graph below.

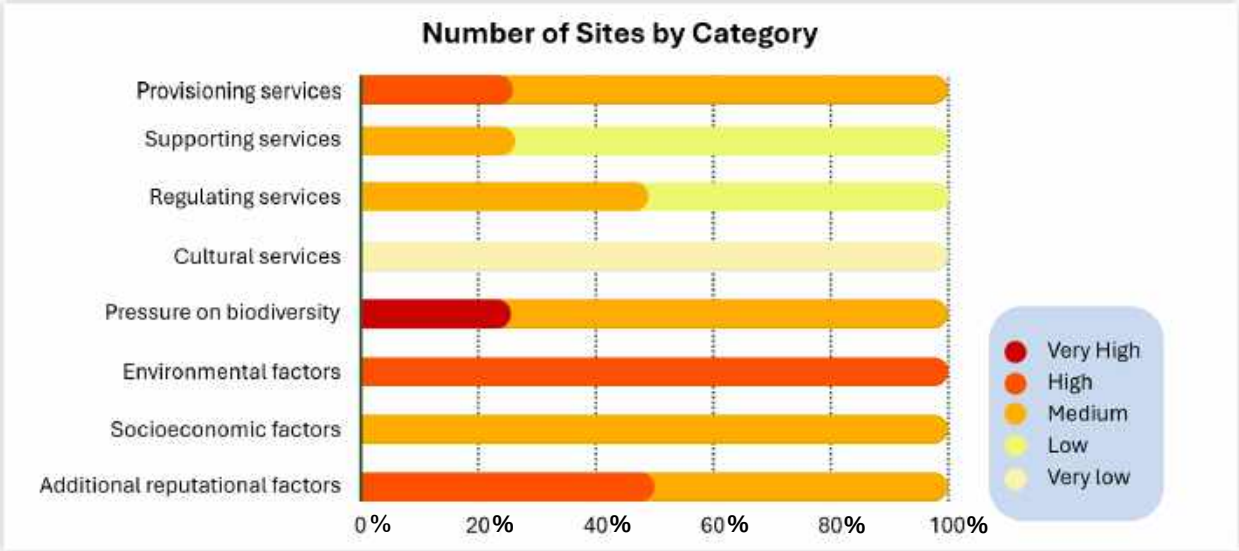


Figure 9: Top risk category

Given the high and very high-risk levels associated with these factors, special attention must be directed towards provisioning services, biodiversity pressures, environmental factors, and reputational risks. The table below provides key indicators within each risk category, emphasizing physical and reputational risks. These indicators show the potential challenges for PLN and highlight opportunities for developing proactive strategies to achieve future sustainability targets.

Table 6. Indicators of nature-related physical and reputational risk

Risk Type	Risk Category	Indicator
PHYSICAL	Provisioning Services	• Water Availability • Forest Productivity and Distance to Markets
	Pressures on Biodiversity	• Land, Freshwater and Sea Use Change • Tree Cover Loss • Pollution
REPUTATIONAL	Environmental Factors	• Protected/Conserved Areas/KBA • Ecosystem Condition • Range Rarity
	Socio-economic Factors	• Indigenous peoples • Local communities • Resource scarcity: Food, water, air • Labor/human rights • Financial inequality
	Additional Reputational Factor	• Media scrutiny • Political situation • Sites of international interest • Risk preparation

Table 7. Nature-related opportunity based on risk category

Risk Category	Nature-Related Opportunity	Long-Term Strategy
Provisioning Services	**Water Availability** Opportunity to invest in water-efficient technologies to reduce dependency on local water sources.	Develop and implement water management programs at power plant sites to minimize water usage and protect local water bodies.
	Forest Productivity and Distance to Markets Potential to enhance reforestation efforts.	Invest in reforestation and afforestation programs to improve local biodiversity and support ecosystem services.
Pressures on Biodiversity	**Land, Freshwater, and Sea Use Change** Opportunity to enhance land-use planning and minimize habitat loss.	Adopt sustainable land-use practices and collaborate with local stakeholders for better land and water resource management.
	Tree Cover Loss Potential to engage in forest conservation and carbon offset programs.	Expand efforts in reforestation and tree planting programs, aligning with national and global climate action goals.
	Pollution Opportunity to reduce pollution through innovation and cleaner energy sources.	Invest in green energy technologies and adopt the best waste and pollution management practices across all operational sites.
Environmental Factors	**Protected/Conserved Areas &KBA** Potential to partner with conservation organizations.	Collaborate with local and international conservation organizations to protect and manage critical biodiversity areas.
	Ecosystem Condition Potential to improve ecosystem health through biodiversity restoration.	Invest in ecosystem restoration programs in areas impacted by operations, enhancing biodiversity and ensuring sustainability.
	Range Rarity Potential to prioritize conservation of endemic species and establish specific management programs that ensure protection of species and their habitats.	• Habitat protection and restoration • Collaborative conservation efforts • Ecological monitoring
Socioeconomic Factors	**Indigenous Peoples, Resources Scarcity, Human Rights, Financial Inequality** Opportunity to collaborate with indigenous peoples through sustainable nature-based programs.	Engage in community development initiatives and ensure fair resource distribution, respecting indigenous rights and cultural values.
Additional Reputational Factors	**Media Scrutiny & Risk Preparation** Opportunity to strengthen corporate resilience by improving environmental risk management.	Develop comprehensive environmental risk management frameworks to mitigate reputational risks and prepare for future regulatory changes.
	Media Scrutiny & Political Situation Potential to enhance transparency and build positive reputation.	Engage in transparent reporting and participate in international conservation programs to build a positive environmental image.

STRATEGIC DECISIONS

PLN instigates strategic decisions to avoid and minimize negative impacts on nature through nature programs and stakeholder engagement initiatives. For stakeholder engagement, these efforts align with the commitments outlined in the Governance chapter.

Nature Programs

PLN recognizes the importance of integrating biodiversity conservation into its operational framework, particularly in areas of high biodiversity value. Each power plant implements nature programs designed to balance energy production with ecosystem preservation to achieve this. These programs are developed based on comprehensive EIA, which allows PLN to anticipate and mitigate potential risks to biodiversity before initiating any projects. By aligning one of the national targets on IBSAP, PLN ensures that its nature-related programs protect biodiversity and contribute to broader national and global sustainability targets. Through focused conservation efforts in biodiversity conservation areas, PLN demonstrates its commitment to minimizing environmental impacts while supporting long-term biodiversity and ecosystem resilience. Examples of nature programs that are routinely carried out by power plants located in high biodiversity areas include:

Umbrella Program

PLN developed conservation areas and protecting endemic species at its operational sites. At Mount Salak Geothermal Power Plant (GPP), which utilizes renewable geothermal energy, several protected species have been identified through biodiversity risk screening. The site actively engages in biodiversity conservation, including educational initiatives at the study center of *Javan Hawk-Eagle* and has established a breeding center for this endangered species as part of the Umbrella Program. The Javan Hawk-Eagle, classified as "Endangered" by the IUCN Red List, plays a crucial role as an umbrella species, aiding the protection of numerous other species and their habitats.

Figure 10: Javan Hawk-Eagle nest building

Figure 11: Study centre of Javan Hawk-Eagle

Creating artificial nests for the Javan Hawk-Eagle is an innovative effort to support the species' breeding and conservation. The initiative involves constructing eagle nests with sizes and materials that mimic those found in nature, using dry twigs, dry leaves, and green leaves. An essential improvement in this innovation is the use of rattan rods as the main structure of the nest base, chosen for their sturdy structure and ease of shaping. Other materials include palm fibers, dry pine leaves, fresh rasamala tree leaves, and twigs. Additionally, iron supports are incorporated to ensure the nests are more stable and less prone to falling. CCTV cameras were installed to further enhance the breeding program's success, allowing constant monitoring of the eagles' development without disturbing their habitat. As an apex predator, the Javan Hawk-Eagle requires high-quality forest ecosystems for successful breeding. This conservation program enables visitors to observe the eagles' development and behavior until they are ready for release back into their natural habitat. This has significantly contributed to the ongoing monitored release program, which includes progress tracking of the Javan Hawk-Eagle and other eagle species.

Table 8. Monitoring and conservation efforts for the Javan Hawk-Eagle

Protected fauna	IUCN Red List status	Year	Monitoring and release of
Javan Hawk-Eagle (*Nisaetus bartelsi*)	Endangered	2021	9 individuals
		2022	8 individuals
		2023	1 individual
Changeable Hawk-Eagle (*Nisaetus cirrhatus*)	Least Concern	2021	8 individuals
		2022	7 individuals
		2023	0 individual
Crested Serpent-Eagle (*Spilornis cheela*)	Least Concern	2021	3 individuals
		2022	1 individual
		2023	1 individual
Black-Winged Kite (*Elanus Caeruleus*)	Least Concern	2021	1 individual
		2022	3 individuals
		2023	0 individual

The table highlights PLN's ongoing monitoring and conservation efforts for various protected raptor species, including the Javan Hawk-Eagle, within the Mount Halimun Salak National Park. Javan Hawk-Eagles are consistently monitored, and several individuals have been successfully released back into their natural habitat from 2021 to 2023. In 2021, nine individuals were released, followed by eight in 2022 and one in 2023.

These efforts reflect PLN's commitment to preserving biodiversity and ensuring the long-term survival of these iconic species. While the number of releases may fluctuate, it is important to recognize that the program prioritizes the health and readiness of each individual eagle before release, ensuring that they are fully capable of thriving in the wild. The reduced number in 2023 indicates a careful and focused approach, prioritizing the quality of conservation efforts over quantity, as part of a sustainable and responsible wildlife management strategy.

Other raptor species, such as the Changeable Hawk-Eagle, Crested Serpent-Eagle, and Black-Winged Kite, have also been consistently monitored, with successful releases contributing to overall regional biodiversity conservation. These ongoing initiatives underscore PLN's dedication to integrating conservation into its operational framework and supporting Indonesia's rich biodiversity.

Sumatran Elephant In-situ Conservation at Padang Sugihan Training Centre

In 2021, the Keramasan CFPP, in collaboration with BKSDA South Sumatra, launched a conservation program for the Sumatran Elephant (*Elephas maximus sumatrensis*) at the Padang Sugihan Elephant Training Center. This initiative focuses on multiple activities to monitor and safeguard the health and welfare of this species, currently classified as "Endangered" on the IUCN Red List.

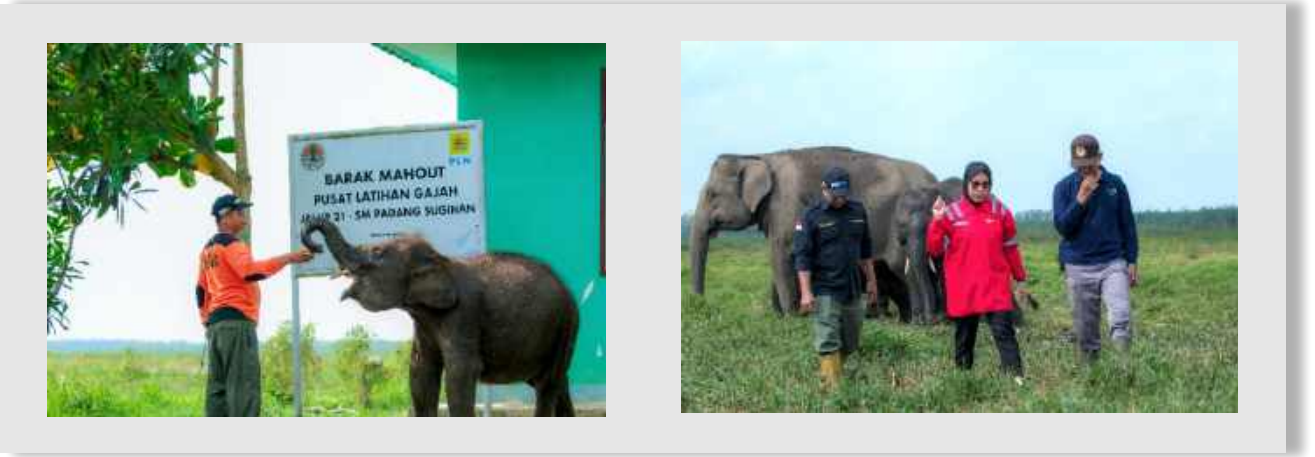


Figure 12: Elephant In-situ Conservation at Padang Sugihan Training Centre

The current population of Sumatran Elephants is under severe pressure due to habitat loss and human-wildlife conflict, making this conservation initiative crucial for survival. The program's key activities include:

- Health Monitoring of Elephants: Regular health assessments are conducted to monitor the Elephants' well-being. This includes estimating their body weight by measuring their girth and shoulder height and providing crucial information about their physical condition.
- Behavioral Monitoring Using Camera Traps: Camera traps and Inmarsat Satellite Technology are used to observe Elephants' movement patterns over time, promoting the coexistence of human activities with the Elephant's natural habitat, particularly in the Sugihan habitat pocket, one of the largest Sumatran Elephant habitats in South Sumatra. This technology is also crucial for monitoring the growth and development of newborn Elephants, ensuring the next generation is well cared for.
- FGD and Field Visits: Regular field visits and FGDs are conducted to directly observe the Elephants and assess the effectiveness of conservation efforts. This allows for timely interventions and ensures the program aligns with local ecological needs and broader conservation goals.

Table 9. Monitoring and conservation efforts for the Sumatran Elephants

Protected fauna	IUCN Red List status	Year	Monitoring and release of
Sumatran Elephants (*Elephas maximus sumatrensis*)	Endangered	2021	30 individuals
		2022	28 individuals
		2023	28 individuals

Through these initiatives, the program helps safeguard the Sumatran elephant population and fosters collaboration between stakeholders in the region, including conservation agencies and local communities. This comprehensive approach demonstrates PLN's commitment to wildlife conservation while ensuring that its operational activities contribute to environmental sustainability.

Conservation of Bali Myna (*Leucopsar rothchildi*)

The iBAT analysis of Bali power plants highlighted the Bali Myna's (*Leucopsar rothschildi*) status as "Critically Endangered" based on IUCN Red List and as an endemic species with a declining population. To support its conservation, Gilimanuk GFPP collaborates with West Bali National Park to protect and increase the Bali Myna population through a captive breeding program. Gilimanuk GFPP has developed facilities, including three aviaries: a 10x10x12-meter cage in the park, a 3x3x4-meter cage for broodstock, and a 3x3x3-meter cage for nestling at the Gilimanuk GFPP. The program aims to release the bred Bali Mynas into the wild to restore their population.

Table 10. Monitoring and conservation efforts for the Bali Myna

Protected Fauna	IUCN Red List Status	Year	Conservation Efforts
Bali Myna (*Leucopsar rothschildi*)	Critical Endangered	2021	Adding conservation of up to 804 individuals and improving land of endemic fauna ecosystem areas to increase the number of Bali Myna
		2022	Adding conservation and release to 975 individuals
		2023	Adding conservation and release to 703 individuals

These conservation actions demonstrate PLN's dedication to increasing the Bali Myna population, improving ecosystem conditions, and contributing to the overall goal of protecting endangered species. The year-over-year focus on adding and releasing more birds reflects the PLN's proactive biodiversity conservation approach and alignment with national and global targets. Despite the challenges that come with species conservation, PLN remains committed to ensuring the survival and recovery of this iconic bird species.

Stakeholder Engagement Program

In line with PLN's commitment to sustainable development and biodiversity stewardship, the stakeholder engagement program is critical in fostering collaboration with local communities, regulators, and various institutions. This program ensures that PLN's operations align with environmental conservation goals while empowering local stakeholders through education and capacity-building initiatives. By involving communities directly in conservation efforts, particularly in areas surrounding sensitive ecosystems such as national parks and high biodiversity value area, the Stakeholder Engagement Program underscores PLN's dedication to minimizing environmental impact and promoting sustainable practices, which is designed to raise awareness and enhancing community involvement to protect and preserve local ecosystems. Through continuous collaboration with stakeholders, PLN ensures that its sustainability strategies contribute to operational success and support broader nature and social outcomes.

Mount Salak GPP

Figure 13: Stakeholder engagement activities at Mount Salak GPP

One of the key activities involving the local community is the Forest Security Socialization program. This initiative aims to raise community awareness about the importance of forest sustainability and enhance their capacity to help maintain forest security, particularly in Mount Halimun Salak National Park and the surrounding areas. The program is specifically designed to protect and preserve the unique ecosystems within the national park. By actively engaging the local community and improving their awareness, these areas can be better protected from threats such as illegal activities and environmental degradation. The materials shared with the communities during the socialization activities include techniques for reforestation, forest fire monitoring, management of forest products for timber and non-timber, development of sustainable forest products and efforts to maintain biodiversity.

Keramasan CCPP

The Green Barrier Program is a conservation initiative focused on rare and endangered plant species with high economic value. Conducted in the Keramasan CCPP conservation area, the program collaborates with Sriwijaya University as a research partner to promote sustainable agriculture and cultivation practices. Additionally, the program is extended to "Sahabat Alam's" partner communities, involving stages from seedling development, sustainable cultivation training, and processing derivative products as part of a community empowerment effort. This approach empowers communities to conserve endangered plants while actively deriving economic benefits, fostering environmental preservation and community development.

Figure 14: "Green Barrier" engagement stakeholder and biodiversity program

The program targets three key plant species for conservation, Aquilaria malaccensis, Santalum album, and Agathis dammara, listed as “Vulnerable” and “Endangered” species based on IUCN Red List. The selection of vegetation areas and vegetation density within Keramasan CCPP was strategically determined to support the conservation efforts. In addition to focusing on the conservation of threatened species, the program also promotes the cultivation of economically beneficial trees for local communities, such as *Nephelium sp.*, *Pometia pinnata,* and *Aleurites moluccanus*, which provide fruits and raw materials that can be utilized directly by the local communities.

Gilimanuk GFPP

The empowerment initiatives at Gilimanuk GFPP demonstrate a commitment to biodiversity conservation and environmental sustainability, with a focus on innovative waste management and the protection of endangered species. One of the standout initiatives is the Conservation of Endemic Plants to Feed Bali Starlings using Diapers Waste Planting Media or KONTAK PAKJALI Program. This program aims to reduce diaper waste by processing it into planting media for endemic plant species in West Bali National Park, particularly in areas critical for the "Critically Endangered" Bali Myna.

This program utilizes diaper waste as a substitute for traditional planting media to address food shortages for Bali Myna species reliant on local vegetation. Three local plant species, *Pongamia pinnata*, *Phyllanthus emblica*, and *Cassia fistula*, are being cultivated, chosen for their resilience in coastal environments. This program demonstrates a holistic approach to waste management and biodiversity conservation, contributing to local community empowerment through job creation and nature stewardship. By converting waste into a valuable resource for ecological conservation, the program sets a benchmark for sustainable practices that benefit the environment and society.

Muara Karang CCPP

The Eco-marine Kali Adem mangrove plantation area is located at the estuary of Ciliwung River, adjacent to the Muara Angke Nature Reserve. The area's substrate is largely influenced by tidal activity, with fine muddy soil containing plastic waste, fish processing residue, and household debris from nearby communities. Initially, this area lacked vegetation and was covered by waste deposits that gradually formed new land. Since 2011, it has been transformed into a dense secondary mangrove forest.

The Mangrove Muara Angke Community, or KOMMA, was founded by residents to protect the mangrove ecosystem and manage the area. Starting in 2009, KOMMA began planting mangroves along the Kali Adem Riverbanks. Their partnership with Muara Karang CCPP started in 2011, leading to the planting of 1000 mangrove seedlings. Over the years, the collaboration expanded to include mangrove nurseries, sustainable product development, and further planting initiatives. In 2023, the most recent effort involved planting 5000 *Rhizophora mucronata* seedlings.

Table 11. Eco-marine program activities in Kali Adem

Year	Activity	Description
2011	Initial planting	1000 mangrove seedlings planted
2012	Mangrove nursery established	A nursery for mangrove seedlings was created
2013	Sustainable product experiment	Development of product from Sonneratia alba
2014-2018	Large-scale planting	37000 mangrove seedlings planted
2023	Latest planting	5000 Rhizophora mucronata seedlings planted

Over the past few years, this initiative, driven by KOMMA in collaboration with Muara Karang CCPP, has played a pivotal role in converting degraded, waste-filled land into a thriving mangrove ecosystem. This success underscores the long-term benefits of consistent conservation efforts and community engagement. The following figure illustrates the significant changes observed between 2019 and 2024, showing the area's recovery from an initially barren state into a flourishing mangrove forest.

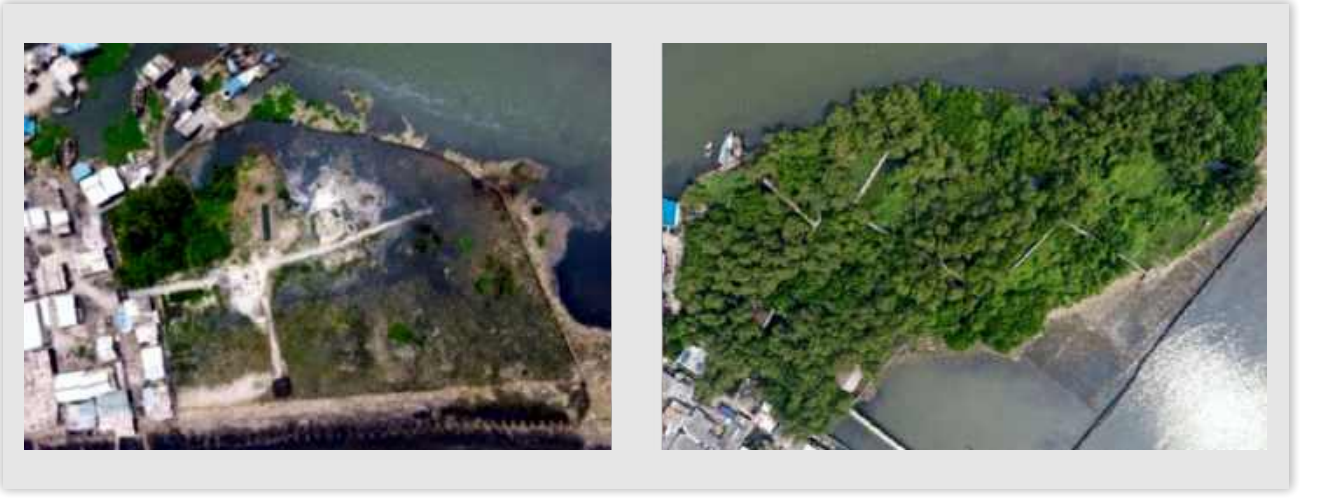


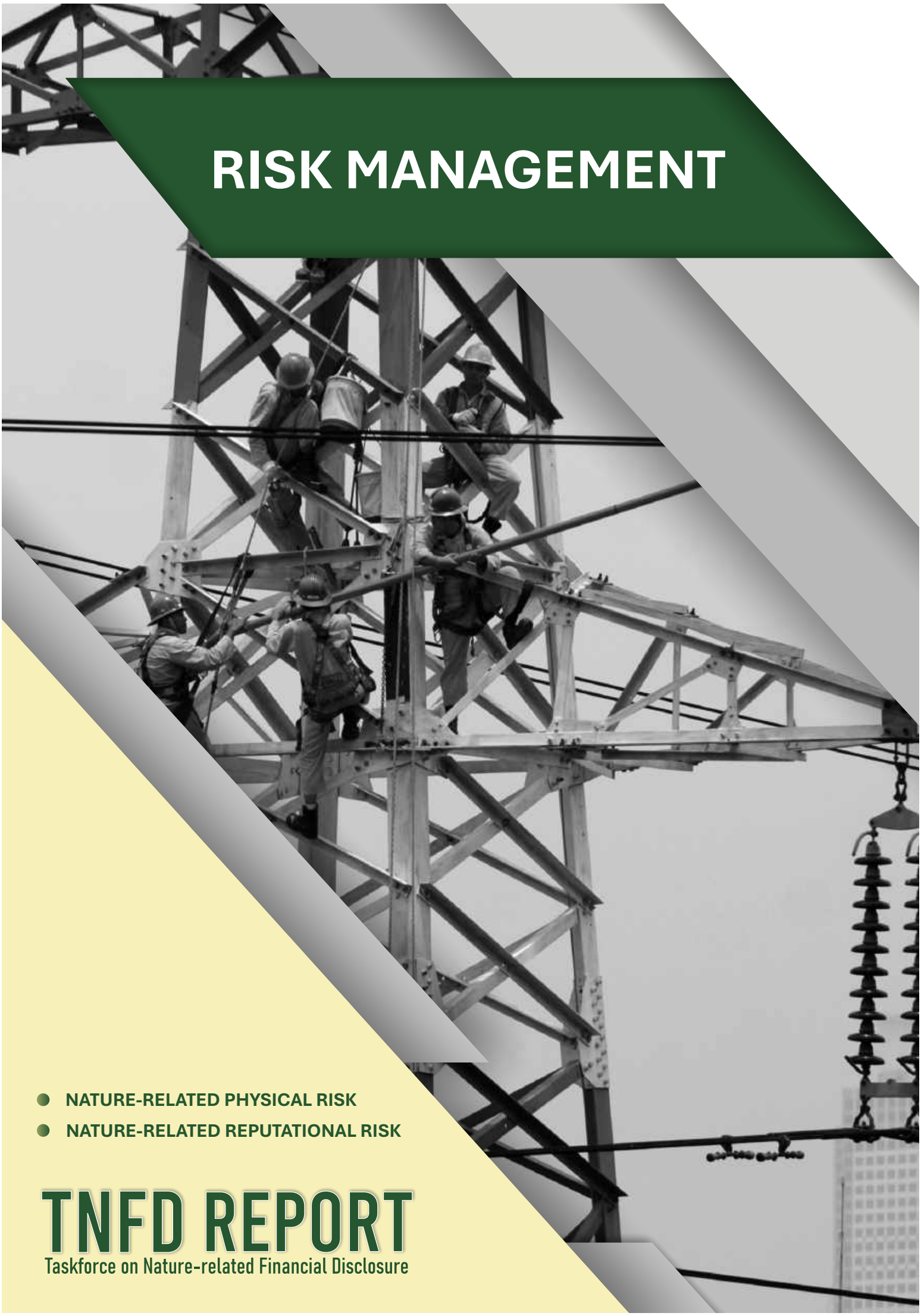
Figure 15: Condition of the area before and after eco-marine program

The comparison between 2019 and 2024 highlights the remarkable transformation achieved through the Kali Adem Mangrove Conservation Program. In 2019, the area appeared largely barren, with limited vegetation and visible waste deposits, reflecting the environmental degradation that had taken place due to human activities and tidal effects. The substrate was heavily influenced by plastic waste, fish processing residue, and household waste, making it an inhospitable environment for natural vegetation, especially mangroves.

By 2024, the area has been revitalized into a thriving secondary mangrove forest. The restoration initiative began with planting 1000 mangrove seedlings in 2011, followed by successive years of planting, culminating in the recent planting of 5000 *Rhizophora mucronata* seedlings in 2023. The result is a lush, dense mangrove forest that enhances biodiversity and acts as a critical natural barrier, protecting the coastline from abrasion, improving water quality, and providing a habitat for various species of flora and fauna.

This transformation underscores the positive impact of long-term commitment to mangrove conservation and highlights PLN's dedication to environmental sustainability. The restoration efforts have successfully turned a once-degraded area into a vital ecosystem, benefiting the local community and the surrounding environment. This success demonstrates the effectiveness of reforestation and ecosystem restoration programs when supported by strategic partnerships and consistent management efforts.

RISK MANAGEMENT



- NATURE-RELATED PHYSICAL RISK
- NATURE-RELATED REPUTATIONAL RISK

TNFD REPORT

Taskforce on Nature-related Financial Disclosure

PLN prioritizes the identification and management of nature-related risks and opportunities across its business operations, strategies, and financial planning. To meet its environmental targets, PLN employs a three-lines-of-defense strategy—comprising assurance, supervisory, and risk management functions—overseen by the Board of Directors (BOD). The Risk Management Committee, under the supervision of the Board of Commissioners (BOC), further monitors this process.

PLN's risk management framework refers to ISO 31000:2018 and is based on the BoD Regulation No. 0016 of 2023 concerning the Integrated Risk Management Strategic Policy of PLN. This regulation establishes a comprehensive process for risk identification, analysis, recording, monitoring, evaluation, and reporting, as illustrated in Figure 16. In other words, this BOD Regulations serves as a guideline for implementing Integrated Risk Management within PLN. Further details on PLN's risk management practices can be found in the 2023 ESG Performance Report.

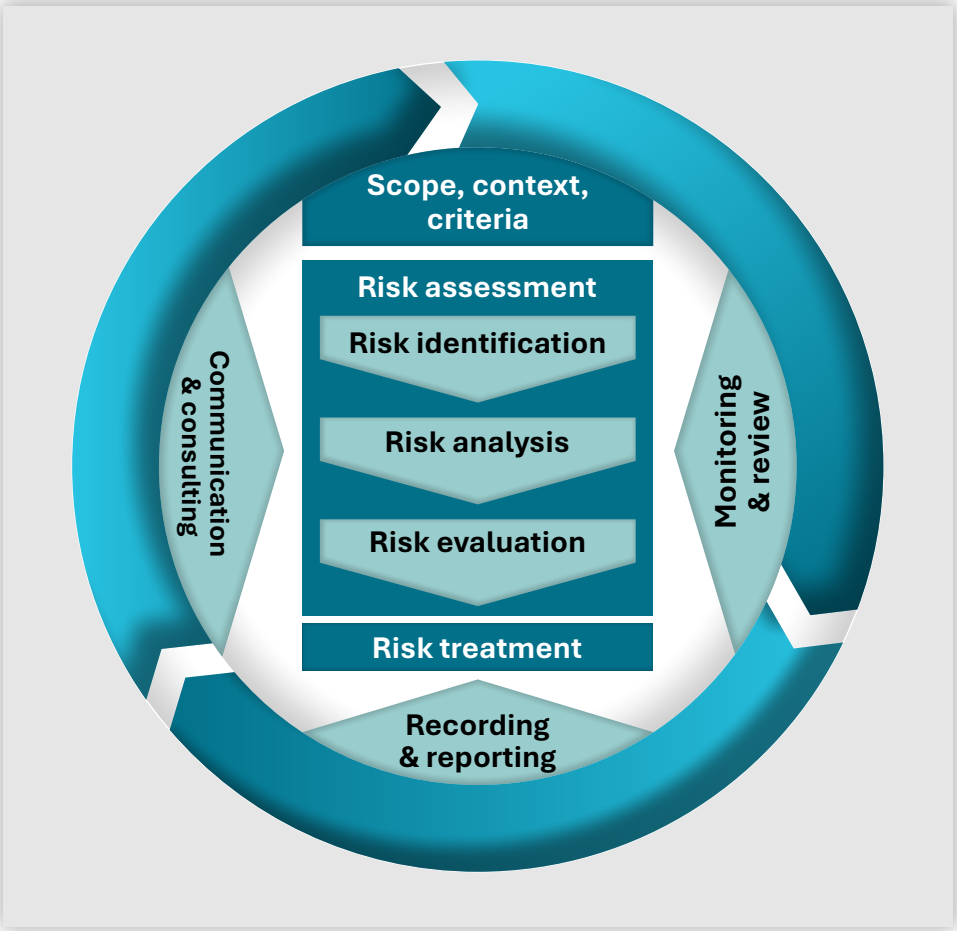


Figure 16: PLN's risk management process

Risk identification involves discovering, recognizing, and describing potential risks that could hinder PLN's objectives, and include through regular risk assessments and scenario analysis. Risk analysis is conducted on the inherent characteristics of risks associated with business processes and risks arising from specific activities or programs. PLN's risk assessment is incorporated into the risk profile, studies, and/or rankings. The risk profile outlines the key risks that could impede the achievement of PLN's long-term targets in the RUPTL (Electricity Supply Business Plan) and RJPP (Corporate Long-Term Plan), as well as PLN's short-term targets in the RKAP (Corporate Work Plan and Budget). The risk assessment identifies the risks that affect planned activities, initiatives, projects, and decision plans.

Nature is an integral part of PLN's risk assessment, which follows a structured risk management process comprising three key stages:

- Risk Identification
  This stage involves identifying all potential risks that could impact PLN's projects or operational objectives. Nature is a crucial factor in this stage, where risks such as pollution, climate change, and impacts on biodiversity are identified.

- Risk Analysis
  This stage focuses on understanding the identified risks' severity and likelihood. PLN uses relevant data and methods to assess the potential impact of these risks on projects or operations. Environmental aspects are analyzed based on potential impacts such as emissions, pollution, or ecosystem changes, along with other impacts tailored to the specific location of the project or operation.

- Risk Evaluation
  This stage determines the risk priorities based on severity and likelihood. Risks deemed unacceptable or requiring further attention are identified for mitigation or further management measures. This evaluation determines whether a risk can be accepted, needs mitigation, or requires specific actions.

To measure nature-related risks, PLN assesses both physical and reputational risks using online tools from the WWF Biodiversity Risk Filter. The risk score classification is applied consistently across all indicators, risk categories, and risk types:

- 1.0 <= x >= 1.8 Very low risk
- 1.8 < x >= 2.6 Low risk
- 2.6 < x >= 3.4 Medium risk
- 3.4 < x >= 4.2 High risk
- 4.2 < x >= 5.0 Very high risk

NATURE-RELATED PHYSICAL RISK

PLN is actively addressing a range of nature-related physical risks that could affect its operations and infrastructure as well as impact service. We thoroughly analyzed the nature-related physical risks associated with all power plants and focused on potential priority areas, particularly those with high biodiversity value. Risks such as floods, droughts, heatwaves, and rising sea levels can damage the electricity infrastructure, disrupt energy supply, and cause outages. These risks also threaten vital natural habitats like rivers, coastal areas, and forests, which are crucial for biodiversity. To address these challenges, PLN is implementing measures to strengthen infrastructure, incorporating eco-friendly technologies, and actively conserving and restoring affected ecosystems. These efforts aim to minimize the negative impacts of natural risks and protect Indonesia's essential biodiversity. Further details on physical risks and priority areas are outlined in the strategy section.

The physical risk scores and classifications presented below, derived from WWF's Biodiversity Risk Filter tools, do not fully represent PLN's overall condition. These risk assessments only cover the four power plants discussed earlier in Table 5, which are located in areas of high biodiversity value: Mount Salak GPP, Gilimanuk GFPP, Keramasan CCPP, and Muara Karang CCPP. These specific locations have been prioritized for early disclosure due to their placement in high biodiversity value areas. Therefore, the various risk scores have been integrated with PLN's action mitigation to assess the effectiveness of its strategies. This approach allows PLN to align its nature-related programs with broader risk management objectives, ensuring that sustainability measures contribute to long-term resilience and ecological preservation.

Table 12. Physical risk, impact, and mitigation

Physical Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Geothermal Power Plant (GPP)			
Water availability	The availability of water resources needed to support geothermal operations, especially during periods of high demand or environmental stress.	High	Mount Salak GPP have one initiatives is the chlorination of effluent from the wastewater treatment plant to meet the quality standards for water reuse in irrigation. This innovation was introduced because the initial water quality entering the treatment system remained high in pollutants, rendering it unsuitable for reuse. The program focuses on additional water treatment to enhance quality so that the water can be safely used for irrigation.
Forest productivity and distance to markets	Limited access to forest resources or changes in forest health impacting plant operations	Low	Mount Salak GPP implements a reforestation program to minimize the impact on forest resources and to maintain forest health. This is achieved through a nursery and native plant maintenance program, aimed at increasing forest resources for endemic plant species and monitoring forest health near operational areas.
Land use change	The development of geothermal infrastructure may lead to the alteration of land use, although efforts are made to minimize impacts on species diversity and natural habitats.	Very Low	• PLN ensures that all power plants and transmission facilities have EIA documents as a commitment to environmental management through identification, mitigation, regulatory compliance, monitoring and evaluation. • Mount Salak GPP conducts monitoring of biodiversity protection status of flora and fauna, along with assessments of biodiversity index (H'). This monitoring aims to minimize species loss in their natural habitats due to land-use changes by identifying key species at risk and implementing timely conservation actions.

Physical Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Tree cover loss	Infrastructure projects may cause habitat fragmentation, affecting certain plant species, though reforestation initiatives help counterbalance these effects.	Low	Reforestation by nursery and conservation of native plants such as *Altingia excelsa, Litsea sp., Castanopsis argentea, Schima wallichii, and Quercus sp*., among others, aims to mitigate tree cover loss. This initiative not only restores native ecosystems but also strengthens biodiversity and ecosystem resilience.
Pollution	Pollution refers to the presence of harmful substances or contaminants in the environment, leading to adverse effects on ecosystems, human health, and the overall quality of air, water, and land.	Very High	Mount Salak GPP has implemented an energy efficiency innovation by enhancing turbine performance through a redesigned cooling fan blade for Unit 1. This initiative was executed within the Cooling Tower process, and was included in the 2023 LCA scope. The redesigned Cooling Tower fan blades have successfully reduced wasted embedded energy value and contributed to an increase in power production. This improvement highlights PLN's commitment to optimizing operational efficiency while aligning with sustainability goals.
Gas Fired Power Plants (GFPP) & Combine Cycle Power Plant (CCPP)			
Water availability	The availability of water resources needed to support GFPP and CCPP operations, especially during periods of high demand or environmental stress.	High	• Water efficiency innovation and water pollutant load reduction through the use of anti-adhesion agent and biocide to improve the efficiency and water production of reverse osmosis plant conducted by Muara Karang CCPP. • Keramasan CCPP utilizes river water as a raw material, which undergoes treatment in the PTP system to remove harmful dissolved substances. Additionally, the plant has innovated with the STRATA system, incorporating an extra installation in the form of a strainer made from palm fiber, designed to filter fine mud and ensure optimal water quality.

Physical Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Land use change	The development of GFPP and CCPP infrastructure may lead to the alteration of land use, although efforts are made to minimize impacts on species diversity and natural habitats.	Low	• PLN ensures that all power plants and transmission facilities have EIA documents as a commitment to environmental management through identification, mitigation, regulatory compliance, monitoring and evaluation. • Muara Karang CCPP, Keramasan CCPP, and Gilimanuk GFPP conducts monitoring of biodiversity protection status of flora and fauna, along with assessments of biodiversity index (H'). This monitoring aims to minimize species loss in their natural habitats due to land-use changes by identifying key species at risk and implementing timely conservation actions
Tree cover loss	Infrastructure projects may cause habitat fragmentation, affecting certain plant species, though reforestation initiatives help counterbalance these effects.	Medium	• In-situ conservation of endemic plants to increase Bali Myna population and preservation of endemic orchid plants in West Bali National Park. • The "Organic Forest" program addresses the physical risk of tree cover loss by rehabilitating critical lands prone to landslides in the Megamendung area. Since 2019, Muara Karang CCPP and Organic Forest Foundation have restored 2 hectares of land through agroforestry, expanding to 4 hectares by 2023. These efforts enhance ecosystem resilience, reduce erosion risks, and promote sustainable ecotourism while empowering local communities.

Physical Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Pollution	Pollution refers to the presence of harmful substances or contaminants in the environment, leading to adverse effects on ecosystems, human health, and the overall quality of air, water, and land.	Very High	Muara Karang CCPP has innovated by converting the manual cleaning process of the SWBP strainer into an Internal Cleaning System at Block 2, resulting in significant operational improvements. Initially, the seawater's high impurity content required frequent manual cleaning of the strainer, leading to longer cleaning times and an increased risk of performance degradation. The newly implemented system optimizes the cleaning process, enabling more efficient, environmentally friendly, and safer operations. With automatic cleaning, the strainers are now cleaned more effectively without manual intervention. This innovation has enhanced overall process efficiency and positively impacted Value Chain Optimization, ultimately benefiting both the company and the environment.

NATURE-RELATED REPUTATIONAL RISK

PLN proactively addresses significant reputational risks related to nature, considering the growing public concern over environmental/nature issues. PLN recognizes that negative perceptions of the environmental impact of power plants, such as ecosystem damage and biodiversity loss, could harm its reputation. This could lead to public protests, reduced stakeholder support, and increased regulatory pressure, all of which could disrupt long-term operations. To address these risks, PLN prioritizes transparency, effective communication, and adherence to national and global environmental standards. Further details for each category can be found below based on the prioritization of reputational risk and other strategic areas.

The reputational risk scores and classifications presented below, based on four power plants, correspond to the same plants listed in the physical risk assessment. The analysis of these risk scores and classifications was conducted using the same tool, the WWF's Biodiversity Risk Filter. The resulting scores are integrated into PLN's mitigation actions to evaluate the effectiveness of nature-related programs, specifically regarding reputational risks.

Table 13. Reputational risk, impact, and mitigation

Reputational Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Geothermal Power Plant (GPP)			
Protected/ conserved areas/ KBA	The potential for community concern if geothermal projects are seen as impacting conservation areas or if local community engagement is not adequately addressed. This may lead to heightened scrutiny or public attention.	Very High	• PLN ensures that all power plants and transmission facilities involve local community through participation on developing EIA documents process as well as other environmental documents. • Mount Salak GPP conserves the endemic species of the Javan gibbon, leopard, and Javan eagle. For the Javan eagle, a breeding house and education centre was built in the Mount Halimun Salak National Park.
Ecosystem condition	Ecosystem degradation can create significant reputational risks for companies, as they may be seen as failing to protect the environment. This could lead to negative perceptions from stakeholders, increased regulatory scrutiny, and harm to the company's public figure.	High	Mount Salak GPP has a Forest Security Socialization program. This initiative aims to raise community awareness about the importance of forest sustainability and enhances their capacity to help maintain ecosystem condition security, particularly in Mount Halimun Salak National Park and the surrounding areas.
Range rarity	This risk reflects the potential threat to rare or geographically limited species within the area. Operations located in biodiversity-rich zones can impact these species, especially if they are confined to specific, restricted habitats near project sites.	High	Mount Salak GPP collaborates with Mount Halimun Salak National Park (2016-2023) through the Javan Hawk-eagle Conservation Program. This includes implementing habitat preservation measures and ongoing biodiversity monitoring to ensure minimal disruption to local species, particularly those with limited geographic ranges.
Socioeconomic factors	This risk pertains to the potential socio-economic impacts of PLN operations on indigenous communities, including access to essential resources like food, water, and clean air.	Medium	Mount Salak GPP's community-based programs, such as native species planting, nurseries, biogas production training, and organic fertilizer workshops, showcases its commitment to environmental sustainability and biodiversity conservation. These efforts are further strengthened by involving local communities.

Reputational Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Additional reputational (media scrutiny, political situation)	Community The possibility of increased media or political attention if geothermal projects are perceived as not involving communities or if regulatory compliance is questioned, especially in areas of high biodiversity value.	Medium	• Mount Salak GPP has an official website https://kehatipowergsl.com/ accessible to the public that provides information about ongoing biodiversity programs, ensuring transparency in public information. This openness strengthens PLN's additional reputational standing by demonstrating a commitment to responsible environmental management and public engagement. • Mount Salak GPP's community-based programs, such as native species planting, nurseries, biogas production training, and organic fertilizer workshops, showcases its commitment to environmental sustainability and biodiversity conservation. These efforts are further strengthened by involving key stakeholders, including local communities, the government of Halimun Salak, academics, and consultants, in biodiversity monitoring programs. • Power plants units have a commitment to support the SDGs listed in the company's 2023 policy in environmental management programs along with community development programs referring to and focused on the achievement of the SDG's.

Reputational Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Gas Fired Power Plants (GFPP) & Combine Cycle Power Plant (CCPP)			
Protected/ Conserved/KBA	The potential for community concern if projects are seen as impacting conservation areas or if local community engagement is not adequately addressed. This may lead to heightened scrutiny or public attention.	High	• PLN ensures that all power plants and transmission facilities involve local communities through participation on developing EIA documents process as well as other environmental documents. • Gilimanuk GFPP conducts in-situ conservation of Bali Myna in West Bali National Park. • Gilimanuk GFPP, Keramasan CCPP, and Muara Karang CCPP conduct monitoring of flora and fauna diversity to monitor the H' index. This activity involves stakeholders such as the government, local communities, consultant, etc.
Ecosystem condition	Ecosystem degradation can create significant reputational risks for companies, as they may be seen as failing to protect the environment. This could lead to negative perceptions from stakeholders, increased regulatory scrutiny, and harm to the company's public image.	Medium	The Ecomarine Kali Adem program, led by Muara Karang CCPP, has successfully transformed a once degraded area into a thriving ecosystem, benefiting both the local community and the surrounding environment. This success highlights the effectiveness of reforestation and ecosystem restoration efforts, which are strengthened by strategic partnerships and consistent management practices.
Range rarity	This risk reflects the potential threat to rare or geographically limited species within the area. Operations located in biodiversity-rich zones can impact these species, especially if they are confined to specific, restricted habitats near project sites.	High	• Keramasan CCPP collaborates with South Sumatra BKSDA strengthen the function of the Sumatran Elephant training centre at Padang Sugihan Wildlife Sanctuary as an important habitat to ensure survival, preserve ecosystems, and mitigate conflict.

Reputational Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
			• Gilimanuk GFPP collaborates with West Bali National Park to protect and increase the Bali Myna population through a captive breeding program. This program aims to release the bred Bali Myna into the wild to restore their population.
Socioeconomic factors	This risk pertains to the potential socio-economic impacts of PLN operations on indigenous communities, including access to essential resources like food, water, and clean air.	Medium	Muara Karang CCPP collaborates with the local government and KOMMA as local communities to manage the Ecomarine Kali Adem. This partnership, ongoing since 2012, focuses on strategic biodiversity conservation and mangrove development. These efforts not only contribute to environmental sustainability but also enhance essential resources like water and land shown in Figure 15, the condition of the area before and after eco-marine program Gilimanuk GFPP collaborates with local communities in a program to utilise waste from the tofu production process. This programme has an impact on the environment, which can reduce the piles of tofu pulp waste disposed of into the environment, and the local community receives additional income, and can open up employment opportunities for women.

Reputational Risk	Risk Definition	Risk Level	PLN's Action and Mitigation
Additional reputational (media scrutiny, political situation)	Community the possibility of increased media or political attention if GFPP/CCPP projects are perceived as not involving communities or if regulatory compliance is questioned, especially in areas of high biodiversity value.	High	• Muara Karang CCPP collaborates with the local government and KOMMA in managing the Ecomarine Kali Adem. This partnership, ongoing since 2012, focuses on strategic biodiversity conservation and mangrove development. These efforts not only contribute to environmental sustainability but also enhance PLN's reputation as a responsible corporate entity, reinforcing positive relations with local stakeholders and mitigating reputational risks. • Gilimanuk GFPP cooperates with government West Bali Gilimanuk National Park in preserving protected fauna. • PLN is committed to supporting the SDGs through its 2023 policy, which emphasizes environmental management and community development programs focused on achieving the SDGs.

Based on Table 13, we can identify priority risks, particularly those with a "very high-high" score. For physical risks, the main priorities include water availability, air condition, and pollution. The focus should be on Protected/Conserved Areas and KBA, ecosystem condition, range rarity, and additional reputational for reputational risks. These prioritized risks will guide the establishment of strategic targets tailored to the specific conditions of each power plant area. By taking this approach, PLN can effectively mitigate risks and minimize their impact, thereby supporting long-term sustainability.

METRICS & TARGETS

- NATURE-RELATED METRICS
- NATURE-RELATED TARGETS

TNFD REPORT

Taskforce on Nature-related Financial Disclosure

NATURE-RELATED METRICS

Nature-related metrics play an important role in measuring environmental impacts and operational sustainability. In this section, the metrics discussed are specific to power plants in areas with high biodiversity value, particularly those with risk scores ranging from high to very high. According to the strategy section, the specific four power plants include CCPP, GFPP, and GPP. By using these metrics, power plants can conduct regular evaluations and minimize environmental impacts. Detailed descriptions of each metric are provided below.

Biodiversity and Reforestation

This metric is a key component of PLN's nature management strategy and is monitored annually across all power plant units. Regular monitoring evaluates the health and stability of ecosystems surrounding the operational sites, particularly in biodiversity-rich areas. These assessments help identify any potential nature impacts from operational activities and provide valuable data for continuous improvement in conservation efforts. The monitoring results enable PLN to measure the effectiveness of its mitigation and restoration programs, track changes in biodiversity, and ensure compliance with national and international conservation standards. Additionally, biodiversity monitoring plays a critical role in supporting reforestation efforts, as it helps identify degraded areas needing restoration and assesses the progress of reforestation initiatives. By monitoring changes in vegetation cover and species composition, PLN can effectively prioritize reforestation activities, ensuring that restored areas contribute to ecosystem recovery and biodiversity enhancement.

Table 14. Cumulative conservation area and total tree planting

	Conservation area (Ha)		Reforestation (tree)	
	2022	2023	2022	2023
GFPP/CCPP	10,48	12,48	20.965	20.002
GPP	12,15	12,24	2.056	3.406

PLN's conservation efforts include both in-situ and ex-situ areas. In-situ areas occur near power plants and operational areas, often within national parks, such as the Bali Myna breeding program in West Bali National Park and the Javan Hawk-Eagle released in Mount Halimun Salak National Park. Ex-situ conservation areas, which take place outside the species' natural habitats, include Sentigi Plant Education and Conservation Park at Gilimanuk GFPP and Ecomarine Kali Adem Mangrove Rehabilitation at Muara Karang CCPP.

Table 15. Biodiversity index of flora and fauna species

	Flora H'		Fauna H'	
	2022	2023	2022	2023
GFPP/CCPP	2,7	2,81	2,26	2,44
GPP	1,59	1,61	1,29	1,32

PLN conducts regular annual monitoring of flora and fauna. The flora and fauna biodiversity index increased in both GPP and GFPP and also CCPP compared to the previous year. By monitoring this index, we can identify which power plant activities have contributed to the increase in flora and fauna diversity in the surrounding area, ensuring that power plant operations are carried out sustainably with due regard for the local ecosystem.

NATURE-RELATED TARGET

Based on priority risks, PLN can gradually set specific and relevant strategic program targets, particularly by enhancing efforts to conserve and rehabilitate degraded ecosystems. PLN is committed to minimizing the environmental impacts of its operations by implementing various biodiversity-focused initiatives. At every stage, from planning to execution, PLN ensures that all actions account for potential impacts on nature, identifying and mitigating biodiversity risks that may arise from its activities. Several short-term targets that can be implemented to minimize risks include the following strategic programs.

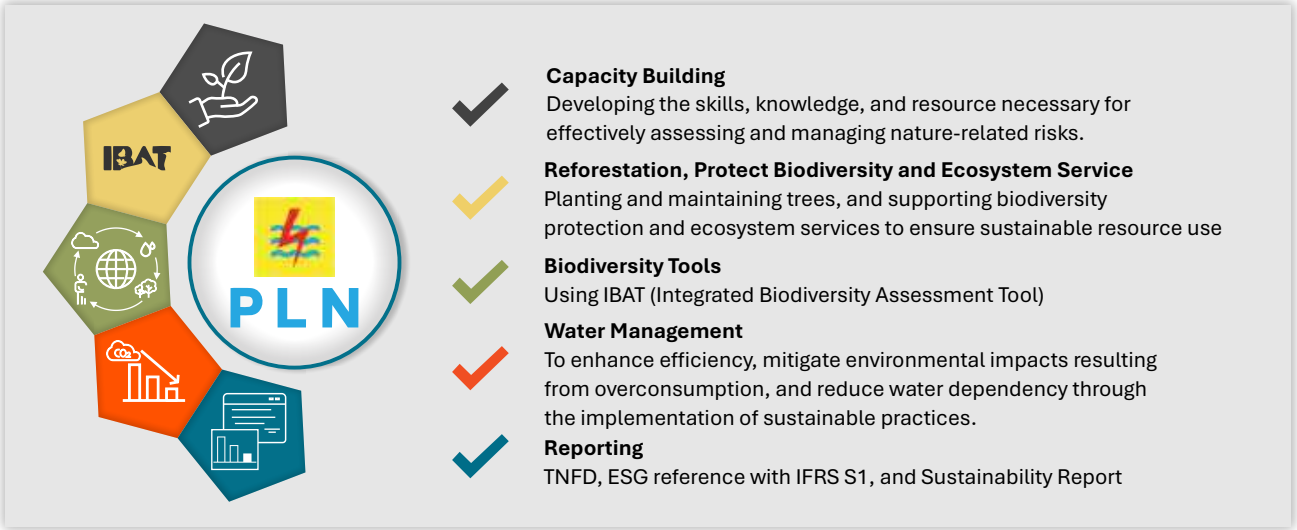


Figure 17: PLN Target in Nature Management

Capacity Building

The capacity-building initiative represents PLN's commitment to equipping its workforce with the knowledge, skills, and resources necessary to effectively assess and address nature-related risks. This process involves training on nature-related issues and understanding their relevance to corporate sustainability strategies. By improving the capability of its workforce, PLN ensures its efforts are aligned with global standards for biodiversity conservation and sustainability, allowing the company to make informed decisions that benefit both business and nature. To support this capacity-building effort, PLN is developing a Sustainability Academy managed by its Corporate University. The Academy offers several training programs, seminars, and workshops on environmental issues include biodiversity aspects, renewable energy, energy efficiency, and waste management, with participants from field technicians to senior management. Additionally, it serves as a research and development center, fostering collaborations with educational institutions, NGOs, and industry partners to develop innovative solutions for PLN's sustainable energy transition.

Reforestation, Protect Biodiiversity and Ecosystem Service

Reforestation programs to preserve and improve nature quality include reducing carbon emissions by increasing the number of seedlings and planting trees. These programs also involve stakeholders, including local communities, government agencies, non-profit organizations, students, and international partners, as a collaborative effort to restore critical areas and expand planting areas. By working together, these stakeholders can maximize the impact of reforestation efforts and contribute to the conservation and sustainable management of forests worldwide. After planting, ongoing monitoring and maintenance are critical to ensure the success of the reforestation efforts.

Complementing these reforestation efforts, management targets for biodiversity protection focus on maintaining ecosystem services and safeguarding critical species, ensuring that reforested areas support a resilient and interconnected ecological network. An ecosystem service is a specific, measurable objective designed to guide

conservation efforts and ensure the sustainable use of natural resources. We have coordinated biodiversity into our strategy processes and nature program. We are also committed to protecting threatened species based on the IUCN Red List to minimize any negative impacts. The management target for biodiversity and ecosystem services is to ensure that protected areas are ecologically representative and well-connected to form integrated ecological networks and establish and maintain robust biodiversity monitoring species

Biodiversity Tools

PLN employs specialized biodiversity tools to strengthen its biodiversity management efforts and train employees in their effective use. Tools such as iBAT (Integrated Biodiversity Assessment Tool) are essential for biodiversity screening during project planning and development. These tools facilitate the evaluation of potential environmental risks early in the project lifecycle by providing detailed data on globally significant conservation areas, species status based on the IUCN Red List, and site-specific ecological sensitivity. This proactive approach supports PLN's sustainability commitment and aligns with global best practices, enabling informed decision-making to minimize biodiversity impacts.

Water Management

To address the "High" risk level associated with water availability for power plant operations, and mitigate any adverse effects on community water resources, PLN has set a comprehensive water management target aligned with TNFD reporting. This target focuses on sustainable water management practices aimed at mitigating operational impacts and supporting efficiency during periods of high demand or environmental stress. The initiatives include implementing a 3R program (Reduce, Reuse, Recycle), which maximizes water recycling within power plants operations, reduces wastewater generation, protecting water resources, water-saving programs, and improves water management practices.

Reporting

We regularly report our progress and performance against our targets in sustainability, and ESG reports yearly through environmental performance reviews. Each unit reports on the program for identifying, monitoring, and maintaining nature at its power plant.

FUTURE PLAN

In the upcoming financial year, PLN remains committed to transparent engagement on sustainability performance and will continue to enhance its reporting approach in accordance with the TNFD Recommendation. Looking ahead, we plan to refine metrics and targets and establish baselines for metrics that still need to set targets.