CLIMATE-RELATED DISCLOSURE REPORT 2024

Danantara Indonesia

PLN

Sustainability-Related Financial Disclosure

01

PLN AT A GLANCE

EXECUTIVE SUMMARY

Background

PT Perusahaan Listrik Negara (PLN) Persero recognizes climate change as both a strategic risk and an opportunity to drive sustainable business resilience. Aligned with Indonesia's net zero emissions (NZE) 2060 target and the International Sustainability Standards Board (ISSB)'s IFRS S2, this report discloses PLN's governance, strategy, and progress in managing climate-related financial impacts. By integrating climate considerations into decision-making, PLN aims to balance energy security, affordability, and decarbonization while creating long-term value for stakeholders.

Governance

One of many efforts taken by PLN to achieve NZE in 2060 was the establishment and institutionalization of climate oversight through a structured governance framework. To support and discuss the progress of programs as well as resolve any challenges related to the risks and opportunities of climate change, PLN organizes weekly meetings for each workstream (including energy transition, environmental, social and governance (ESG), enablers, and NZE Moonshot) and a bi-weekly Board of Directors (BOD) update on Sustainability War Room (SWR).

Strategy

PLN has established the Accelerated Renewable Energy Development (ARED) scenario is the cornerstone of its decarbonization strategy and is designed to maintain energy resilience and meet emissions targets. Through ARED, PLN aims to achieve a 75% renewable energy mix by 2030. Despite incurring high capital expenditures (CAPEX), the ARED scenario offers lower operational expenditures (OPEX) when compared to the Business-as-Usual (BAU) scenario. Although this scenario will face a mismatch between the large-scale deployment of renewable energy sources and the concentration of demand, PLN plans to address this challenge through its Green Super Grid strategy, which will transfer 33 GW of baseload new and renewable energy to demand centers.

Risk Management

PLN adheres to ISO 31000 to systematically address climate risks and achieve its climate targets. Climate-related physical and transition risks are categorized based on its opportunity for profit or loss and the impact level, which is divided into five types: very low, low, moderate, high, and very high.

Metrics and Targets

PLN focuses its climate-related metrics on greenhouse gas (GHG) emissions, aligning with Indonesia's Enhanced Nationally Determined Contribution (E-NDC), which targets a reduction of 358 million tCO_2 in the energy sector. As the primary player in the electricity subsector, PLN is expected to contribute 35% of this target, approximately 127 million tCO_2, through a range of emission reduction initiatives. To meet this commitment, PLN is advancing the energy transition toward renewable sources, supported by sustainable financing, carbon pricing mechanisms such as carbon credits, and the implementation of climate change adaptation measures, while setting clear GHG emission reduction goals to address long-term climate risks.

Conclusion

This IFRS S2 report reflects PLN's proactive approach to climate-related financial disclosures, demonstrating how decarbonization aligns with long-term business resilience. By prioritizing renewables, robust governance, and risk-aware investments, PLN is positioned to lead Indonesia's energy transition while delivering value to shareholders and the nation.

DIRECTOR'S STATEMENT

It is my tremendous privilege to present PLN's 2024 Climate-related Disclosures underscoring our commitment to integrating climate considerations across all operations in support of Indonesia's, Nationally Determined Contribution (NDC) 2030 and NZE 2060 goals.

For PLN, 2024 was a turning point, where we launched a number of steps to improve our Company's climate resilience performance. Our climate initiatives are concentrated on the renewable energy transition through the ARED scenario, a renewable capacity mix 75% targeting 61 GW. This expansion will be driven primarily by baseload hydro and geothermal energy. By 2040, under this scenario, 33 GW of renewable energy capacity will originate from baseload sources, while 28 GW will come from variable renewable energy (VRE) sources like solar and wind as well as the addition of new energy sources including 2.4 GW from nuclear sources by 2040.

As a concrete demonstration of its commitment to renewable energy, PLN completed the construction of several renewable power plants with a total capacity of 480 MW during 2024, accompanied by comprehensive supporting infrastructure. The renewable power plants commissioned in that year include two hydro power plants, Asahan #3 Hydro Power Plant and Jatigede Hydro Power Plant with capacity of 2 x 87 MW and 2 x 55 MW respectively and the first phase of the IKN Solar Power Plant with a capacity of 10 MW.

As of December 2024, a total of 3.4 GW of power plant projects have entered the construction phase, distributed across 105 individual projects, all of which require close supervision and special attention to ensure timely completion in accordance with the company's strategic planning.

Our business plan ensures energy remains affordable, reliable, and accessible, while upholding our responsibility to drive environmental sustainability. This commitment is embedded within our broader corporate strategy and is supported by a robust risk management framework that aligns with international best practices.

As part of our ongoing efforts to strengthen climate-related governance, PLN has integrated the Transition Plan Taskforce (TPT) Framework, to enhance transparency and accountability in our transition strategy. The integration of the TPT Framework strengthens governance and aligns our transition plan with global standards for transparent, accountable climate action. It enables us to articulate our Strategic Ambition in a comparable format, outlining how we contribute to a low GHG-emissions and climate-resilient global economy.

By integrating our climate strategies into our corporate risk management framework, we transform sustainability from an aspiration into a driver of long-term value. This report reflects PLN's operational commitment to achieving NDC and NZE targets through systematic emission reductions, leveraging climate opportunities for stakeholder value, all while maintaining leadership in Indonesia's energy transition, We remain steadfast in making sustainability our competitive advantage, today and for generations to come.

Jakarta, 23 May 2025

Evy Haryadi

Director of Transmission and System Planning

PREFACE

I am pleased to present PLN's third Climate-related Disclosure report. This report provides climate-related financial disclosures covering governance, strategy, risk management, as well as metrics and targets. This report marks an important step in our ongoing commitment to transparent climate risk disclosure.

PLN is transforming into a clean power company. At COP 26, we reinforced our commitment to the renewable energy transition and the achievement of Net Zero Emissions (NZE) by 2060. This commitment aligns with both the Indonesian government's NZE 2060 target and our responsibility to address climate change, guided by the principle of common but differentiated responsibilities.

PLN is expanding its clean energy capacity to meet Indonesia's growing power demand while continuing to support economic development. Our NZE scenarios, project emissions peaking in 2030 before steadily declining to achieve Net Zero by 2060 reducing our GHG emissions by 1.057 million tons in 2060, compared to the business-as-usual scenario.

Sustainability is a shared responsibility across PLN's leadership, workforce, and partners. We rigorously apply Sustainable Business Principles into our business activities and integrate ESG priorities into our operations. Amid rising concerns about the impacts of climate change on our value chain, we are bolstering our climate resilience in line with the International Sustainability Standards Board (ISSB)'s IFRS S2 standard. By centering this framework for analysis, we are committed to advancing our Net Zero journey while simultaneously strengthening our capabilities to effectively manage climate-related risks and opportunities.

This year, we deepened the integration of climate risk management including the TPT Framework into our reporting practices, advancing transparency and governance in our transition strategy. This progress also serves as a foundation for our early adoption of Indonesia's upcoming PSPK 1 and PSPK 2, which will align local sustainability disclosures with the ISSB's International Financial Reporting Standards (IFRS) S1 and S2 standards. This report marks our inaugural application of these global standards.

Given the varied and evolving impacts of climate change on our assets and operations differently building robust reporting capabilities will take time. Our Climate-related Disclosure Report outlines our current position and identifies areas for further improvement. We look forward to collaborating with our stakeholders and sharing updates in future IFRS S2 reports as we regard our sustainability work as a catalyst for long-term value creation and enhanced performance.

On behalf of PLN, I would like to convey our gratitude to our stakeholders for acknowledging climate change as a priority issue and supporting PLN's sustainable transformation. While the journeys ahead presents both opportunities and challenges, we remain steadfast in achieving PLN's vision for a sustainable future - together.

Kamia Handayani
Executive Vice President
Energy Transition and Sustainability

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ADB	Asian Development Bank
APPLE-GATRIK	*Aplikasi Perhitungan dan Pelaporan Emisi Ketenagalistrikan* (Electricity Emission Calculation and Reporting Application)
ARED	Accelerated Renewable Energy Development
BAU	Business as Usual
BOC	Board of Commissioners
BOD	Board of Directors
CAPEX	Capital Expenditure
CCPP	Combined Cycle Power Plant
CCS	Carbon Capture and Storage

CCUS	Carbon Capture Utilization and Storage
CFPP	Coal-Fired Power Plant
COP	Conference of the Parties
CWR	Cash War Room
E-NDC	Enhanced Nationally Determined Contribution
ESG	Environment Social Governance
ETS	Emission Trading Scheme
ETS	Energy Transition and Sustainability (*Divisi Transisi Energi dan Keberlanjutan*)
EV	Electric Vehicle
GEAS	Green Energy as a Service
GHG	Greenhouse Gas
GW	Gigawatt
GWP	Global Warming Potential
HEPP	Hydroelectric Power Plant
IFRS S2	International Financial Reporting Standards for Climate-related Disclosures
IPP	Independent Power Procedures
IWR	Investment War Room
JAMALI	Java, Madura, Bali
JETP	Just Energy Transition Partnership
JICA	Japan International Cooperation Agency
LCOE	Levelized Cost of Electricity
MWh	Megawatt hour
MWp	Megawatt peak
NDC	Nationally Determined Contribution
NRE	New & Renewable Energy
NZE	Net Zero Emission
OPEX	Operational Expenditure
PV	Photovoltaic
PPI	Climate Change Management
PPP	Public-Private Partnership
PTBAE-PU	*Persetujuan Teknis Batas Atas Emisi-Pelaku Usaha* (Technical Approval of Emission Upper Limit-Business Operator)
RE	Renewable Energy
REC	Renewable Energy Certificates
RKAP	*Rencana Kerja dan Anggaran Perusahaan* (Company Work Plan and Budget)
RUPTL	*Rencana Usaha Penyediaan Tenaga Listrik* (National Electricity Supply Business Plan)
SDG	Sustainable Development Goals
SEAPOWER	Sea Environment Analytic & Prediction for Power Plant
SPE-GRK	*Sertifikat Pengurangan Emisi* – Gas Rumah Kaca
SPKLU	*Stasiun Pengisian Kendaraan Listrik Umum* (Public Electric Vehicle Charging Stations)
SWR	Sustainability War Room
TCFD	Task Force on Climate-Related Financial Disclosure
TNFD	Task Force on Nature-related Financial Disclosure
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
US EPA	United States Environmental Protection Agency
USAID	United States Agency for International Development
VRE	Variable Renewable Energy

02

GOVERNANCE

GOVERNANCE

Climate-Related Governance

As a 2015 signatory to the Paris Agreement, Indonesia committed to a 29% reduction of GHG emissions by 2030 through domestic efforts, with the potential to achieve up to a 41% reduction with international support. This pledge was further strengthened in 2022 by the Enhanced NDC (E-NDC), which aims for a domestic 31.9% reduction and a 43% reduction with international support.

The energy sector is Indonesia's largest emissions source, contributing an estimated 1.7 million tons CO_2e per year, as the surpassing forestry, agriculture, waste, and industry sectors. Achieving the emissions targets demands transformative action with PLN positioned as a critical enabler of the national decarbonization agenda. Recognizing the importance of its role, PLN has implemented a dedicated governance framework focused on climate-related issues to ensure effective oversight of climate risks and opportunities and has worked to integrate them into strategic planning and enterprise risk management.

PLN's Commitment to Energy Transition

As Indonesia's state-owned energy company, PLN recognizes its responsibility in supporting the country's NDC 2030 and NZE 2060 goals through a structured energy transition strategy. PLN has taken proactive steps to shift its business toward cleaner energy production, with clear roles and responsibilities assigned across divisions. These efforts are regularly guided and monitored by PLN's Board of Directors and management teams to ensure effective implementation. PLN's climate commitment is governed by three key policies:

- Director's Regulation No. 0161 of 2021 – Strategic Policy for Climate Change Management.
- Directors' Decision No. 0322 of 2024 – Establishment of the Sustainability Committee of PT PLN (Persero).
- Director's Circular No. 0025 of 2022 – Standard Procedures for Greenhouse Gas Emissions Management.

SUSTAINABILITY COMMITTEE

Sustainability Governance and Oversight

Board Oversight & Sustainability Committee

PLN is committed to embedding sustainability across all its operations and is guided by PLN's Statement of Corporate Intent No. 0314 of 2022 on Sustainable Business Principles. This commitment ensures Environmental, Social, and Governance (ESG) values are ingrained throughout all PLN's workforce and in its corporate strategy, aligning with shareholder expectations and driving long-term value creation PLN's BoD and Board of Commissioners (BoC) oversee corporate strategy, policy, and risk management, and governance acknowledging the increasing importance of sustainability and climate-related risks and opportunities in strategic decision-making and enterprise risk management.

The BoD issued Director's Decision No. 0322 of 2024 to institutionalize ESG oversight by establishing the Sustainability Committee of PT PLN as illustrated in **Figure 1**. This Committee serves as a strategic advisory body and supports PLN's transformation into a future-ready, sustainable company. To support effective implementation across the organization, Sustainability Committees have also been established within PLN Units, Sub-holdings, and subsidiaries. These committees are responsible for executing sustainability initiatives that are aligned with the specific business processes and operational contexts of each respective unit and entity. The Committee's supervision covers three core areas:

1. Environmental initiatives (excluding energy transition activities);
2. Climate change management (specifically linked to energy transition efforts); and
3. Social and governance initiatives.

Appointed by the Directors, Executive Vice President of the Energy Transition and Sustainability (*Transisi Energi dan Keberlanjutan* (TEK)) Division, serves as the Chair of the Committee. The Committee, which reports to the BoC, is responsible for establishing strategic direction, evaluating performance towards sustainability targets, and ensuring that ESG projects align with both the long-term business goals of the corporation and the United Nations Sustainable Development Goals (SDGs).

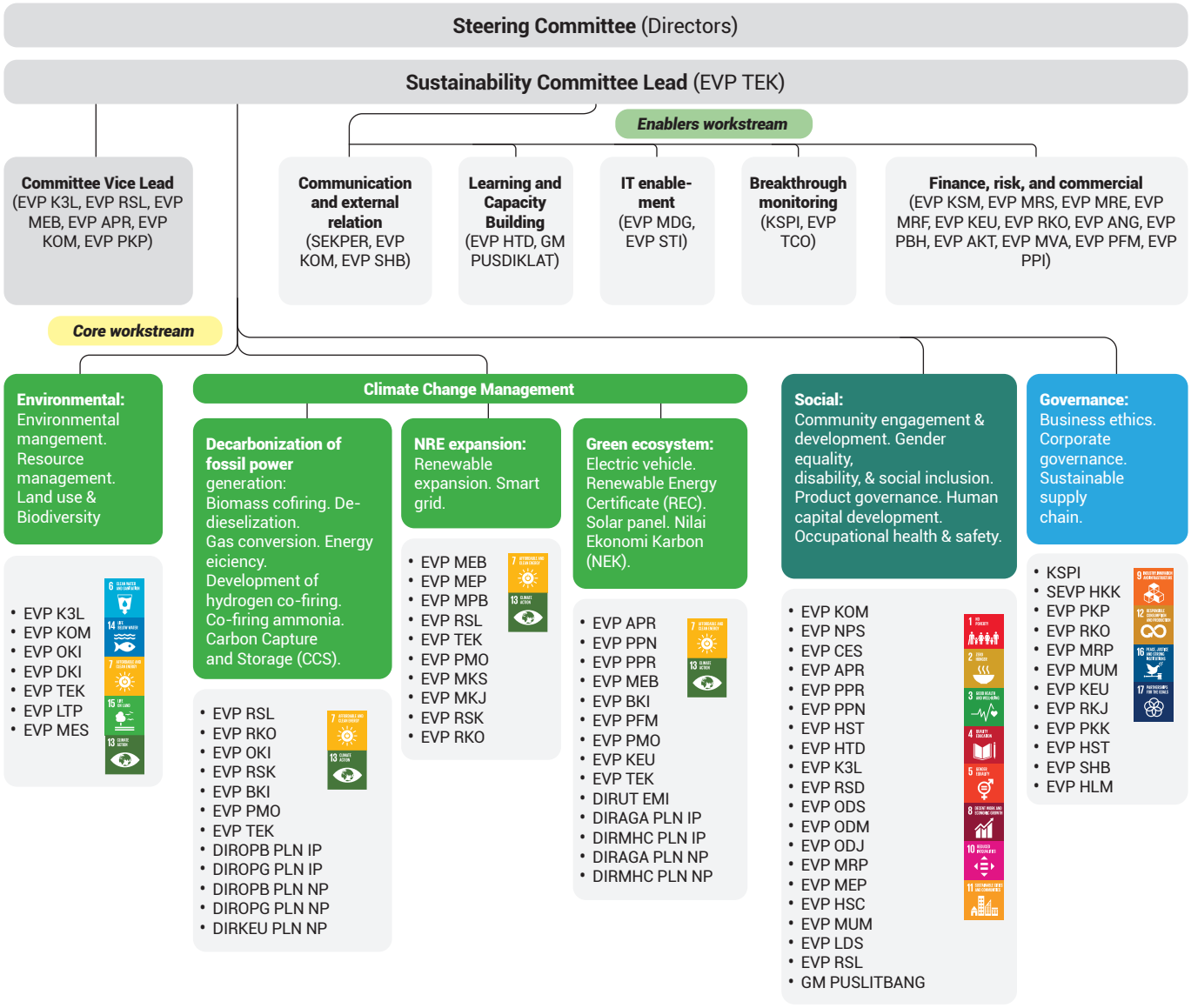


Figure 1 Sustainability Committee Organizational Structure

Role of Management

At the managerial level, the Energy Transition and Sustainability (*Transisi Energi dan Keberlanjutan* (TEK)) Division leads the execution of PLN's Net Zero Roadmap and other climate-related initiatives. The division is responsible for overseeing transition and physical climate risks, ensuring compliance with global reporting standards such as TCFD and ISSB, and implementing essential energy transition initiatives.
The (*Transisi Energi dan Keberlanjutan* (TEK)) Division's responsibilities include:

- Setting and monitoring PLN's sustainability and decarbonization targets
- Implementing climate risk assessments and mitigation measures
- Driving company-wide alignment of ESG policies with corporate strategy
- Supporting the execution of scenario analyses, sustainability disclosures, and regulatory compliance

The division works closely with the Sustainability Committee and provides regular updates on progress to the BoD and BoC. This relationship has helped establish an ongoing feedback mechanism that connects strategic oversight with operational execution, emphasizing PLN's dedication to sustainability and its ability to withstand climate-related challenges.

Climate Related - Strategic Forum

PLN has established a cohesive governance framework that connects strategic direction, operational execution, and performance evaluation across the organization. This structure ensures effective alignment between Board oversight and management implementation of climate-related initiatives. The Climate-Related Strategic Forum serves as a key internal think tank and cross-functional platform, playing a vital role in coordinating efforts within this framework. By linking operational units within the Sustainability Committee, the Forum facilitates collaboration between senior leaders across planning, operations, finance, risk, and sustainability functions. This process ensures alignments with ESG objectives, evaluates scenario analysis outcomes, assesses transition preparedness, and enables agile responses to constantly evolving climate issues and regulatory changes.

To complement the Climate-Related Strategic Forum, PLN has implemented dedicated War Room platforms which serve as operational centers to enhance execution and track progress on key projects. These include:

1. **Sustainability War Room (SWR).** The SWR serves as the central hub for PLN's ESG and energy transition initiatives. It was developed to manage sustainability initiatives, monitor performance indicators, and address cross-cutting issues to ensure alignment with national objectives and global commitments, including Indonesia's NDC and PLN's Net Zero Roadmap.

   The SWR is a strategic platform coordinating PLN's ESG projects and energy transition roadmap. It centralizes oversight of sustainability programs, progress monitoring, challenge resolution, and cross-functional coordination in alignment with Indonesia's NDC (2030) and Net Zero Emissions (NZE) 2060 targets.

   Through biweekly meetings with the Board of Directors, the Sustainability Working Group supports the Sustainability Committee in implementing PLN's sustainability plan, ensuring effective oversight and collaboration across functions. This forum facilitates the organized implementation of ESG programs and promotes data-driven decision-making. The SWR enhances ESG performance and supports PLN's long-term objective of becoming a leading green utility by reinforcing its position as a key enabler.

The SWR closely monitors the progress of 29 strategic "moonshots," with a specific focus on four critical initiatives for NZE which include:

- Accelerated Renewable Energy Development (ARED): Position PLN as a leader and aggressively lead the renewable energy transition through post-2030.
- Green Enabling Transmission: Resolve national supply-demand imbalances by modernizing the grid and enhancing inter-island transmission connectivity to support renewable energy integration.
- Scale-up Co-firing Biomass: Reduce carbon emissions by 8.8 million tCO_2e by 2030 through the addition of biomass co-firing technology to retrofit coal plants.
- REC Market Expansion: Unlock IDR690 billion in green financing between 2023 and 2028 through the scaling of Renewable Energy Certificate instruments.

In addition, PLN has launched a Quick-Win ESG Strategy to accelerate ESG enhancements and focus on the main drivers that accounts for 65% of its material ESG risks.

- Carbon – Own Operations: Reduce direct emissions and improve energy efficiency across PLN's operations.
- Emissions, Effluents, and Waste: Strengthen environmental compliance and minimize pollutants through improved waste management.
- Community Relations: Enhance stakeholder engagement with local communities to ensure sustainable, inclusive, and socially responsible development.
- Resource Use: Implement sustainable sourcing to optimize natural resource consumption.

Each issue is underpinned by time-bound action plans and tracked through the SWR to ensure measurable outcomes, real-time accountability, and timely achievement.

2. **Investment War Room (IWR).** Launched in February 2024, the IWR serves as a biweekly forum dedicated to monitoring investment activities under the RUPTL (Electricity Business Plan) as established under Decree No. 033/K/DIR/2024. It ensures strategic investment decisions, particularly related decarbonization and grid transformation, are effectively coordinated adapt to evolving energy and environmental challenges.

Established by Decree No. 033/K/DIR/2024, the Investment War Room (IWR) was launched in August 2023 to oversee PLN's RUPTL-aligned electricity investment projects. The IWR operates as a centralized platform coordinating investment executive from planning to construction, with progress reviewed in biweekly meetings attended by the BoD, senior leadership, sub-holdings, and subsidiaries. The implementation structure of the steering committee is outlined in **Figure 2**.

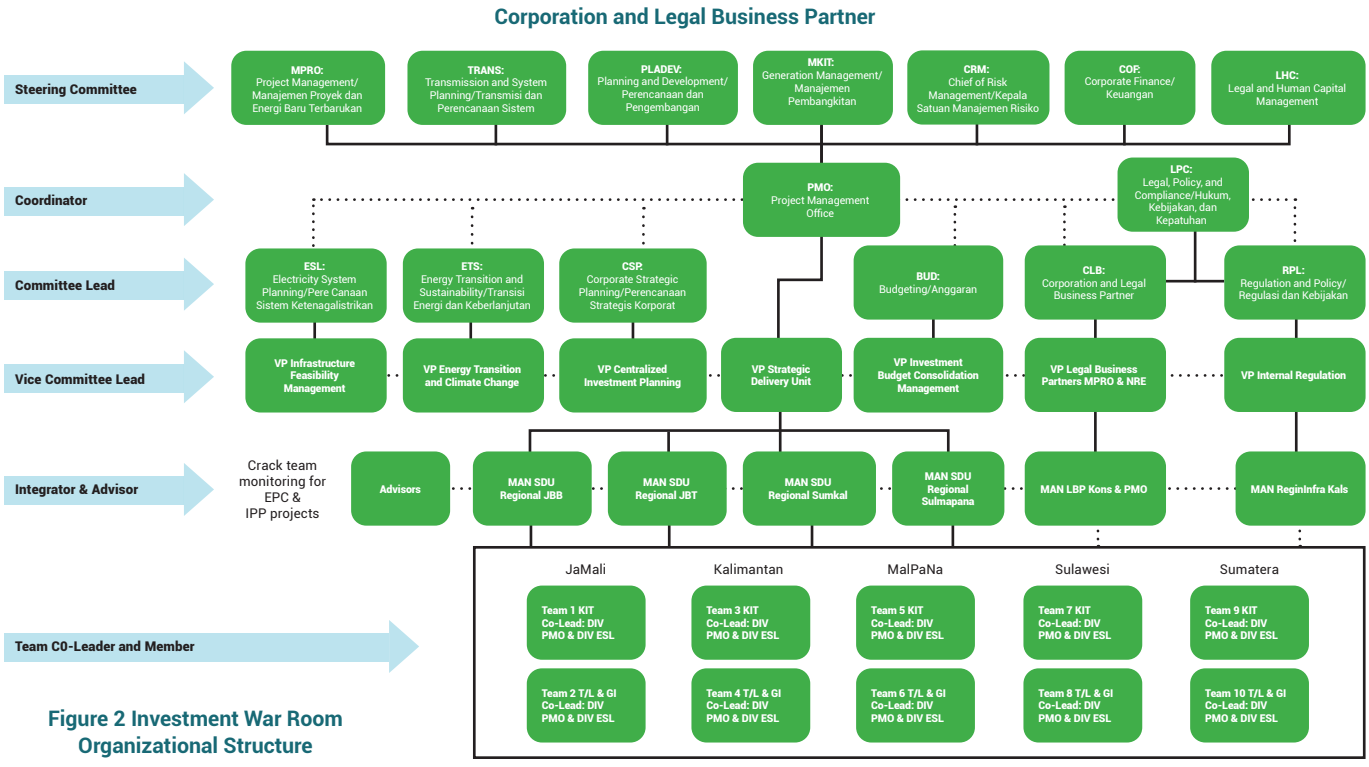


Figure 2 Investment War Room Organizational Structure

In its initial phase, the IWR focused on resolving bottlenecks through five main workstreams, covering areas as illustrated in **Figure 3.**

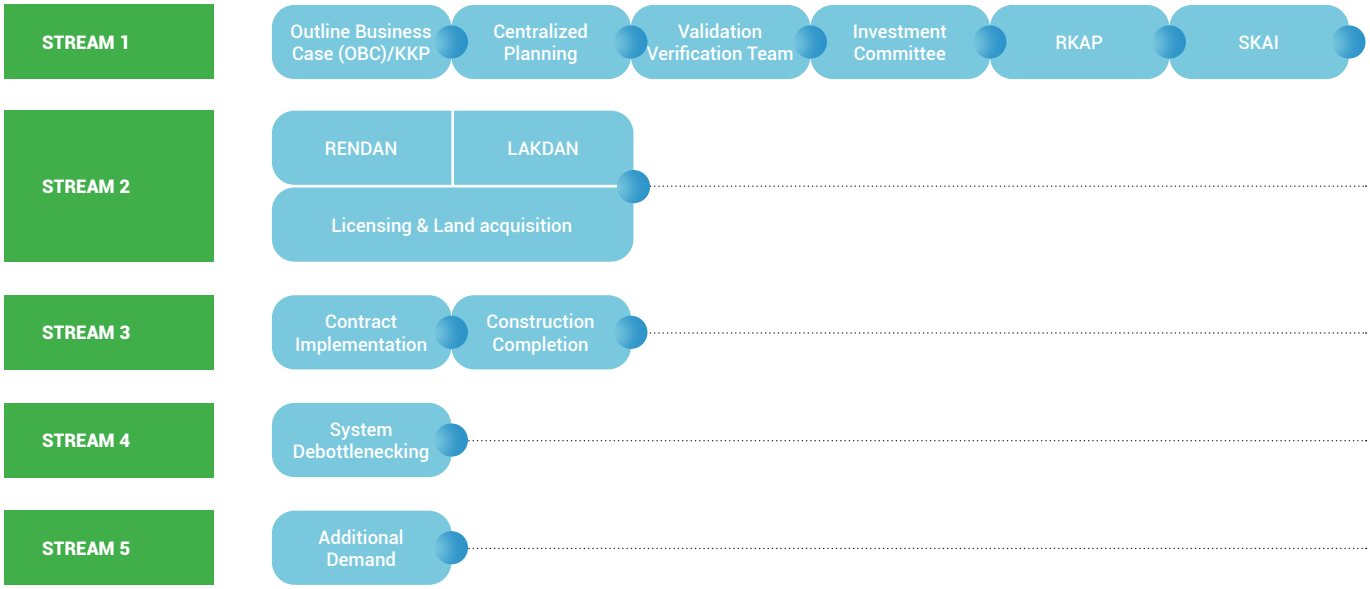


Figure 3 IWR Five Workstreams

The IWR has driven significant climate-related solutions, including supporting project timelines for renewable energy initiatives within the P100 portfolio, addressing supply chain bottlenecks like material pricing volatility, and optimizing ARED project bundling for scalable development. It has also conducted feasibility studies for priority projects and resolving and acquisition hurdles for essential infrastructure.

The IWR ensures disciplined execution of climate-critical investments by proactively identifying early risks and guiding the strategic direction of investments critical to climate initiatives. The IWR helps deliver timely projects supporting Net Zero goals, facilitate collaborative problem-solving throughout project phases, and maintain alignment with national decarbonization objectives. Through this structured oversight, the IWR reinforces PLN's capacity to deliver resilient and low-carbon power system while maximizing investor confidence in its energy transition strategy.

3. **Cash War Room (CWR).**
   Overseen by the Corporate Finance Division, the Cash War Room (CWR), tracks financial workstreams related to funding strategy and capital allocation, and liquidity management.

   Initially launched in June 2020 the Cash War Room has undergone interactive enhancements from CWR 2.0 to CWR 4.0. These developments were driven by the need to align the program with evolving organizational requirements and to expand its operational scope as ESG was originally a standalone workstream monitored by CWR but eventually grew into its own platform, Sustainability War Room. This progression reflects PLN's commitment to continuous financial optimization and developing a more sustainable performance. The progression of PLN's CWR initiatives is illustrated in the **Figure 4**.

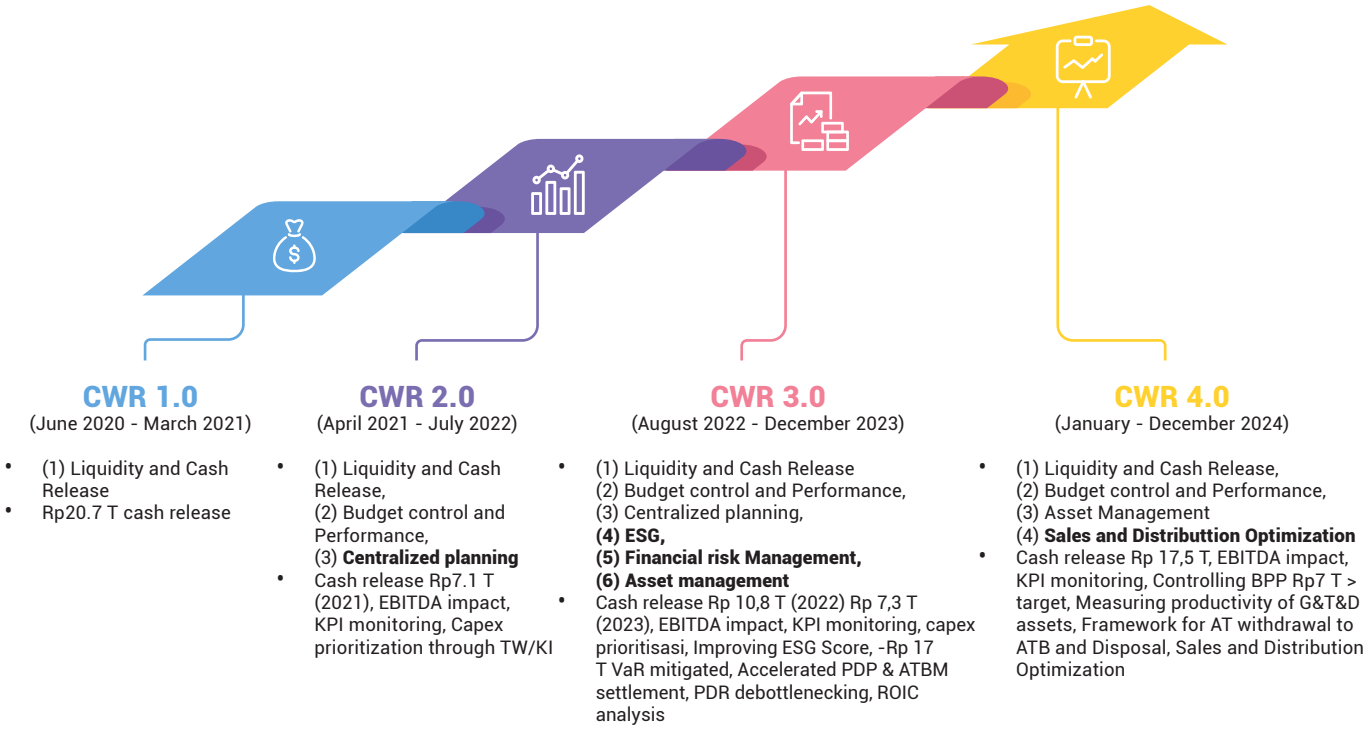


Figure 4 PLN's CWR initiatives

The CWR operates under executive leadership with participation from the BoD, chaired senior leaders and involved employees. The forum is led by the Director of Finance, Head Office senior management and subholding and subsidiary leadership. The CWR is organized into thematic workstreams, each focused on strategic or operational topics. These streams follow a structured schedule, presenting weekly at the CWR forum, submitting weekly progress reports for review by the BoD and are further disseminated to all CWR participants to ensure transparency, alignment, and timely decision-making. The organizational structure of the PLN CWR 4.0 team is depicted in the **Figure 5**.

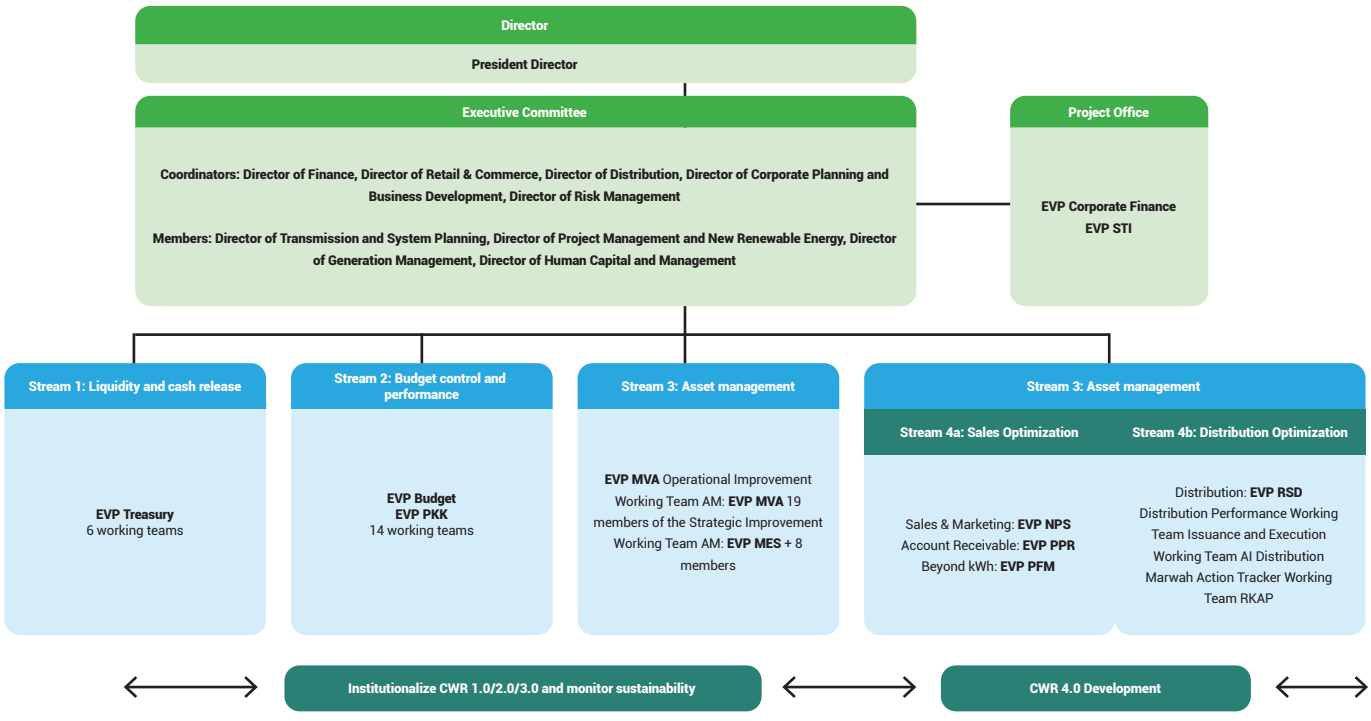


Figure 5 Organizational Structure of The PLN CWR 4.0 Team

These governance and coordination mechanisms enable PLN to systematically incorporate climate-related issues into its operational strategy, financial planning, and investment decisions. By structuring accountability from the Board to management, PLN ensures ESG performance is a driving force in achieving its long-term sustainability goals.

PROMOTING A CULTURE OF SUSTAINABILITY

PLN's operations span across Indonesia, involving numerous implementing units, which presents a challenge in ensuring consistent understanding of sustainability among personnel and stakeholders. To address this, PLN fosters a culture of sustainability through three key initiatives: (1) integrating sustainability performance parameters into each work unit using the Sustainability Maturity Level measurement; (2) establishing the Sustainability Academy as a center for developing sustainability competencies and enhancing organizational understanding; and (3) organizing events that promote a sustainability-driven organizational culture in support of PLN's Net Zero Emissions (NZE) 2060 goal and the acceleration of the energy transition.

In 2024, key initiatives enhanced internal capabilities, innovation, and encouraged strategic climate action engagement:

1. Developed in collaboration with USAID Sustainable Energy for Indonesia's Advancing Resilience (SINAR), PLN established the Sustainability Academy to enhance workforce competencies and embed sustainability into business processes. Launched at the Colony Summit in November 2024, the academy established six core modules focused on social impact in infrastructure projects, energy transition, climate change management, TNFD, and biodiversity.
2. The Light Your Green Action (LYGA) grassroots innovation competition focuses on fostering innovative solutions for climate-change related impacts including renewable energy adoption, community resilience encompassing food security and clean water access, biodiversity conservation, waste-to-biomass management, energy transition education. Notable 2024 submissions included community-focused sustainable agriculture programs, RDF-based waste management solutions, biomass briquettes, and solar desalination technologies.
3. During the Indonesia International Sustainability Forum (IISF) 2024, PLN showcased its approach to the energy ttrilemma through collaborative strategy, innovation, and investment.
4. Sustainability Day 2024 was organized in collaboration with the Heads of ASEAN Power Utilities/Authorities (HAPUA), focused with a Sustainable Finance theme. Officials from the Ministry of Finance, World Bank, ADB, OJK, and various financial institutions attended the event. The President Director of PLN demonstrated the role of sustainable financing in accelerating renewable energy investments in its ARED scenario and PLN also announced continued refinement of its Roadmap to attract greater investor engagement and bolster long-term climate objectives.

Skills, Competencies and Training

PLN prioritizes workplace upskilling to drive its climate agenda forward. A central tenet of this strategy includes investing in staff development to foster the skills and knowledge needed for a sustainable future. PLN supports staff member graduate and doctoral studies overseas, especially in new and renewable energy-related (NRE) fields via the Employee Study Assignment Program (PTB). PLN aims to employ at least 15% of strategic roles with staff holding advanced degrees.

PLN collaborates with foreign organizations including USAID, UNOPS, World Bank, ADB, JICA, and the Embassy of New Zealand to enhance technical and strategic expertise. In 2024, 163 PLN staff enrolled in overseas study programs, contributing to a total of more than 1,700 employees who have pursued advanced education abroad over the past three years.

PLN increases executive leadership capacity by engaging its BoD, BoC, and senior executives in high-level climate forums and specialized sustainability trainings. Key 2024 engagements included:

- Participation in COP29 reinforcing PLN's global climate commitment to global climate initiatives.
- ESG in Focus Executive Training delivered in partnership with Monash University.
- ADB Workshop on High-Level Energy Transition Technologies to advance technical and strategic expertise.
- Engagement in the Indonesia Investment Forum 2024 in London to promote Indonesia's renewable energy landscape and emphasize the strategic role of sustainable development in driving national growth.
- Participation in Indonesia Sustainable Energy Week (ISEW) 2024, co-hosted by the Ministry of Energy and Mineral Resources (MEMR) and Bappenas, and organized by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- The 7th Indonesia – China Energy Forum, which is a bilateral forum between Indonesia and China related to cooperation in the energy sector, including renewable energy.
- Participation in the Indonesia International Hydrogen Summit 2024 to support national energy independence, promote green hydrogen and ammonia as key pillars of Indonesia's energy transition, and foster international collaboration and investment in clean energy innovation.
- Conference in IDE Katadata 2024 about Powering the Future: Advancing Electrification and Renewable Energy.

These initiatives complement PLN's broader workforce development programs, ensuring alignment between leadership vision and operational execution of its sustainability agenda.

03

RISK MANAGEMENT

RISK MANAGEMENT

Climate-related Physical Risks

Physical Risk - Scenario Analysis

PLN evaluates physical climate risks using Representative Concentration Pathways (RCP) 4.5 and 8.5 simulated for the period of 2018–2050. These scenarios provide insights into climate-related risks and their potential impacts on Indonesia's energy sector. PLN systematically incorporates these assessments across all of its operations to ensure comprehensive risk identification and preparedness. The company conducts annual reviews of climate-related risks to its energy assets and infrastructure, supplemented by dedicated studies examining physical climate threats to power sector supply and demand. This physical risk assessment represents a distinct initiative from PLN's ARED scenario work, which focuses primarily on renewable energy transition pathways.

The analysis methodology incorporated field studies, interviews, and focus group discussions to evaluate climate vulnerabilities across PLN's generation, transmission, and distribution operations. Primary data collection focused on ten strategically important power plants including Saguling (HEPP), Cirata (HEPP), Tanjung Priok (CCPP), Muara Karang (CCPP), Tambak Lorok (CCPP), Suralaya (CFPP), Tanjung Jati B (CFPP), PJB Paiton (CFPP), and Paiton (CFPP).

Given the extensive geographic nature of Indonesia's electricity network, PLN has adopted a risk-based prioritization approach concentrating on Java and Bali. This focus reflects these regions' critical importance, containing 65% of Indonesia's total generation capacity and serving 57% of the national population (over 145 million people). While climate risks affect all operational areas, the concentration of infrastructure and electricity demand in Java and Bali warranted prioritized assessment to develop targeted mitigation strategies that maintain system reliability while addressing the most significant vulnerabilities.

Physical Risks

The climate risk assessment findings reveal specific impacts across PLN's operations, with detailed effects observed in generation, transmission, and distribution systems as outlined in **Table 1**.

Table 1 PLN's Physical Climate Risk for NZE 2060 Target

Physical Risk	Target	Risk Level	Type of Impact	Treatment Measurement
Power Generation				
Heavy precipitation	Net Zero	Low (4)	Impact on non-renewable assets: 1. Reduced burning efficiency of power plants. 2. Reduced power output of power plants. Reduced water intake capacity Flooding. Impact on NRE assets: 1. Flood damage to ground mounted solar infrastructure. 2. Increased frequency for local grid maintenance.	1. Structural reinforcement. 2. Implementation of flood protection measures. 3. Implementation of emergency response plans. 4. Regular inspections. 5. Diversification of power generation capacity. 6. Diversification of fuel sources. 7. Investments in smart grid technology. 8. Integration of renewable energy.

Physical Risk	Target	Risk Level	Type of Impact	Treatment Measurement
Heavy wind and high sea waves	Net Zero	Low (3)	Impact on non-renewable assets: 1. Reduced power outputs/ shutdowns of power plants.	1. Structural reinforcement. 2. Lightning and storm detection systems. 3. Geographical diversification of assets. 4. Storm surge modeling for offshore assets. 5. Construction of breakwater infrastructure.
Heatwaves/ Heat stress	Net Zero	Low (4)	Impact on non-renewable assets: 1. Reduction of gas turbine, gas, and diesel engines efficiency. Impact on NRE assets: 1. Reduction of solar panel power generation efficiency by 0.5-3% per 1 degree Celsius increase. 2. Reduced lifespan of solar panels.	1. Cooling system maintenance. 2. Derating strategies during heatwaves. 3. Designing operational strategies to minimize the risk of overheating.
Droughts	Net Zero	Low (3)	Impact on NRE assets: 1. Reduced power outputs.	1. Diversification of water sources. 2. Use of treated wastewater for cooling purposes. 3. Construction of a rainwater retention pond.
Sea level rise	Net Zero	N/A	Impact on non-renewable assets: 1. Daily activity disruption for employees. 2. Higher flooding frequency.	1. Elevated coastal power plant sites. 2. Insurance policies for critical assets.
Wildfire	Net Zero	N/A	Impact on NRE assets: 1. Damage to ground mounted solar infrastructure.	1. Vegetation clearance buffer zones. 2. Emergency preparedness plans. 3. Annual disaster response drills.
Sea surface temperature	Net Zero	N/A	Impact on non-renewable assets: 1. Cooling water system efficiency reduction. 2. Higher frequency of jellyfish outbreaks.	1. Climate risk assessment. 2. Integration of ocean temperature with operations. 3. Deepening of intake pipe to access lower temperatures.
Transmission Networks				
Lightning	Net Zero	Low (2)	Power failures and transmission equipment damages.	1. Real-time lightning detection system. 2. Modern lightning arresters.
Heavy wind	Net Zero	Low (3)	Power failures and transmission equipment damages.	1. Structural reinforcement. 2. Vegetation control around distribution lines. 3. Storm detection and shutdown systems.
Flood	Net Zero	Low to Moderate (7)	Damaged equipment and plant shutdowns due to safety reasons.	1. Implementation of flood protection measures. 2. Annual disaster response drills.
Distribution Networks				
Heavy wind	Net Zero	Low to Moderate (7)	Power outages.	1. Structural reinforcement. 2. Vegetation control around distribution lines. 3. Storm detection and shutdown systems.
Heavy precipitation	Net Zero	Low (3)	Power outages	1. Structural reinforcement. 2. Implementation of flood protection measures. 3. Implementation emergency response plans. 4. Regular inspections. 5. Investing in smart distribution technology.

Physical Risk	Target	Risk Level	Type of Impact	Treatment Measurement
Flood	Net Zero	Low (3)	Power outages.	1. Implementation of flood protection measures. 2. Annual disaster response drills. 3. Construction of a distribution substation at an elevation above the highest recorded flood level.
Landslide	Net Zero	Low (3)	Power outages.	1. Landslide risk maps. 2. Infrastructure relocation strategies.

To address identified climate-related vulnerabilities, PLN has categorized risks by impact severity level across all operational domains: power generation, transmission networks, and distribution networks. The most significant climate-related risk factors include:

- Reduced efficiency of thermal and gas power plants due to extreme heat leading to potential capacity impacts during peak demand periods.
- Increased flooding frequency and sediment accumulation, compromising hydropower reservoir capacity while simultaneously increasing and grid infrastructure maintenance requirements.
- Severe storms and strong winds create dual threats, destabilizing transmission networks while causing physical damage to solar panel infrastructure.

Climate-related Transition Risks

PLN climate transition risk assessment employs two primary reference paths in its scenario analysis following the identification of key climate-related vulnerabilities including regulatory changes, market shifts, and technological disruptions. The Business as Usual (BAU) scenario, assumes continued coal dependency at current levels while the the ARED scenario, models a systematic transition toward low-carbon technologies. This dual-scenario approach enables a comprehensive evaluation of PLN's operational and financial resilience by across a range of potential future conditions.

Business as Usual (BAU) scenario

For nearly eight decades, PT PLN (Persero) has played a crucial role in Indonesia's power industry, delivering reliable and affordabe power while driving national economic development. With 75.9 GW of installed capacity serving more than 92.8 million consumers across the nation, PLN provides essential electricity access to over 281.6 million people. PLN's enduring presence represents a critical national asset for Indonesia, which has been developed through decades of strategic investment.

However, as illustrated in **Figure 6**, the Business as Usual (BAU) scenario projections indicate potentially severe environmental consequences from maintaining current operations. PLN's continued on coal-fired power plants could escalate annual carbon emissions by 300-400% reaching approximately 1.057 million tons of CO_2. This trajectory underscores the tension between short-term economic considerations and long-term sustainability imperatives within Indonesia's energy transition landscape.

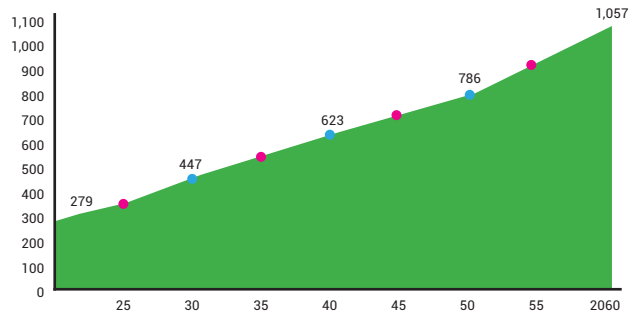


Figure 6 Business as Usual (BAU) Scenario Projections

The BAU scenario serves as an essential benchmark in PLN's comprehensive climate risk assessment. Itunderscores the substantial transition risks inherent in maintaining the status quo without a strategy for energy diversification or decarbonization. As a foundational analytical tool the BAU scenario enables systematic identification of operational and financial exposures within PLN's current business model, directly informing the company's risk prioritization matrix, resilience planning protocols, and strategic transition roadmaps.

Accelerated Renewable Energy Development (ARED)

In contrast to the carbon-intensive trajectory outlined in the BAU scenario, the Alternative Renewable Energy Development (ARED) scenario presents a more progressive decarbonization framework aligned with global energy transition best practices.

The ARED scenario presents a superior emissions performance relative to the BAU Coal/Gas scenario. As of 2024, projections show that PLN's carbon emissions are expected to peak at approximately 326 million tons of CO_2 by 2030. The trajectory continues its downward trend with emissions projected to further achieve NZE by 2060, which are shown in **Figure 7**. ARED's effective performance establishes PLN as a key enabler of Indonesia's nationally determined low-emission development strategy while maintaining energy reliability and affordability.

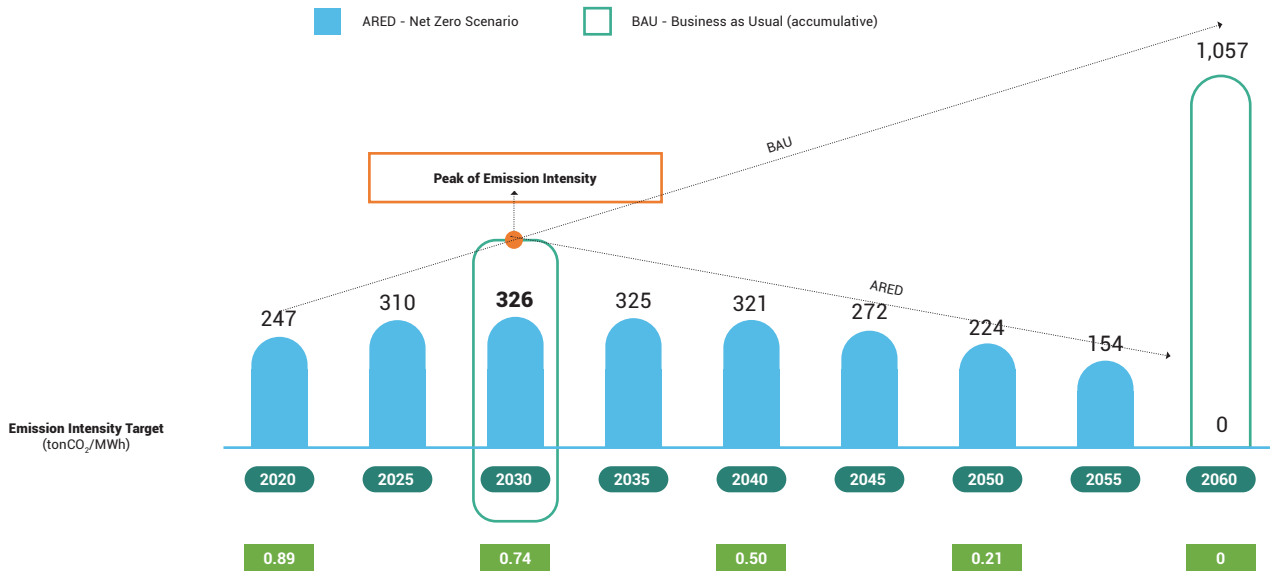


Figure 7 Net Zero Emissions (NZE) Projection

The ARED scenario adopts a measured approach to coal phase-down avoiding early closure of coal-fired power plants (CFPPs) while ensuring alignment with Indonesia's broader decarbonization timeline. This phased approach leverages a combination of decarbonization levers: biomass co-firing for immediate emissions reductions, and planned carbon capture and storage (CCS) deployment longer-term mitigation of residual emissions from remaining thermal assets. The integrated strategy simultaneously addresses four critical transition dimensions: (1) technical, (2) finance, (3) policy and regulation, and (4) just transition. This balanced methodology ensures electricity reliability remains uncompromised while achieving targeted emissions reductions.

Transition Risk

The ARED scenario analysis has enabled the systematic identification and mapping of key transition risks across multiple dimensions, including evolving regulatory frameworks, carbon pricing mechanisms, technological disruptions, and shifting stakeholder expectations. The findings from this comprehensive assessment provide a structured foundation for mitigating potential financial and operational impacts while maintaining progress toward decarbonization objectives, as summarized in **Table 2**.

Table 2 PLN's Transition Climate Risk for NZE 2060 Target

Transition Risk Type	Transition Risk	Risk Level	Treatment Measurement
Financial	Limited Funding for Energy Transition Projects	High (25)	Encouragement of policies that increase investment certainty, including adjustments to fiscal incentives and price certainty for EBT plants, aim to strengthen system interconnection, improve the quality of project proposals, and utilize innovative financing schemes such as PPP, joint ventures, and blended finance mechanisms to expand access to sustainable funding.
	Increase in Electricity Supply Cost in Energy Transition (ARED Scenario)	Moderate (12)	Optimization of operational efficiency through the utilization of renewable energy generation with the lowest Levelized Cost of Electricity (LCOE), as well as selecting energy-efficient and project-appropriate technologies to maintain financial sustainability and tariff affordability.
Technical	Carbon emission reduction program constrained	Moderate (14)	Formulation of breakthrough steps to accelerate the development of NRE plants and efforts to accelerate the fulfillment of funding needs, especially for projects that require additional loan agreements.
	Biomass supply constraints	High (22)	Development of a local economy-based supply chain ecosystem, enhancement of stakeholders' collaboration, and mapping, market research, and trials of various types of biomasses, establishment of location-based procurement schemes, long-term agreements, and strengthening of infrastructure and fuel quality to maintain supply sustainability and system reliability.
Regulatory	The absence of end-to-end guidelines for the implementation of the energy transition in the electricity sector	High (21)	Encouragement of active communication with regulators to accelerate the development of a comprehensive legal framework, ensure harmonization with national planning documents, and benchmarking against international best practices to strengthen the policy direction and implementation of the overall energy transition.
	Licensing and land management barriers for new and renewable energy projects	High (22)	Harmonization of central and regional policies, mapping potential land, and strengthening coordination with local communities. In addition, verify land ownership status thoroughly to minimize legal risks and accelerate the project implementation process.
	Carbon Tax Risk (Non-Allowable Cost)	Moderate to High (18)	Collaboration with legal consultants and tax experts to ensure regulatory compliance while minimizing fiscal burden. In addition, execution of a financial simulation to measure the impact of subsidy reduction and carbon mechanism implementation on the cost structure, which would be used as the basis for precise and measurable budget adjustments.

Transition Risk Type	Transition Risk	Risk Level	Treatment Measurement
Social and Environment	Public resistance to new infrastructure development	High (22)	Application of participatory planning approaches, respect of local cultural values, codify transparency and open communication, provide public education, establish responsive grievance mechanisms, manage environmental impacts sustainably, and form a dedicated function to oversee social aspects comprehensively.
	Social disparities related to the use of new technologies from the energy transition	Moderate (13)	Encouragement of cross-stakeholder collaboration to provide incentives, access to affordable financing, and equitable infrastructure investment, including conducting public education, inclusive programs, and community-based pilot projects to increase acceptance, equitable access, and utilization of sustainable energy technologies at all levels of society.

CLIMATE RISK ADAPTATION

To enhance climate preparedness, PLN formalized its emergency response framework through Director's Regulation No. 0072 of 2021, which establishes standardized emergency response protocols for disaster mitigation, including climate-related risks. This regulation ensures that critical PLN assets are protected against climate hazards while guiding adaptive measures for infrastructure to address growing volatility in energy demand, resource availability, and extreme weather patterns. PLN has also undertaken adaptation measures to address weather-related risks by implementing weather modification techniques, particularly to support hydropower operations. These initiatives are directly executed by PLN's sub-holding.

Integration of Climate Risk Management into Corporate Risk Management

PLN has integrated climate-related risk factors into its existing processes for risk identification, assessment, and mitigation, as shown in **Figure 8**, thereby strengthening our enterprise risk management framework. In accordance with ISO 31000:2018, PLN's enhanced risk management system systematically integrates climate-related physical and transition risks within the three-lines-of-defense framework.

This model ensures that risk control and oversight are integrated at every level of the organization through risk management, supervisory, and assurance activities. The Board of Directors (BoD) is responsible for directly coordinating and supervising the implementation of the risk framework, while the Board of Commissioners (BoC) assesses its effectiveness through the Risk Management Committee.

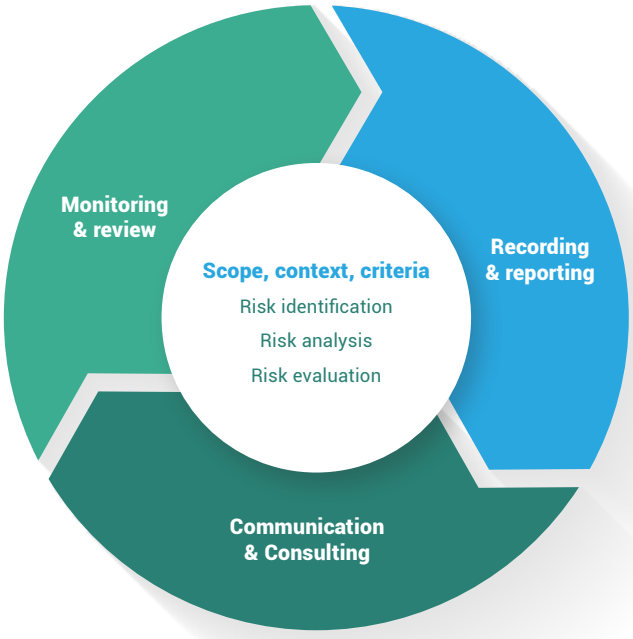


Figure 8 Risk Management Process

The identification and assessment of climate-related risks follow the structured risk management framework as outlined in BoD Regulation No. 0016 of 2023, aligning with PLN's ESG commitments and global best practices. This framework effectively maps and evaluates strategic, financial, operational, and compliance risks. Scenario-based analysis, such as the RCP and ARED scenarios, effectively profiles climate risks, enabling a comprehensive understanding of potential policy, market, and technology changes across different energy transition pathways.

PLN recognizes that effectively managing climate-related risks is essential for safeguarding its assets and operations, ensuring long-term energy resilience, and facilitating the successful transition to a low-carbon economy. As such, climate-related risks are prioritized alongside other critical risk categories, including strategic, financial, operational, and regulatory risks. PLN incorporates these into its risk taxonomy (**Figure 9**) and evaluates their significance through both qualitative and quantitative methods, considering potential financial impacts, likelihood, and alignment with the company's overall risk appetite.

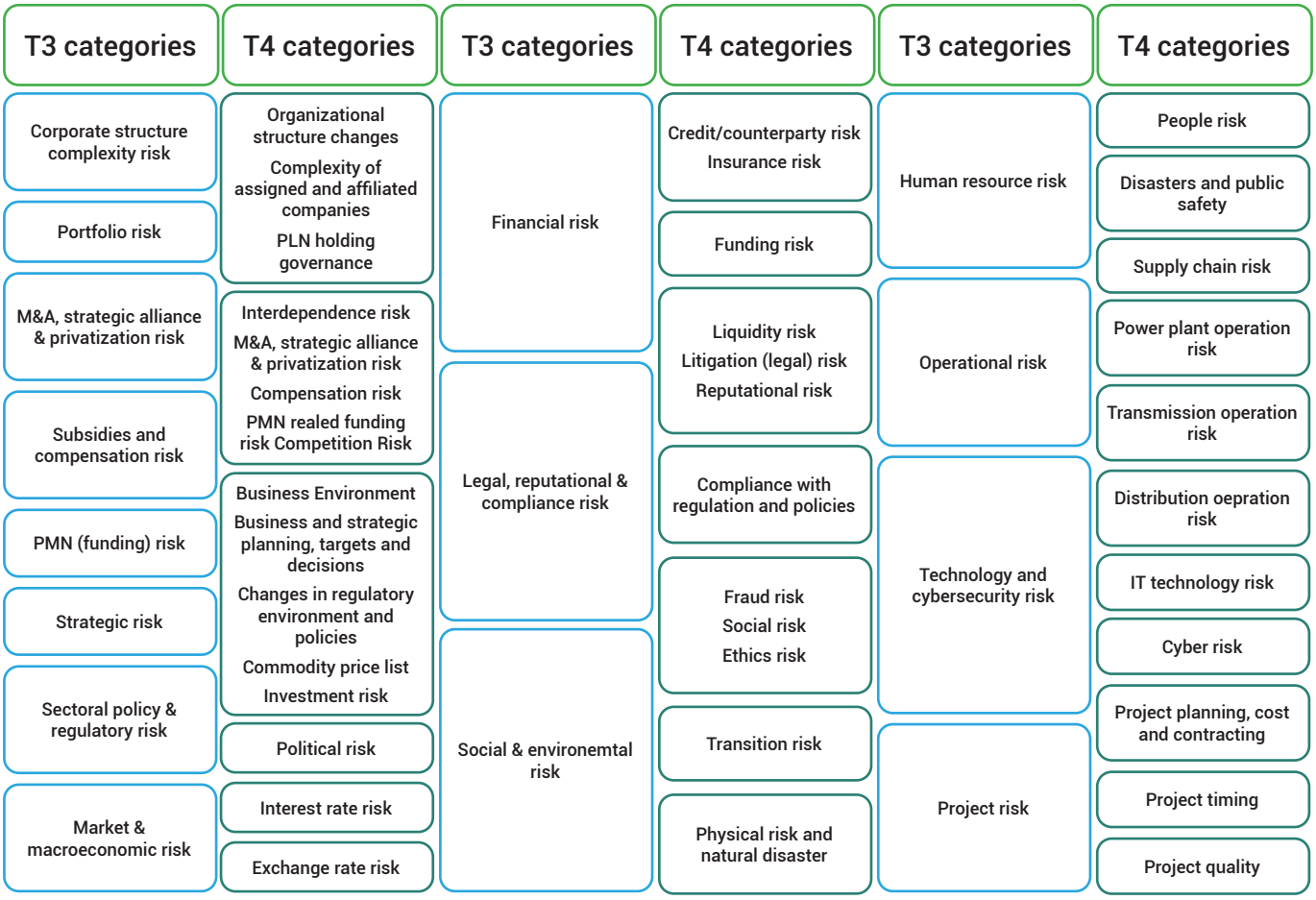


Figure 9 PLN Risk Taxonomy

PLN systematically embeds climate-related risks into its strategic planning and operational decision-making through a standardized risk governance approach. The organization employs defined metrics, including risk capacity, risk appetite, risk tolerance, and risk limits to ensure proactive risk identification and mitigation. This structured methodology, operationalized through PLN's Risk Appetite Framework, facilitates continuous monitoring of risk exposure while enabling data-driven resource allocation. The framework strengthens organizational alignment by establishing clear risk parameters that inform both long-term strategy and day-to-day operations, ensuring climate considerations remain integral to business processes. The framework uses the risk matrix in **Table 3** to evaluate climate-related risks by combining their probability and impact.

Table 3 Risk Level

Probability x Impact		Impact Level				
		Not Significant (1)	Minor (2)	Medium (3)	Significant (4)	Very Significant (5)
Probability Level	Certain (5)	Low to Moderate (7)	Moderate (12)	Moderate to High (17)	High (22)	High (25)
	Likely (4)	Low (4)	Low to Moderate (9)	Moderate (14)	Moderate to High (19)	High (24)
	Even Chance (3)	Low (3)	Low to Moderate (8)	Moderate (13)	Moderate to High (18)	High (23)
	Unlikely (2)	Low (2)	Low to Moderate (6)	Low to Moderate (11)	Moderate to High (16)	High (21)
	Impossible (1)	Low (1)	Low (5)	Low to Moderate (10)	Moderate (15)	High (20)

By embedding climate considerations into its strategy and risk management processes, PLN ensures it maintains operational agility and resilience amid rapidly evolving climate challenges. The organization also implements continuous monitoring mechanisms to assess climate-related risks, ensuring robust energy planning and adaptive infrastructure development. Key components of this approach include:

- Real-time tracking of climate vulnerabilities through environmental monitoring systems.
- Periodic reviews and updates to climate risk mitigation strategies.
- Integration of climate resilience into PLN's energy transition roadmap.

Through these proactive measures, PLN strengthens its adaptive capacity to safeguard energy supply reliability, reduce climate-related operational disruptions, and maintain progress toward Indonesia's NZE 2060 objectives. The integrated approach ensures climate resilience remains central to both near-term operational decisions and long-term strategic planning.

04

PLN CLIMATE-FOCUS STRATEGY

PLN CLIMATE-FOCUSED STRATEGY

NAVIGATING CLIMATE-RELATED OPPORTUNITIES

PLN adopts a dual-focused approach to climate challenges, recognizing that emerging risks simultaneously present strategic opportunities for innovation and value creation. In order to ensure business continuity which balances environmental stewardship with long-term profitability and social responsibility, PLN has identified a range of opportunities arising from the impact of climate change and the company's energy transition strategy. These opportunities are categorized based on aspects that may generate both financial and non-financial benefits for PLN, as outlined below:

1. Energy sources

As the primary electricity provider for the Indonesian population, PLN is well-positioned to capitalize on emerging opportunities in the diversification of energy sources. By expanding its portfolio of renewable energy to better address the evolving needs and preferences of society, PLN also actively contributes to the realization of national energy targets and the advancement of energy decentralization.

2. Resource efficiency

Through efforts to optimize costs and enhance energy efficiency across all lines of PLN's business, a range of opportunities can be leveraged. Initiatives involving technological advancement and improvements in governance are key to unlocking the company's full financial and operational potential.

3. Products and services

Amid growing public awareness of climate change and the accelerating global shift toward a low-carbon economy, demand for clean, efficient, and sustainable energy is rising significantly. In response, PLN identified a strategic opportunity to expand its low-carbon product and service portfolio by deploying a suite of green energy solutions. This builds stakeholder trust and strategic alignment with investor expectations.

4. Markets

Market dynamics are shifting in response to climate change. As a leader in national energy resilience, PLN must adapt to the current market conditions. Recognizing the green economy as a strategic opportunity, PLN is pursuing energy transition targets to help access potential funding and expand global collaboration through green financial instruments.

5. Resilience

With the emergence of many new energy sources, PLN needs to adjust its operational improvements, including human resources and technology in order to apply these new and renewable energy options so that PLN can continue to grow, produce, and distribute electricity throughout Indonesia.

As explained above, the company's integrated transition plan then addresses potential opportunities and how it may benefit the company financially across five critical operational dimensions as shown in **Table 4**.

Table 4 Opportunities Towards Climate-risks

Type	Potential Opportunities	Potential Financial Impacts
Energy Source	• Amplifying new energy sources, such as hydrogen and ammonia. • Expanding the use of natural gas and biofuel to support a more reliable and cleaner energy supply. • Exploring the potential of nuclear energy as a future alternative power source.	• Leverage green investment and forge impactful collaborations. • Reduce carbon compliance costs. • Increase sales of SPE-GRK, generating additional income streams.
Resource Efficiency	• Developing smart power systems into a more efficient, modern, and sustainable network. • Developing Super Grid interconnections to boost energy efficiency, integrate renewables, and accelerate power sector decarbonization. • Amplifying Clean Coal Technology (CCT) to optimize fuel utilization.	• Reduce operating costs. • Reduce carbon compliance costs.
Products and Services	• Expanding low-emission service offerings such as electric vehicle infrastructure and rooftop solar installations. • Scaling up Renewable Energy Certificates (REC) to provide customers with cleaner energy choices. • Improving energy delivery services through smart grid technologies.	• Reduce infrastructure costs and transmission losses, with the adoption of rooftop solar systems and smart grid technologies. • Improve competitive position resulting in increasing revenues. • Increase revenue through higher demand for lower emissions products
Markets	• Developing Renewable Energy Certificates (RECs) to certify 1 MWh of renewable electricity generation. • Establishing two carbon trading schemes: - Certified Emission Reduction (SPE-GRK) as a recognized tool for emission offsetting. - Emission Trading Scheme (ETS) to offset emissions by purchasing surplus allowances. • Access to new and emerging markets through various funding schemes and cross-sector collaborations.	• Increase revenue from emissions offsets or renewable energy incentives. • Increase diversification of financial assets.
Resilience	• Enhancing infrastructure, power system, climate-risk management, and green technologies. • Developing a capacity-building program to equip employees with skills in green energy technologies.	• Long-term operational efficiency. • Enhance employee's productivity, reduce dependency on external experts.

Through this multidimensional approach, PLN positions itself to not only mitigate climate risks but also capitalize on emerging opportunities that drive sustainable value creation across its operations. The organization's systematic framework ensures thorough identification, assessment, prioritization, and ongoing monitoring of these factors through its Sustainability Committee's divisional structure, with progress tracked via the SWR as detailed in the Governance section.

STRATEGIC DECISION-MAKING

Indonesia's energy transition marks a pivotal transformation towards sustainable development and enhanced environmental stewardship. This shift is crucial to not only mitigating climate change impacts but also strengthening national energy security. The successful realization of these ambitious goals requires accelerated adoption of sustainable practices across all sectors, demonstrating Indonesia's commitment to global climate frameworks such as the Paris Agreement while supporting domestic development priorities.

While serving as the backbone of Indonesia's economic growth, the energy sector continues to face significant decarbonization challenges due to its historical reliance on coal-fired generation. Despite possessing substantial renewable energy resources, reducing fossil fuel dependency remains a complex undertaking. In response, PLN has established its NZE 2060 commitment, with a projected peak in CO_2 emissions by 2030 followed by sustained reduction pathways.
PLN's long-term strategic framework positions sustainability as a foundational pillar due to four critical imperatives:

1. Climate risk reshaping business fundamentals – Physical climate impacts and tightening environmental regulations require PLN to adapt its operations and investment planning to ensure long-term resilience.
2. Alignment with national and global climate goals – As a state-owned utility, PLN bears unique responsibility for advancing Indonesia's climate commitments through equitable clean energy deployment and infrastructure modernization.
3. Rising stakeholder expectations – Customers, regulators, and investors increasingly demand climate leadership, social inclusion, and a just transition that empowers communities across the archipelago.
4. Financial resilience – Sustaining infrastructure investment that ensures affordability, and improves environmental performance depends on PLN's ability to maintain long-term financial health.

Sustainability is a strategic imperative for ensuring long-term resilience, aligning with national goals, and meeting stakeholder expectations. In an effort to achieve NZE by 2060, PLN must be able to balance the three interdependent priorities of the energy trilemma: security and quality of supply; environmental and social sustainability; and fair and affordable prices, as illustrated in **Figure 10**. This trilemma framework guides strategic decision-making to ensure sectoral competitiveness, public value creation, and long-term financial stability throughout the energy transition. By maintaining equilibrium across these dimensions, PLN positions itself as both a climate leader and guarantor of Indonesia's sustainable development aspirations.

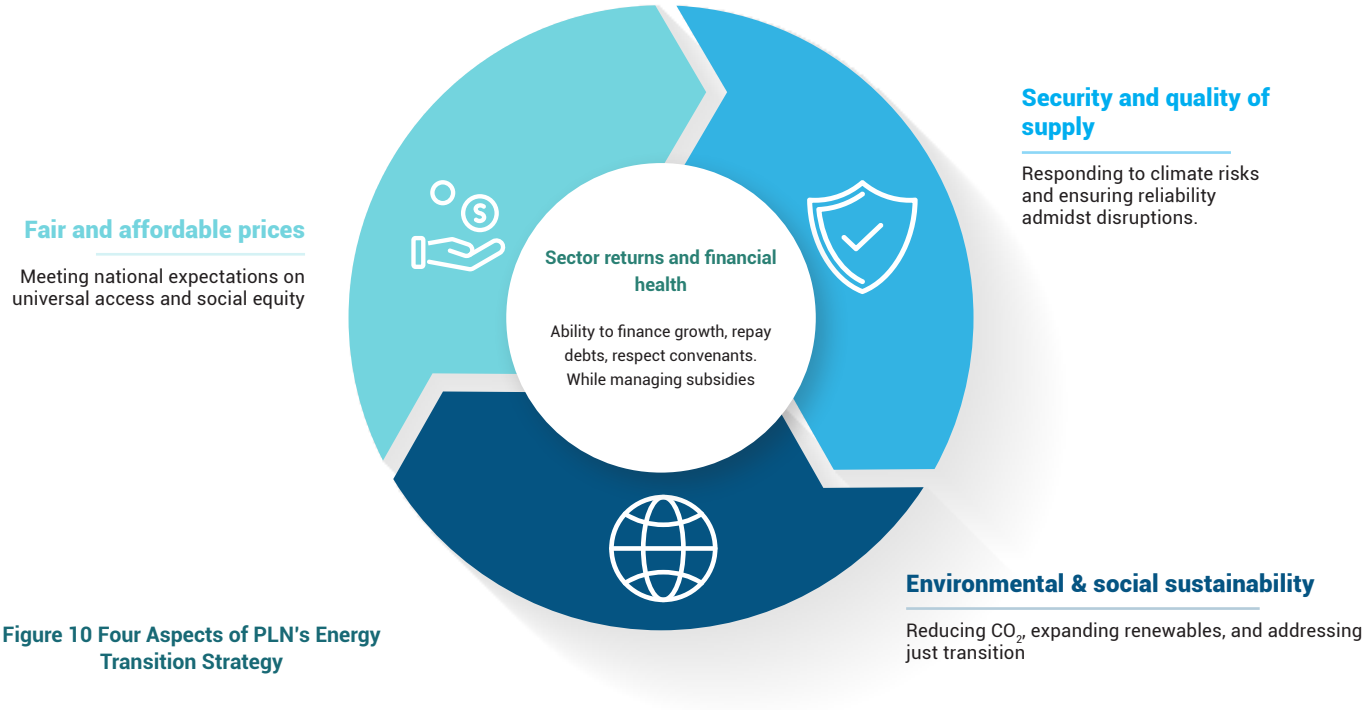


Figure 10 Four Aspects of PLN's Energy Transition Strategy

Our Climate Change Initiatives

PLN has developed a comprehensive "Energy Transition Pillars" strategy to systematically address climate-related risks and opportunities while achieving its NZE 2060 target. This strategic framework is built on three core pillars that collectively drive decarbonization efforts across PLN's operations. The first two pillars focus on transitioning away from high-carbon power generation through phased retirement of fossil fuel assets and accelerated deployment of renewable energy solutions. The third pillar concentrates on developing the necessary technological infrastructure and ecosystem support to enable sustainable energy growth.

Critical to the successful implementation of this strategy are two fundamental enablers: human capital development and financial resource allocation. PLN recognizes that building workforce capabilities through targeted skills enhancement programs is essential to drive innovation and effectively implement sustainable energy solutions. Concurrently, securing adequate funding through strategic financial mechanisms ensures the necessary capital is available to execute the diverse projects and initiatives that underpin PLN's energy transition commitment. Together, these components form an integrated approach to overcoming decarbonization challenges while advancing toward a sustainable energy future.

Our Strategic Decarbonization Initiatives

PLN has adopted a dual-phase timeline for managing climate-related risks and opportunities by short-medium term and long term, as illustrated in **Figure 11**. The short-medium term phase ranges from 2021 to 2030 and is focused on operational adjustments and rapid implementation of projects that contribute to surpassing Indonesia's NDC target. This phase emphasizes practical measures such as renewable energy deployment, grid modernization, and efficiency improvements that deliver measurable emissions reductions within the current decade.

The long-term phase (2031-2060) addresses the structural transformations required to achieve full decarbonization. This extended timeframe accommodates the development and integration of advanced clean energy technologies, complete phase-out of fossil fuel generation, and continuous adaptation to evolving climate scenarios. PLN's initiatives across both time horizons are strategically designed to progressively transition from coal dependency to renewable energy dominance, while maintaining grid reliability and supporting Indonesia's sustainable development objectives. The company remains committed to regularly reviewing and updating its approach to ensure alignment with emerging technological advancements and evolving climate science.

As part of its long-term strategy to support deep extensive decarbonization, PLN is also advancing the development of emerging technologies and new business models. This includes building a supportive ecosystem around electric vehicles, rooftop solar, green energy-as-a-service, carbon trading, and emissions trading schemes. These initiatives are integral to PLN's broader transformation, enabling the Company to not only diversify its energy services but also enhance system resiliency ahead in preparation for a low-carbon future. The success of this strategy hinges on financial strength, developing internal capabilities, and technological mastery, underpinned by continuous innovation, sustainable financing, and an enabling policy environment.

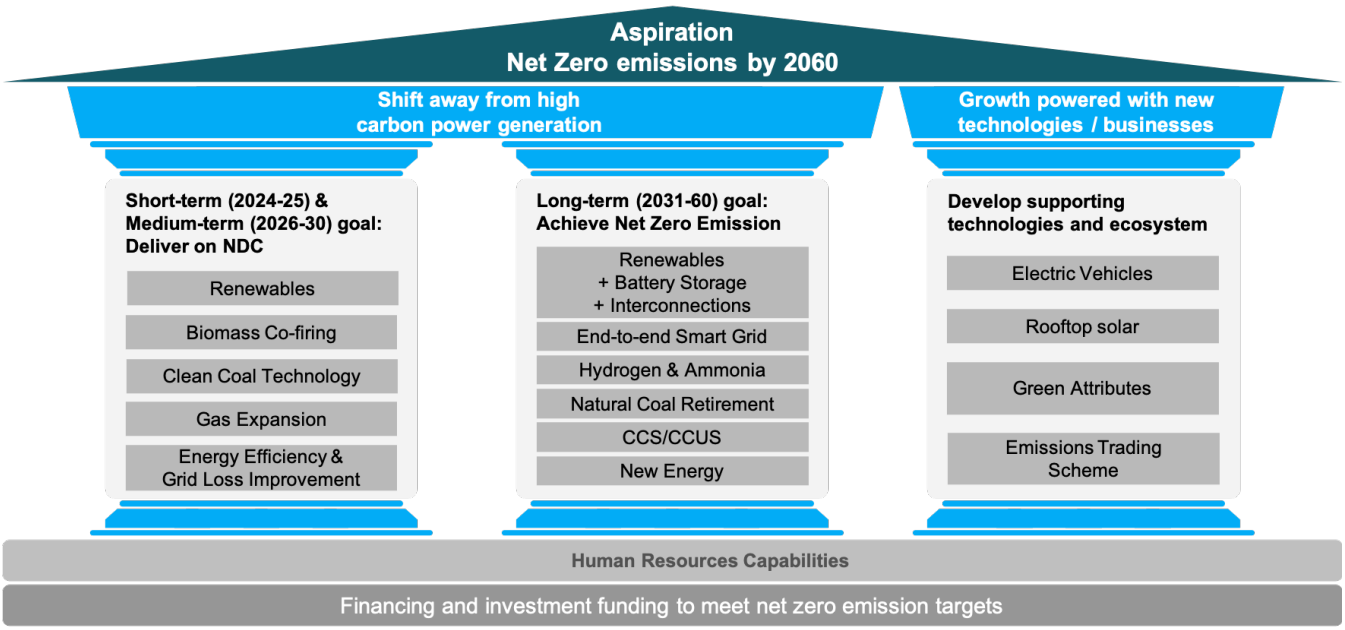


Figure 11 PLN's Pillar of Energy Transition

PLN has established a robust and multi-dimensional approach to achieve NZE 2060, addressing Scope 1, 2, and 3 emissions across its entire value chain. This comprehensive strategy encompasses generation, transmission & distribution, and retail operations, aligning with Indonesia's national decarbonization objectives through renewable energy integration, technological innovation, and operational optimization.

Scope 1 Initiatives: Reducing Direct Emissions

PLN is implementing a diversified portfolio of solutions to mitigate direct emissions from owned and controlled sources. The generation sector is transitioning through renewable energy deployment, biomass co-firing in existing plants, and exploration of hydrogen and ammonia applications. The company is also evaluating CCS technology as an alternative for remaining thermal assets, while energy efficiency measures are being implemented across all facilities. The company is assessing nuclear energy as a potential long-term baseload solution, complemented by smart grid implementation and battery storage integration to enhance system flexibility. Finally, the company has been exploring a measured gas expansion program which would serves as a transitional solution, alongside continued improvements in clean coal technology.

Scope 2 Initiatives: Reducing Indirect Emissions from Purchased Electricity

The transmission and distribution sector plays a critical role in reducing indirect emissions through substantial grid modernization efforts. PLN is prioritizing infrastructure upgrades to minimize technical and non-technical losses, implementing advanced monitoring systems, and optimizing power flow management. These measures not only reduce the carbon intensity of purchased electricity but also improve overall system reliability and efficiency, creating a more resilient foundation for renewable energy integration.

Scope 3 Initiatives: Addressing Value Chain Emissions

Recognizing that a large portion of emissions extend beyond direct operations, PLN has implemented an extensive Scope 3 reduction program. This includes accelerating renewable energy partnerships, expanding rooftop solar programs, and supporting electric vehicle infrastructure development. The company is actively participating in green certification schemes and emission trading platforms to incentivize broader sectoral decarbonization. Smart grid expansion and battery storage development further enable the integration of distributed energy resources.

Sector-Specific Emission Reduction Initiatives

PLN's decarbonization efforts are structured across three key business sectors:

1. Generation Sector: Implementing energy efficiency measures and expanding battery storage to support the transition towards cleaner power generation, including renewable energy deployment, biomass co-firing, hydrogen and ammonia, CCS technology, and nuclear as a long-term baseload solution.
2. Transmission & Distribution Sector: Strengthening grid interconnections and deploying smart grid technology to enhance energy distribution and efficiency.
3. Retail Sector: Promoting electric vehicle adoption, rooftop solar installations, green attributes, and participation in emission trading schemes.

Through this integrated, three-scope approach, PLN is positioning itself not just as a participant in Indonesia's energy transition, but as a catalyst for system-wide decarbonization. The strategy balances immediate action with long-term transformation, ensuring both environmental integrity and energy security throughout the transition period. Regular monitoring and adjustment mechanisms are embedded to maintain progress toward the 2060 NZE target while responding to evolving technological and regulatory landscapes.

CLIMATE-RELATED EFFECTS ON BUSINESS MODEL AND VALUE CHAIN

Implementation Strategy

PLN has set company-wide renewable energy targets for the short to medium term (through 2030) and the long term (through 2060). The implementation of these targets is delegated to specific sub-holdings, each responsible for driving key initiatives. PLN Nusantara Power (PLN NP) and PLN Indonesia Power (PLN IP) play pivotal roles in this transition, particularly through their focus on electricity generation, which is central to advancing PLN's renewable energy agenda.

Based on the ARED scenario, PLN has created a long-term roadmap for transforming Indonesia's energy landscape. The cornerstone of this strategy involves scaling up renewable energy (RE) capacity to 61 GW, making up 75% of the generation mix, with baseload hydro and geothermal plants forming the foundation of this expansion. Complementing this renewable growth, PLN will strategically develop 20 GW of gas-fired capacity to ensure system reliability during the transition period. By 2040, PLN's generation portfolio is projected to achieve a balanced mix of 33 GW from stable baseload renewables and 28 GW from variable renewable energy (VRE) sources, primarily solar and wind power. The plan also incorporates progressive adoption of advanced energy solutions, including 2.4 GW of nuclear capacity, reflecting PLN's commitment to diversifying its clean energy portfolio.

By 2030, PLN aims to increase the share of renewable energy in its capacity mix to 51.6%, equivalent to 20.93 GW of capacity. The target includes:

- 10.4 GW from hydroelectric plants
- 3.4 GW from geothermal plants
- 4.7 GW from solar photovoltaic plants
- 1.8 GW from other renewable sources
- 0.6 GW from bio-source

ESG principles are embedded into short-medium term and long-term initiatives. Short-medium term initiatives are focused on accelerating progress toward Indonesia's NDC target by 2030. In the long term, PLN's strategy aims to achieve Net Zero emissions by driving systemic transformation and deep decarbonization across its entire value chain.

Energy Transition Performance 2024

Smart Grid Technology

The Smart Grid has become a critical necessity to address the growing challenges of integrating Variable Renewable Energy (VRE) in Indonesia. As an innovation centered on the end-to-end digitalization of the electricity system, the Smart Grid enables the integration of diverse renewable energy sources while ensuring reliable electricity delivery to consumers, as illustrated in **Figure 12**. By implementing Smart Grid technologies, PLN can effectively manage the intermittency and low inertia characteristics of VRE, thereby ensuring a stable and dependable power supply. Without a Smart Grid, the volume of VRE that can be integrated into the electricity system will fall short of planned targets. Therefore, to build a resilient inter-island interconnection system, significant investment grid digitalization and the of Smart Grid infrastructure is essential.

PLN is currently assessing the development of a comprehensive end-to-end Smart Grid, encompassing key components including smart power plants, smart transmission, smart distribution, and smart control systems. The objective is to transform PLN's 24 power systems into a more efficient, modern, and sustainable network, covering both upstream and downstream operations.

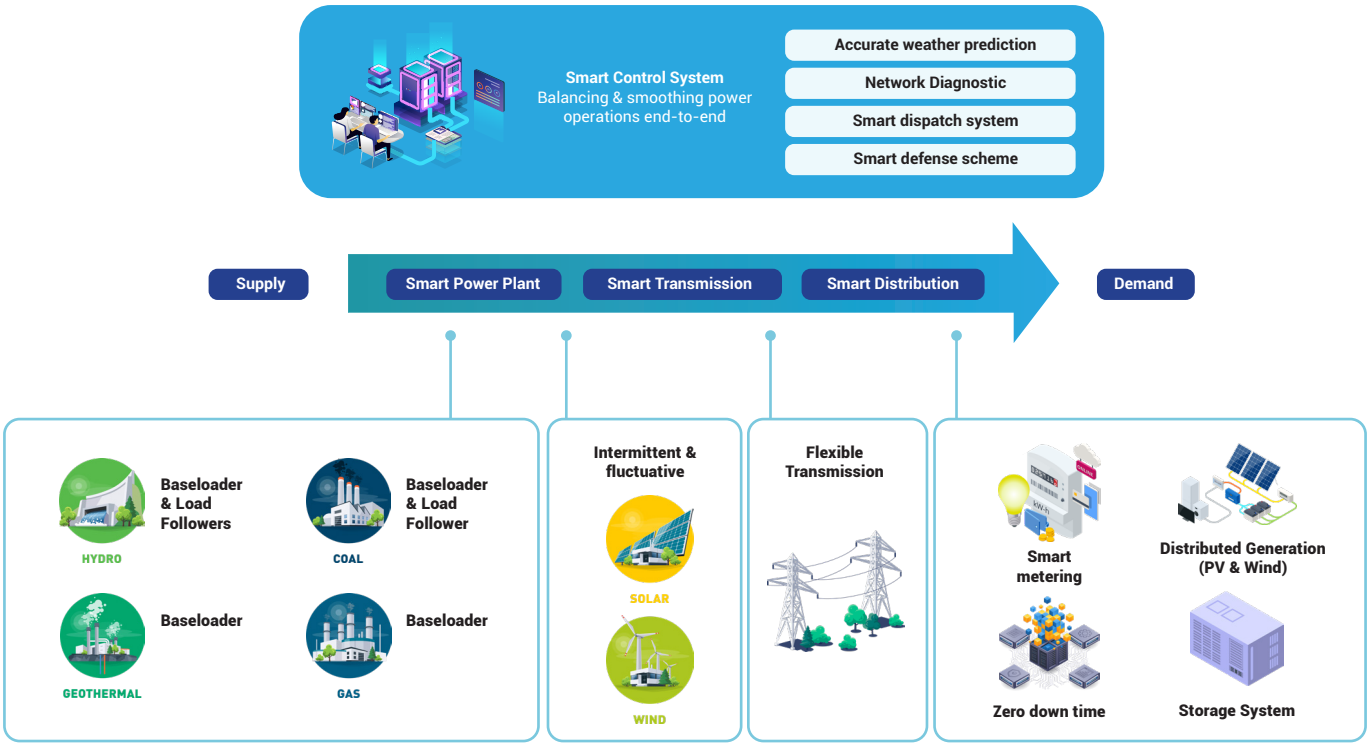


Figure 12 Smart Grid

Advanced Metering Infrastructure (AMI)

The study titled "Framework Development and Strengthening the Implementation of Advanced Metering Infrastructure (AMI)" done by PLN aims to develop a comprehensive framework that will enhance both the ongoing and future phases of AMI implementation. This framework is intended to serve as a reference for AMI deployment across PLN's operational areas to ensure consistency, scalability, and alignment with strategic objectives. The implementation of AMI is positioned as a key enabler in achieving Indonesia's Net Zero Emissions (NZE) 2060 target. This approach emphasizes both direct benefits, such as loss reduction, and indirect benefits, such as enabling carbon emission reductions. Future AMI development will prioritize PLN's R2/R3 residential customer segments, which typically consist of higher-income households, education levels, and potential to adopt rooftop solar and home EV charging. Based on 2023 progress, PLN UID Bali is proposed as a "smart island" with full AMI coverage, while Nusa Penida may serve as an "iconic island" using 100% renewable energy. By 2031, 16 million PLN customers are expected to adopt AMI, with a total rollout and O&M cost of IDR 26.8 trillion. The most beneficial implementation scenario involves AMI procurement funded by the government, procurement led by PLN and its sub-holdings, third-party installation, and operations and maintenance handled by subsidiaries.

Battery Energy Storage System (BESS)

PLN is currently conducting a study to establish the roadmap for BESS implementation in Indonesia. In line with the PLN's Renewable Energy Expansion, the increasing of RE to the system need to be balanced with additional reserve due to its variability. Energy storage offers a strategic alternative to traditional gas-based generation, providing timely and flexible response to fluctuations in supply and demand. As one of the most promising storage solutions, batteries will play a critical role in enhancing grid stability amid growing renewable energy penetration. The deployment of BESS across PLN's network will support the Company's commitment to building a greener, more resilient electricity system, helping to secure a sustainable energy future for Indonesia.

Smart Control Center JAMALI

In 2024, PT PLN (Persero) reaffirmed its commitment to supporting the national energy transition through the development of the Smart Control Center JAMALI (Java, Madura, Bali). This facility serves as the main control center managing approximately 70% of Indonesia's power generation capacity, serving over 160 million residents in the region.

As part of the effort to achieve the target of 23% renewable energy in the primary energy mix by 2025, PLN, together with the Southeast Asia Energy Transition Partnership (ETP), is modernizing the JAMALI Control Center. This modernization includes the integration of advanced technologies such as the Automatic Dispatch System (ADS), Advanced Power System Analysis (APSA), Smart Loading Microgrid (SLM), Integrated Security Operations Center (ISOC), and Enterprise Information System (EIS).

This transformation enables the JAMALI Control Center to manage the integration of variable renewable energy sources, such as solar and wind, which previously posed challenges due to their intermittent nature. With this new capability, the control center can ensure the reliability of electricity supply, operational efficiency, and flexibility in facing fluctuations in energy demand and supply. With this strategic move, PLN not only enhances its operational performance in 2024 but also strengthens the foundation towards a cleaner, more reliable, and sustainable energy system, in line with the Net Zero Emissions vision by 2060.

Super Grid Technology

The Green Enabling Super Grid is a strategic solution designed to address a key challenge in Indonesia's energy transition, the geographic mismatch between abundant renewable energy resources and major load centers. Renewable energy sources like solar, wind, hydro, and geothermal are often located in remote areas, far from the regions where electricity demand is highest. To overcome this, the development of Super Grid interconnections and the strengthening of the national power grid backbone are essential. These interconnections enable the efficient long-distance transmission of electricity from renewable generation sites to key load centers, supporting a more balanced and flexible energy system. The implementation of this system improves overall energy distribution efficiency and enables the broader integration of renewable energy into the national grid, accelerating the decarbonization of the power sector.

Strengthening the power grid backbone is also a critical component of the ARED strategy. By reinforcing transmission infrastructure, PLN can ensure that renewable energy is delivered efficiently, reliably, and at scale to areas with high demand. This is particularly important for supporting long-distance energy transmission, especially given that renewable sources are often located far from areas of high demand.

The intermittent nature of VRE sources like solar and wind necessitates PLN's investments in the development and deployment of an end-to-end smart grid infrastructure and flexible generation systems to support large-scale VRE integration, as shown in **Figure 13**. Flexible generation will primarily be provided by gas-powered plants, ensuring grid stability by compensating for load variations and fluctuations associated with high VRE penetration. Without the implementation of a smart grid and flexible generation, VRE integration would be constrained to approximately 5 GW due to technical limitations like risk of system instability and disruption. Hence, these developments are critical to ensure stability and reliability across the system.

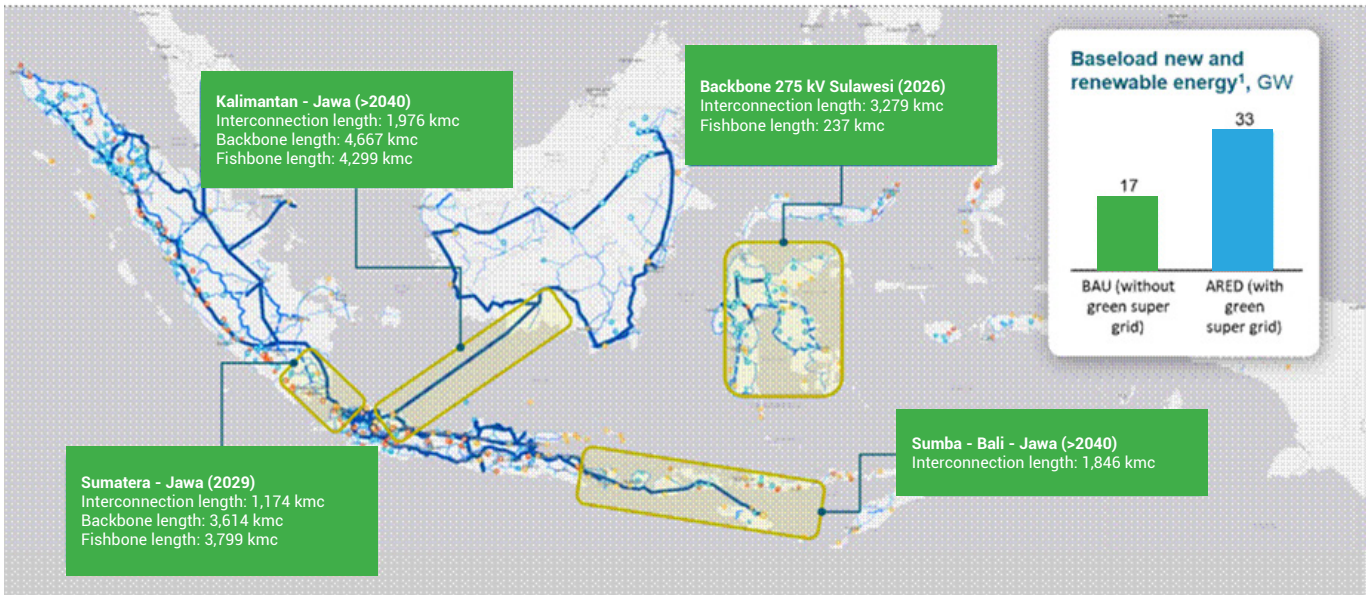


Figure 13 Transmission Expansion & End-to-end Super Grid

In order to support its short-medium term and long-term target, PLN has conducted several initiatives based on the Energy Transition Pillars.

The ARED scenario requires a robust and flexible transmission system to ensure efficient electricity distribution and optimize variable renewable energy (VRE) integration while maintaining grid stability PLN's Smart Grid system employs advanced information technology and smart communication systems to ensure the grid capability amidst the introduction of an increasing proportion of renewable energy The initiative enhances system flexibility, reliability, and renewable energy absorption capacity. PLN has identified several ways strategic partnerships can accelerate this transition:

1. PLN's Control Center Development Study (with the U.S. National Renewable Energy Laboratory (NREL))
   This study focuses on the integration of Sulawesi, Kalimantan, and Sumatra grid to unlock regional renewable energy potential and improve electricity distribution efficiency.
2. PLN's Smart Grid Technology Development (with Egypt's Elsewedy Electric)
   This collaboration introduces and integrates smart meters and grid stabilization solutions to mitigate renewable intermittency and weather-induced disruptions, improving outage response and energy efficiency.
3. PLN's Transmission Grid Interconnection (with TAQA)
   This partnership focuses on strengthening inter-regional power flow to balance supply-demand mismatches exacerbated by climate variability, serving as a crucial adaptation strategy.
4. PLN's Smart Grid Innovation: SEAPOWER
   Beyond international collaborations, PLN's sub-holdings and subsidiaries continue to demonstrate innovative operational technologies. One notable example is PLN Nusantara Power's (Sea Environment Analytic & Prediction for Power Plant (PLN SEAPOWER)) initiative which utilizes AI-driven seawater monitoring at, developed by PLN Nusantara Power (PLN NP) for Muara Karang Combined Cycle Power Plant (CCPP).

   This technology was designed to minimize the reliance on fossil fuel power plants by predicting seawater conditions and detecting anomalies, like marine debris to prevent turbine damage or other impacts on which can affect power plant operations. By preventing steam turbine damage, SEAPOWER improves energy efficiency and reduces shutdown risks, directly lowering emissions by reducing fossil fuel reliance.

Expansion of Renewable Energy Generation Capacity

PLN is executing a substantial renewable energy development program as part of its RUPTL 2021–2030 plan, targeting an additional 20.9 GW of renewable energy to advance Indonesia's energy transition, as shown in **Figure 14**. In 2024, PLN completed the creation of new renewable power plants totaling an additional capacity of 480 MW. This includes the Asahan #3 Hydro Plant, Jatigede Hydro Plant, and IKN Solar Plant (10 MW), all of which are operational and reduce PLN's total carbon emissions. These operational facilities are currently contributing to PLN's carbon reduction efforts while enhancing regional energy security. As of December 2024, the project pipeline shows strong momentum with 105 renewable energy projects totaling 3.4 GW capacity in active construction phases across multiple technology types. PLN's PMO Division regularly monitors progress and addresses challenges through the IWR and BoD input.

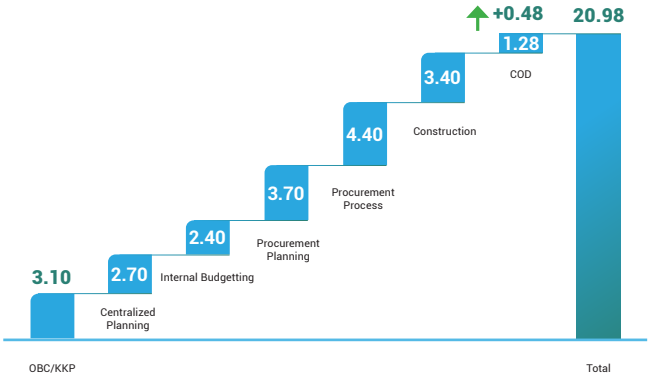


Figure 14 PLN's Renewable Energy Development Target

As of 2024, renewable energy development under the RUPTL 2021–2030 plan has only reached 25% of the 5.09 GW target, highlighting a significant gap, as shown in **Figure 15**. This substantial implementation gap led to the establishment of the IWR as a dedicated governance mechanism to enhance project monitoring from initial planning to Commercial Operation Date (COD). With an ambitious 2025 target of 10.6 GW additional renewable capacity PLN recognize the critical need for operations to intensify development efforts focused on addressing delays and accelerating development.

Despite adding 480 MW of renewable energy in 2024, the energy mix has declined due to rising electricity demand outpacing renewable energy growth and increasing reliance on coal plants. Urgent measures are needed to meet targets, reduce emissions, and ensure a more sustainable energy supply amidst growing demand.

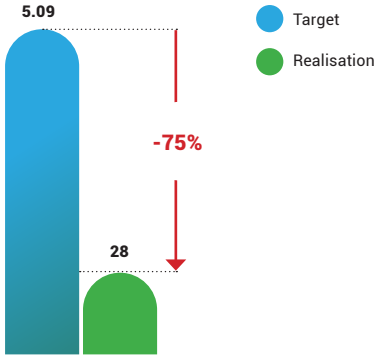


Figure 15 Target and Realization of Cumulative Renewable Energy Development up to 2024

Biomass Co-Firing

Under the Ministry Energy and Mineral Resources (MEMR) Regulation No. 12 of 2023, biomass demand in Indonesia is projected to reach its peak at 10.2 million tons by 2025 as PLN's 52 coal plants integrate biomass into their operations. This demand is expected to decline to 8.91 million tons by 2030, in alignment with Indonesia's E-NDC target of reducing GHG emissions by 32% independently or by 43% with international support.

The program demonstrated strong growth momentum in 2024, with biomass consumption reaching 1.62 million tons - a 70% year-over-year increase from 2023's 0.99 million tons. Despite falling short of the 2.2 million ton annual target, the adjustment of the biomass ceiling price to 1.2 times the coal reference price is expected to significantly improve feedstock availability and utilization rates moving forward.

Implementation faced initial hurdles when biomass costs were excluded from the Levelized Cost of Electricity (LCOE) calculation framework. This barrier was resolved through a September 2024 Focus Group Discussion (FGD) involving key stakeholders, culminating in Ministry of Finance approval for including biomass co-firing costs in the Basic Cost of Electricity Supply (BPP). This regulatory alignment enables full implementation of MEMR Regulation No. 12/2023 provisions and provides financial certainty for continued program expansion.

The biomass program represents a critical transitional solution for PLN, delivering immediate emissions reductions while maintaining grid reliability. With the regulatory framework now stabilized and price mechanisms adjusted, PLN is positioned to accelerate co-firing implementation to meet 2025 targets. PLN's biomass co-firing achievement as December 2024 as shown in **Figure 16**.

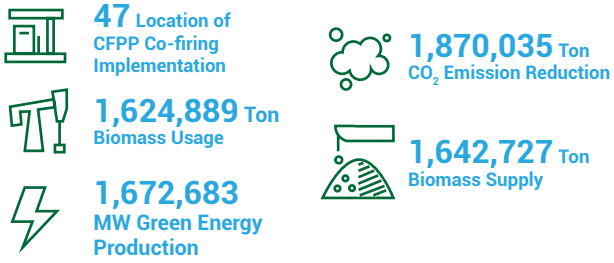


Figure 16 PLN's Biomass Co-Firing Achievement as of December 2024

To meet the MEMR's 2025 targets PLN must work in tandem stakeholders in tandem. This requires strengthening biomass feedstock procurement through long-term agreements with certified suppliers and the development of regional distribution hubs to enhance logistical efficiency. Concurrently, PLN is deploying advanced co-firing systems across its coal fleet, including pilot programs testing higher biomass ratios and specialized combustion technologies, while ensuring compliance through real-time emissions monitoring.

Policy coordination remains critical to the program's implementation. PLN is working closely with MEMR and other government agencies to refine regulatory framework, including biomass quality standards, pricing mechanisms, and permitting processes. These efforts are complemented by strategic partnerships with agricultural producers, research institutions, and local communities to develop sustainable supply chains and optimize feedstock utilization. By fostering cross-sector collaboration, PLN aims to transform its biomass co-firing program into a regional model for pragmatic decarbonization, demonstrating how existing infrastructure can be adapted to reduce emissions while maintaining energy security. Regular progress assessments through the SWR ensure accountability and alignment among all stakeholders, positioning Indonesia to achieve its 10.2 million ton biomass target and advance its NDC commitments. This initiative underscores the importance of integrated planning and cooperation in navigating the complexities of the energy transition. The PLN's cumulative biomass usage as December 2024 as shown in **Figure 17**.

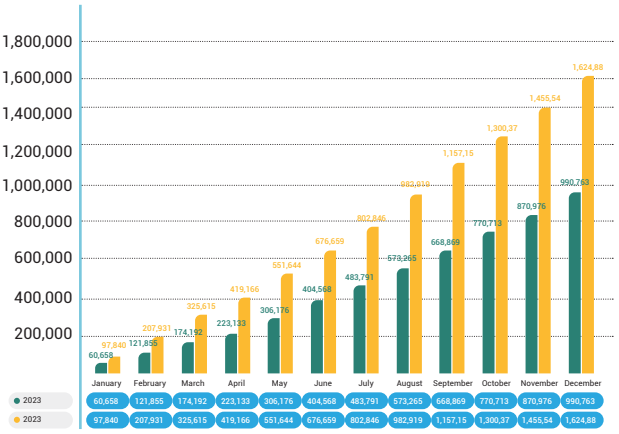


Figure 17 Cumulative Biomass Usage Graph (Ton) y.o.y. as of December 2024

Biofuel

PLN's biofuel initiative has demonstrated consistent growth in reducing CO_2 emissions, contributing significantly to Indonesia's energy transition. In 2024, the biofuel program achieved a reduction of approximately 1.94 million tons of CO_2, up from 1.68 million tons in 2023 and 1.48 million tons in 2022. Biofuels are utilized in various PLN power plants, including Steam Power Plants, Diesel Power Plants, and Gas Engine Power Plants, thereby broadening the application of renewable fuels across PLN's generation fleet. The 2024 achievements underscore PLN's strategic role in advancing renewable energy integration and meeting national decarbonization targets.

Clean Coal Technology (CCT)

PLN's NZE roadmap demonstrated significant progress in 2024, surpassing its initial emissions reduction of 6.06 million tons of CO_2, by achieving a total reduction of 13.9 million tons. A key contributor to this success was the operation of the JAWA 9 and JAWA 10 power plants, which employ ultra-supercritical (USC) technology to maximize thermal efficiency and ultimately contributed to 44.1 million tons of these CO_2 reductions. These plants, with a combined capacity of 2,000 MW, operate at higher temperatures and pressures, which significantly reduces coal consumption and emissions.

Gas Expansion

PLN's Gas Expansion initiative exceeded its 2024 emissions reduction target of 0.97 million tons of CO_2, delivering 2 million tons in reductions. The CCGT Cilamaya Jawa 1 plant, with a capacity of 1.760 MW, played a pivotal role in this success by leveraging its ability to achieve thermal efficiency of up to 65%, by optimizing natural gas use while playing a crucial role in Indonesia's decarbonization efforts.

Energy Efficiency and Grid Loss Improvement

PLN has made substantial progress in improving energy efficiency and reducing transmission and distribution (T&D) losses, which declined from 9.91% in 2013 to 8.55% in 2024. This improvement was driven by grid infrastructure upgrades, advanced monitoring systems, and operational optimizations, enhancing overall system reliability and sustainability. By minimizing energy losses, PLN not only reduces emissions but also strengthens the financial and operational efficiency of Indonesia's power sector.

These achievements demonstrate PLN's commitment to a balanced and pragmatic energy transition, integrating high-efficiency fossil fuel technologies, gas expansion, and grid modernization to meet near-term emissions targets while advancing toward long-term NZE goals. Continued investment in these areas will be essential to sustain momentum and ensure alignment with Indonesia's national decarbonization objectives.

Green Business Strategy Performance

Electric Vehicles

PLN has developed a comprehensive national electric vehicle charging station (SPKLU) infrastructure through strategic partnerships with 39 partners. The network currently consists of 3,233 charging machines across 2,192 locations designed to support widespread EV adoption and maintaining the national target of a 22:1 ratio of 4-wheel EVs to SPKLU machines. As part of this initiative PLN has focused on equipping parent and service unit offices with SPKLU points, driving the country's transition to cleaner energy.

The program has demonstrated remarkable growth, with SPKLU transactions in 2023 quadrupling compared to 2022 figures. Energy consumption through these charging points increased 5.6-fold during the same period. By 2024, EV charging energy usage reached 360% of 2022 levels, reflecting the rapid expansion of Indonesia's electric mobility ecosystem and validating PLN's infrastructure investment strategy.

Rooftop Solar

PLN's rooftop solar initiative has shown consistent growth over the past five years, with 9,928 customers connecting to the on-grid network by December 2024, representing approximately 328 MWp of installed capacity. Following the implementation of the MEMR Regulation No. 2 of 2024, PLN has further an accelerated simplified interconnection process through a streamlined permit and application process via the PLN Mobile app. This streamlined approach has proven highly effective, with 88% of the 2024 allocation (565 MWp) already utilized. The strong uptake demonstrates growing consumer interest in distributed renewable energy solutions and PLN's successful efforts to reduce bureaucratic barriers to clean energy adoption. The program contributes significantly to Indonesia's renewable energy targets while empowering consumers to participate actively in the energy transition.

Renewable Energy Certificate (REC)

Renewable Energy Certificates (REC) are tradable instruments that certify the generation of one megawatt-hour (MWh) of electricity from renewable sources. By purchasing RECs from PLN, customers can claim support for renewable energy, as each certificate represents the addition of clean electricity to the national grid, helping drive the transition to a more sustainable energy system. As of June 2024, PLN had certified eight renewable energy power plants, including geothermal and hydro, for REC issuance. These registered facilities have contributed a total of 10.9 TWh of clean energy with 8.28 TWh of RECs sold. REC sales have reached 10.99 TWh by December 2024, generating IDR390.29 billion, with strong uptakes from regions like Banten, West Java, East Java, Central Java, and Jakarta, as shown in **Table 5**. PLN has set a target to sell 15,930 GWh of RECs by 2028. As of December 2024, the program has already made significant progress toward this goal. The strong performance indicates robust market acceptance and positions PLN to potentially exceed its 2028 target if current growth trends continue.

Table 5 REC Issuance 2020 - 2024

Period	REC Issuance (A) (TWh)	REC Sold (B) (TWh)	REC Stock (A-B) (TWh)
Oct - Dec 2020	0.08	0.0009	0.07
Jan - Dec 2021	0.31	0.31	0.0005
Jan - Dec 2022	2.29	1.76	0.53
Jan - Dec 2023	4.00	3.54	0.46
Jan - Dec 2024	6.42	5.38	1.04
Total	13.10	10.99	2.10

Carbon Trading

In addition to the REC program PLN has implemented carbon trading through 2 schemes:

a. Certified Emission Reduction (SPE-GRK)
   The first scheme is the Certified Emission Reduction (SPE-GRK) which serves as a recognized instrument for offsetting emissions, with each unit representing a reduction of 1 ton of CO_2e. This market-based instrument enables entities that exceed their emission caps to fulfill compliance obligations through the acquisition and retirement of SPE-GRK credits. The program maintains rigorous verification standards, requiring independent verification of Mitigation Action Plan Documents (DRAM) and Mitigation Action Progress Reports (LCAM), to ensure integrity and alignment with national mitigation targets.

By the end of 2024, PLN successfully met its SPE-GRK issuance targets, completing certification for four emission reduction projects with one additional ongoing project. Through five powerplants PLN has registered total of 4.9 million tons of CO_2e of SPE-GRK in the National Registry System (NRS) and Indonesia Carbon Exchange (IDX Carbon) through Combine Cycle Power Plants and Mini Hydro Power Plant, as shown in **Table 6**. This carbon credit could be monetized to create a valuable revenue stream for PLN's emission reduction projects while providing regulated entities with credible offset instruments to meet their compliance obligations.

Table 6 Project-Based GHG Emission Reductions and Transactions (SPE)

		2024	2023
(SPE-GRK) Issuance			
PLTGU Muara Karang	Million tons CO_2e	-	0.93
PLTMH Gunung Wugul	Million tons CO_2e	0.012	-
PLTGU Muara Tawar Blok 2	Million tons CO_2e	0.034	-
PLTGU Priok Blok 4	Million tons CO_2e	2.72	-
PLTGU Grati Blok 2	Million tons CO_2e	1.24	-
(SPE-GRK) Sales			
Direct Trading	Million tons CO_2e	0.002	-
IDX Carbon	Million tons CO_2e	0.039	0.011
Summary			
(SPE-GRK) Issuance	Million tons CO_2e	4.01	0.93
(SPE-GRK) Sold	Million tons CO_2e	0.042	0.011

b. Emission Trading Scheme (ETS)
   In Indonesia, power plants exceeding emission limits are required to offset their emissions by purchasing surplus emissions. The first phase of carbon trading within ETS scheme under the PLN Group involved 78 participants from coal fired power plants across 30 locations in Indonesia covering units from Indonesia Power, Nusantara Power, and PLN Holding. Each participant submitted a Monitoring Emission Plan in order determine emissions allowances annually by the MEMR.

In 2024, the emission allowance for the PLN Group (PTBAE-PU) was set at approximately 119.39 million metric tons of CO_2e, in PLN units. This was supplemented by a carryover allocation of around 2.5 million metric tons of CO_2e from the previous year, bringing the total available allocation for the year to approximately 121.85 million metric tons of CO_2e.

PLN Group has positioned carbon units as a strategic product diversification opportunity. By integrating carbon trading into its business model, PLN can support other industries in achieving their net-zero commitments while generating additional revenue streams.

Enabling Policies for Operationalization of PLN Climate Strategy

To support the PLN climate strategies, PLN also has implemented 13 policies based on the following three regulations:

1. Director's Regulation No. 0161 of 2021 concerning Strategic Policy on Climate Change Management.
2. Director's Decisions No. 0322 of 2024 concerning the Formation of the Sustainability Committee at PT PLN (Persero).
3. Director's Circular No. 0025 of 2022 concerning the Standard Procedure for GHG Emission Management.

The 13 policies are focused on maintaining PLN assets and business processes' resilience against the impacts of climate change, namely:

- Control and manage climate change.
- Integrate all climate-related risks and opportunities into PLN's business processes, strategies, and financial planning.
- Reduce GHG emissions and manage climate change issues by managing risks across technical, legal, financial, sourcing, and information technology domains.

- Integrate and optimize energy transition scenarios by creating mitigation strategies and climate change adaptation strategies.
- Develop new and renewable energy sources like solar, wind, hydro, geothermal, and other green energy sources according to future technological developments.
- Increase business beyond kWh through GEAS options like RECs, emission reduction certificates, green tariffs, and a renewable integrated grid.
- Reduce vulnerability to the impacts of existing and future climate crises by mapping the risks associated with climate change.
- Encourage cooperation with national and international stakeholders to achieve sustainable development goals and address the challenges of climate change.
- Reduce deforestation and increase reforestation.
- Report on climate change-related risks and opportunities to increase the company's transparency.
- Monitor, report, and audit the GHG emission management transparently.
- Establish sustainability governance, including climate change, into the organizational functions of all PLN Group business processes.
- Ensure the alignment of climate change policies with sustainable policies, environmental policies, and other related policies.

In addition, PLN has established 17 management guidelines that cover 11 environmental aspects and 6 social aspects:

- Labor and Working Condition Management Guideline: Ensuring fair and safe working conditions for all project workers, including third-party labor and supply chain workers, with standards tailored to each worker category.
- Air Quality Management Guideline: Managing emissions and air pollution to maintain healthy air quality for communities and the environment.
- Biodiversity Management Guideline: Protecting ecosystems by managing biodiversity aspects through screening, assessment, mitigation (including compensation), and monitoring.
- Community Health, Safety, and Security Management Guideline: Protecting communities from project-related risks and impacts, with special attention to vulnerable groups to ensure their safety and well-being.
- Cultural Heritage Management Guideline: Ensuring that PLN's projects do not negatively affect tangible (buildings, historical sites) or intangible (traditions, customs, cultural values) cultural heritage.
- Indigenous People Management Guideline: Respecting the rights and cultures of indigenous communities while mitigating the impacts of projects on their livelihoods.
- Erosion and Sediment Control Management Guideline: Reducing erosion impact and controlling sediment buildup to maintain soil stability and water quality.
- Non-Hazardous Waste Management Guideline: Handling non-hazardous waste efficiently and in an environmentally friendly manner to minimize negative impacts.
- Stakeholder Engagement Management Guideline: Establishing meaningful and inclusive communication with stakeholders, ensuring their involvement in project processes, and documenting every step transparently.
- Water Efficiency Management Guideline: Ensuring efficient water use, particularly from natural water sources, to prevent excessive exploitation.
- Land Acquisition and Resettlement Management Guideline: Managing land acquisition and resettlement processes in accordance with national and international standards to ensure fairness for affected communities.
- Noise and Vibration Control Management Guideline: Minimizing the impact of noise and vibrations generated by activities or projects to prevent disturbances to the surrounding environment.
- Hazardous Materials Management Guideline: Controlling the use of hazardous substances to prevent risks to both the community and the environment.
- Hazardous Waste Management Guideline: Managing hazardous waste safely and in compliance with regulatory standards to minimize environmental and health risks.
- Wastewater and Water Quality Management Guideline: Managing wastewater discharge to prevent contamination of nearby water sources and ensure compliance with environmental standards.
- Energy Efficiency Management Guideline: Optimizing energy use, including fuel, gas, and electricity, to enhance efficiency and environmental sustainability.
- Independent Power Producer (IPP) E&S Guidelines for Solar PV Project and Onshore Wind Power Project: Respecting the rights and cultures of indigenous communities while mitigating the impacts of projects on their livelihoods.

Engagement Strategy

PLN recognizes that achieving its strategy requires engagement with various stakeholders, including its supply chain, industrial sectors, regulators, and communities. Accordingly, PLN's roadmap strategy has identified several initiatives to foster collaboration with these stakeholders.

Engagement with value chain

As part of its commitment to reducing Scope 3 emissions, PLN actively engages with key stakeholders across its value chain, including sub-holdings, business partners, and government entities. The company's current approach includes awareness-building initiatives through various socialization programs targeted at these critical supply chain actors.

PLN's core value chain lies in the electricity generation industry, where power plant operations serve as the essential backbone of supply. The primary components of this value chain are:

1. Sub-Holding and Subsidiary generation companies
2. Independent Power Producer (IPP)

Climate risk management for PLN's sub-holdings and subsidiaries is governed by its integrated enterprise-wide risk and sustainability framework which incorporates climate risk factors into long-term energy transition planning, operational resilience, and project development. PLN adopts a targeted engagement strategy to integrate climate considerations into upstream partnerships with IPPs where it takes the following approaches:

1. Issuing an IPP Environmental and Social (E&S) Guideline document which requires a design that anticipates climate risks.
2. PLN engaged with IPPs to disseminate the guideline through two socialization activities, the first for wind power on February 1, 2024, and the second for solar power on November 14, 2024, as shown in **Figure 18**.

Figure 18 IPP E&S Guideline Socialization

Through these projects, PLN ensures that IPPs incorporate climate-resilient features during the design phase, paying particular attention to things like site selection and infrastructure layout, to mitigate operational and environmental risks. Through this strategy IPPs can better predict and anticipate the secondary impacts from climate-related events, like the spread of hazardous or non-hazardous materials due to flooding, or wastewater leakage during construction or operational activities.

To further integrate climate strategies into their business and operational plans, PLN has developed a comprehensive action plan to promote sustainable practices within the supply chain. Key initiatives include:

- Sustainable Supply Chain & Procurement Desk Study
- Sustainable Supply Chain & Procurement Evidence for Rating
- Sustainable Supply Chain & Procurement Implementation for ESMS
- Sustainable Supply Chain & Procurement Culture Assessment
- Sustainable Supply Chain & Procurement Policy Enhancement

Additionally, PLN has developed a Sustainable Supply Chain framework to integrate sustainability considerations across all its supply chain processes, including procurement, product design, production, and logistics, as shown in **Figure 19**. PLN's current primary focus is advancing sustainable procurement, ensuring that ESG principles are embedded into sourcing and supplier engagement strategies.

Figure 19 Green/Sustainable Supply Chain

Engagement with Industry

a. Hydrogen Ecosystem Development
Through its subsidiaries, PLN is actively collaborating with global partners to accelerate hydrogen ecosystem development in Indonesia by securing technology access and investment opportunities, as shown in **Figure 20**. One landmark initiative is the Waingapu Fuel Cell H_2 Power Plant, developed in partnership with HDF Energy. This project, which targets commercial viability in 2026, would be the first fuel cell-based hydrogen power plant in the Asia Pacific region.

In addition, PLN is working with Sembcorp to develop the Jambi Green Hydrogen Plant, which is projected to produce 100 ktpa of hydrogen annually by 2027, making it one of the largest hydrogen production facilities in Southeast Asia. Another key project, the Gresik Green Hydrogen Plant, is being developed in collaboration with ACWA Power and is set to produce 16 ktpa of hydrogen by 2027, with Indonesia Fertilizer as its main offtaker. These strategic partnerships reinforce PLN's commitment to positioning Indonesia as a regional leader in hydrogen energy, driving technology transfer, sustainable energy innovation, and economic growth while strengthening Indonesia's role in the global hydrogen economy.

Project Name	Partner	Target COD	Yearly Projected Revenue	Status Progres	Next Step
Gresik Green Hydrogen Plant	ACWA POWER, PUPUK INDONESIA	Q1 2027	82.5 MUSD	Feasibility Study	Offtake Agreement August 2024
Jambi Green Hydrogen Plant	sembcorp, Transjawa	Q2 2027	550 MUSD	Feasibility Study	Joint Development Agreement Q4 2024
Kujang Green Ammonia Plant	PUPUK INDONESIA, FORTESCUE FUTURE INDUSTRIES	Q3 2027	1.6 MUSD	Feasibility Study	FEED Q1 2025 Completion
PLTS/Fuel Cell Sumba Timur	HDF ENERGY	Q4 2027	26.4 MUSD	Feasibility Study	Power Purchase Agreement (PPA) December 2024

Figure 20 PLN's Strategic Partnerships on Hydrogen Ecosystem Development

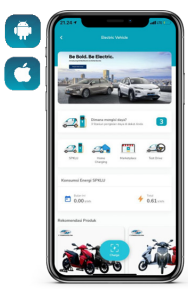
b. Electric Vehicle (EV)

PLN is also expanding Indonesia's transition to electric mobility through the development of EV infrastructure and strategic partnerships, as shown in **Figure 21**. PLN is committed to transitioning the transportation sector's reliance on imported fossil fuels to domestic electricity use, promoting energy independence and reducing emissions. PLN has established a robust nationwide charging network, deploying approximately 1,000 EV charging stations and 1,900 battery-swapping stations while supporting over 5.2 million home charging users. Through the integration of EV Digital Services (EVDS) with PLN Mobile, PLN enhances user accessibility through real-time station information, seamless payment solutions, and route optimization for EV owners. To further accelerate adoption, PLN has formed alliances with 23 strategic partners, including global automotive brands, financial institutions, and technology firms, to support Indonesia achieving energy independence and emission reduction.

~ 2,240 Battery swap stations	**~ 26,795** Home charging customers	**~ 12.1 GWh** Electricity consumed by EVs
~ 3,233 Vehicle charging stations machine	**~ 402,509** Users of EVDS in PLN Mobile	**~ 20.6 kton CO2** CO2 reduction

39 partners
committed and collaborated to accelerate EV ecosystem growth

EVDS
Our e-mobility ecosystem is integrated with PLN Mobile



Home Charging Services
Accelerating EV ecosystem through incentives for installation and charging cost

Figure 21 PLN's EV Infrastructure and Strategic Partnerships

PLN also actively promotes private-sector involvement in the expansion of EV infrastructure through a franchising business model, as shown in **Figure 22**. With 1,082 EV charging stations established in strategic locations, including malls, supermarkets, hotels, business districts, and rest areas, PLN is enabling seamless access to charging facilities, further accelerating EV adoption in Indonesia.

Figure 22 PLN's EV Charging Stations Partnerships

c. Carbon Capture Study

PLN is developing a comprehensive CCS implementation strategy as part of its long-term decarbonization pathway toward NZE by 2060. The company has established partnerships with global energy leaders including INPEX, JERA, and JGC to advance CCS technology deployment across its generation assets. These collaborations focus on conducting detailed feasibility assessments and pilot-scale demonstrations for retrofitting existing coal-fired power plants with carbon capture systems, as shown in **Figure 23**.

The initial phase of this initiative, supported by investment funding from JERA and JGC, has already yielded promising results from retrofit studies conducted at the Indramayu CFPP. Technical assessments indicate the potential to capture approximately 6.3 million tons of CO_2 annually by 2040 through the implementation of CCS technology. This pilot project serves as a critical proof-of-concept for wider CCS deployment across PLN's generation portfolio.

This CCS development program represents a key component of PLN's balanced energy transition strategy, which prioritizes both emissions reduction and system reliability. The phased implementation approach allows for technology optimization and cost reduction through lessons learned from early projects, while maintaining stable power supply during the transition period. The initiative demonstrates PLN's commitment to exploring all viable technological solutions to achieve its climate commitments, including the potential conversion of existing fossil fuel assets into lower-carbon generation sources through carbon capture retrofits.

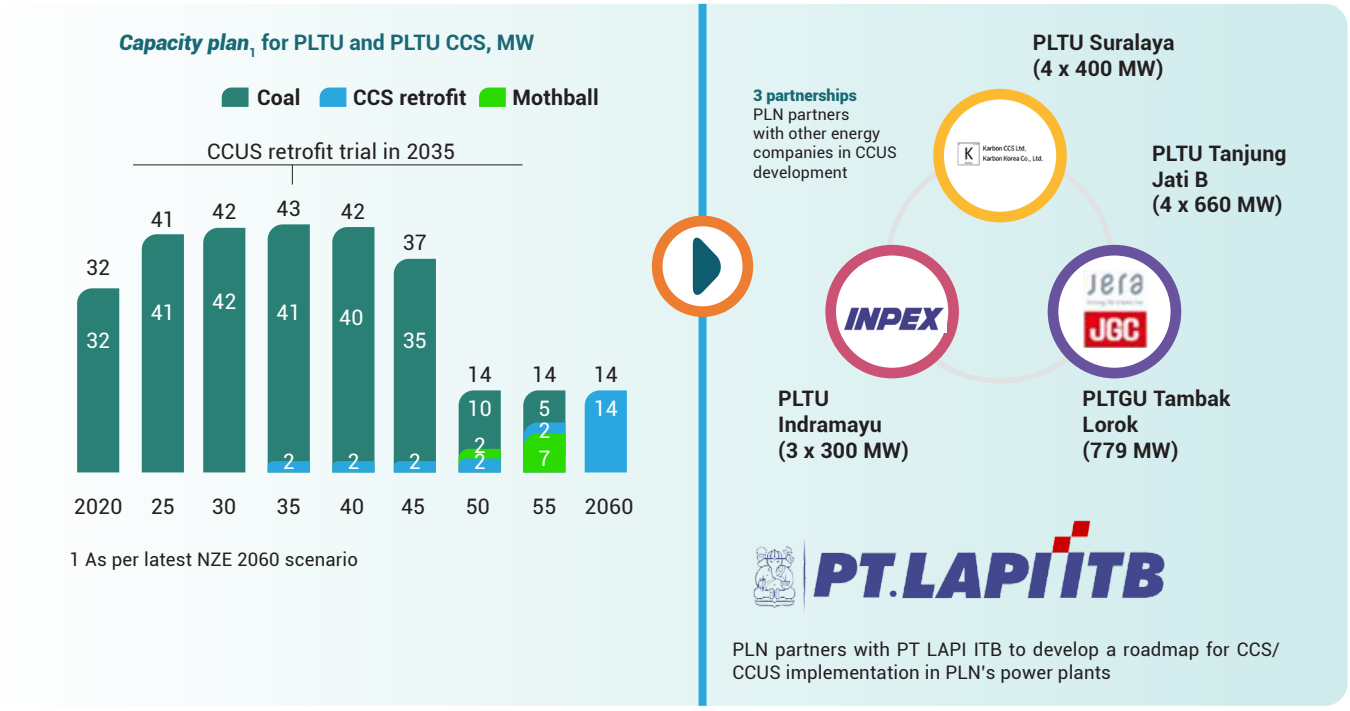


Figure 23 PLN's CCS Development Program

d. Nuclear Energy as a Future Power Source
PLN recognizes the important role nuclear energy plays in achieving NZE and has engaged in partnerships with international nuclear technology experts, including Rosatom, BRIN, USNC, EDF, and KEPCO to develop Small Modular Reactors (SMRs) and large-scale nuclear reactors, with implementation planned by 2040. These collaborations aim to integrate nuclear power into Indonesia's energy mix, ensuring long-term sustainability and energy security.

Engagement with the Regulators

Indonesia's sustainability landscape is shaped by a broad network of policymakers and regulatory entities, each playing a crucial role in driving climate action and sustainable development. As the country's leading electricity provider, PLN collaborates closely with regulators, aligning its strategies with national climate goals and ESG principles to support Indonesia's transition toward a low-carbon economy.

Key regulatory bodies involved in shaping the sustainability agenda include:

- Ministry of Environment – Develops Indonesia's NDCs and leading engagements with the UNFCCC.
- Ministry of Energy and Mineral Resources – Sets renewable energy policies, including tariff regulations and power sector decarbonization through the RUPTL.
- Ministry of Finance – Implements fiscal policies that promote renewable energy investments and sustainable financing, including carbon taxation.
- Ministry of Development Planning (Bappenas) – Integrates sustainability goals into Indonesia's National Medium-Term Development Plan (RPJMN) and setting climate-resilient economic targets.
- Financial Services Authority (OJK) – Regulates sustainable finance implementation and reporting, ensuring corporate alignment with ESG frameworks.
- Indonesia Stock Exchange (IDX) – Facilitates ESG-driven financial instruments, carbon trading (IDX Carbon), and sustainability-linked investment opportunities.

Beyond regulatory bodies, PLN also actively collaborates with key institutions to ensure accountability, transparency, and effective execution of its energy transition initiatives:

- Ministry of State-Owned Enterprises (BUMN) – Oversees corporate performance reporting, including sustainability targets.
- Supreme Audit Agency (BPK) – Assesses PLN's energy transition progress for 2023.
- Financial and Development Supervisory Agency (BPKP) – Conducts ESG audits to enhance corporate governance and sustainability compliance.
- Coordinating Ministry for Maritime Affairs and Investment (Kemenko Marves) – Provides strategic guidance to the National Energy Transition Task Force.
- Coordinating Ministry for Economic Affairs (Kemenko Ekonomi) – Facilitates discussions (FGDs) on international carbon trading to strengthen Indonesia's carbon market ecosystem.

Engagement with the Community

PLN also acknowledges the challenges associated with its activities and recognizes that its transformation toward achieving net zero emissions may impact society. Therefore, PLN is committed to meaningful stakeholder engagement to deliver tangible solutions that are both integral to its strategy and operations, as well as considerate of community interests. These engagement initiatives include:

- Heroic Effort Biomass

  PLN has implemented a comprehensive biomass co-firing initiative across 52 coal-fired power plants (CFPPs) that delivers substantial economic, social and environmental benefits. The program generates an annual economic impact of IDR9.43 trillion while directly improving livelihoods for 1.25 million Indonesians through increased incomes averaging IDR7.5 million per beneficiary. Environmentally, the substitution of 10 million tons of coal with biomass feedstock results in significant emissions reductions of 10.75 million tons CO_2e annually, supporting Indonesia's climate commitments.

  The program incorporates innovative community development models that address multiple sustainability challenges. In Gunung Kidul, PLN has partnered with local governments to establish integrated farming systems that simultaneously produce biomass feedstock and solve chronic livestock feed shortages during drought periods. The cultivation of drought-resistant Indigofera plants (1,700 trees per hectare) provides both sustainable biomass material and nutritious animal feed, eliminating the need for emergency "*sapi makan sapi*" practices where cattle resort to unconventional food sources.

  In Cilacap Regency, PLN has developed a 100-hectare biomass plantation across 11 villages to support the PLTU Adipala power plant. This initiative engages 330 local farmers, organized into 18 Forest Farmers Groups (KTH) and three Village-Owned Enterprises (BUMDes), creating a sustainable community-based supply chain. The program focuses on fast-growing Gamal and Kaliandra tree species that provide both ecological benefits and economic opportunities for participating communities.

- Green Leadership

  As Indonesia's primary electricity provider, PLN is driving a transformative shift toward green leadership, aligning with global sustainability goals. Under the CEO's vision, PLN is actively integrating renewable energy sources, promoting electrification, and implementing innovative green technologies. This strategic move is crucial in reducing carbon emissions while ensuring energy security and affordability for Indonesia's growing economy. By leveraging digitalization and fostering collaborations with key stakeholders, PLN is positioning itself as a leader in the global energy transition.

Figure 24 PLN's Director Received Green Leadership Award

PLN is focused on key initiatives like decarbonizing its power generation, expanding the role of new and renewable energy, and developing smart grids to achieve its ambitious sustainability targets. The company's roadmap includes phasing out coal-fired power plants and investing in clean energy alternatives like solar, wind, and hydroelectric power. Additionally, PLN is championing electric mobility and energy efficiency programs, ensuring a just transition that supports economic growth while preserving environmental integrity. Through these efforts, PLN is reinforcing its commitment to a greener, more sustainable future.

Human Capital Workforce

PLN recognizes that in order to support these energy transition strategies and technological advancements, strengthening human resources capabilities in new competencies must be prioritized. PLN has identified the need for a continuous learning platform that ensures skill application, expertise development, and innovation. Thus, the company has developed a capacity building program to equip employees with the necessary skills, fostering resilience and a sustainable future for the energy sector, as shown in **Figure 25**.

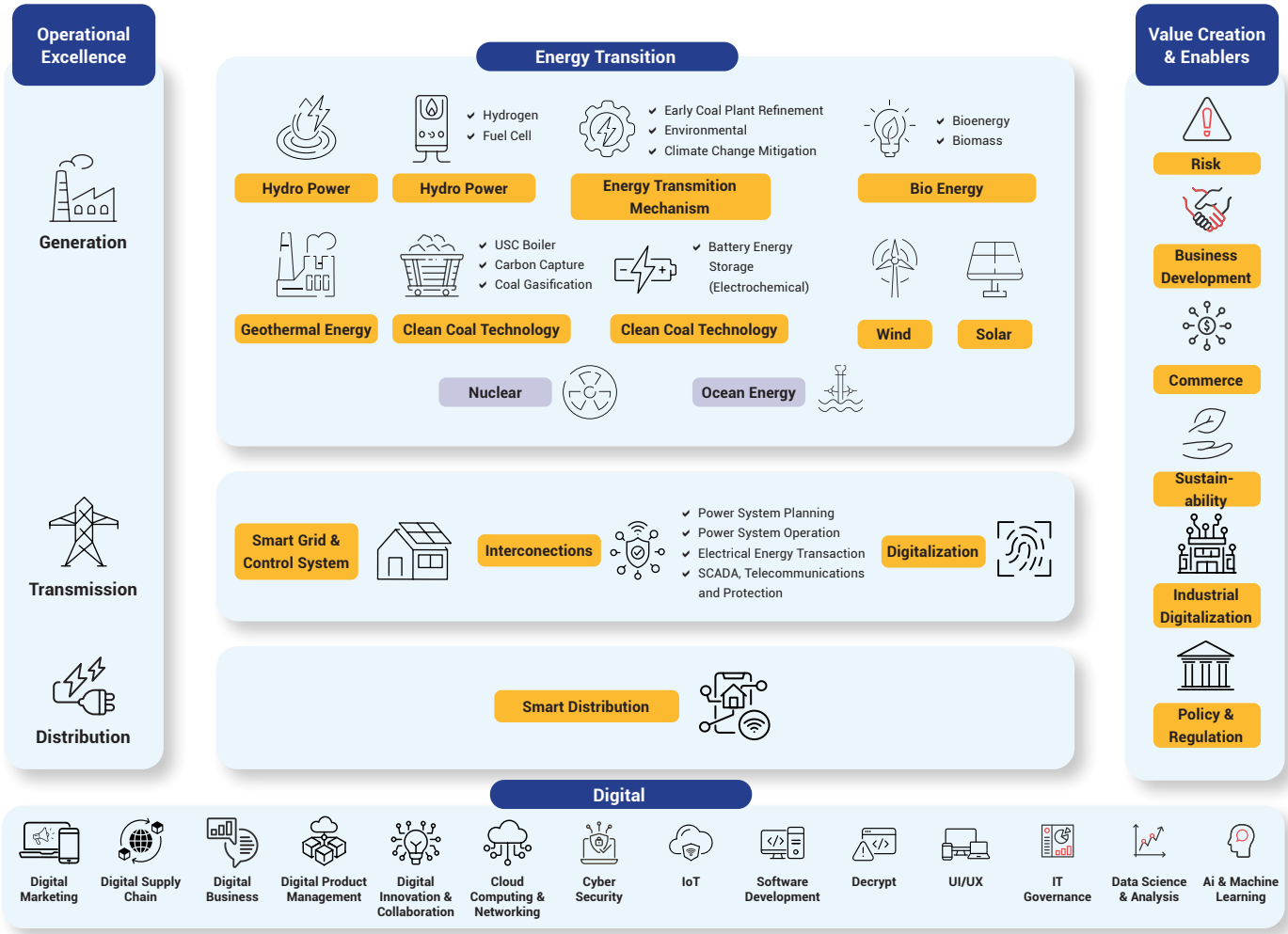


Figure 25 Capacity Building Program

Aside from the capacity building program, PLN has also established the Sustainability Academy to integrate sustainability principles into its operations and corporate culture. This initiative educates employees on sustainable practices across all business aspects, ensuring that ESG considerations are embedded in decision-making processes and daily operations.

These human capital initiatives are essential as Indonesia advances its clean energy transition, which offers significant potential for green job creation. Through its Electricity Supply Business Plan (RUPTL) 2021–2030 and support from the Just Energy Transition Partnership (JETP), PLN is paving the way for the development of renewable energy and efficiency improvements in existing power infrastructure. These efforts are expected to generate nearly 100,000 high-skilled jobs, particularly in regions like East Kalimantan, South Kalimantan, and South Sumatra. By aligning its workforce development with national energy goals, PLN plays a key role in promoting a just, inclusive, and sustainable energy future for Indonesia.

CLIMATE RELATED EFFECTS ON COMPANY'S FINANCIAL STRATEGY

To support the implementation of PLN's short- and long-term strategy, PLN is directing its capital expenditure toward renewable energy development, prioritizing investments that advance energy transition and the adoption of advanced low-carbon technologies. Demonstrating its commitment to sustainable financing, PLN has developed a series of frameworks to guide its investment activities:

a. Statement of Intent on Sustainable Financing Framework (2020): This initial declaration set the foundation for PLN's sustainable finance strategy, emphasizing the company's dedication to integrating ESG considerations into its operations.
b. Green Financing Framework (2021): Building upon its initial commitment, PLN established this framework to facilitate investments specifically aimed at environmentally beneficial projects.

These frameworks not only provide transparency and accountability but also position PLN as a proactive participant in the global movement towards sustainable energy. By integrating ESG principles into its core operations and financing strategies, PLN is setting a precedent for utility companies in emerging markets.

In assessing investment and financial considerations, PLN must consider key economic variables to safeguard the company's financial health. Sustaining these variables, however, necessitates addressing a range of challenges. The detailed information on the economic variables and associated challenges as shown in **Table 7**.

Table 7 Economic Variables and Associated Challenges

Economic Variables	Challenges
• Consolidated Interest Coverage Ratio: Measures the ability of a group company (consolidated) to pay debt interest from operating profit. To fulfill the covenant requirement, it must have a value greater than twice. • Self-Financing: 3-year internal cash to Capex ratio. To fulfill the covenant requirement, it must have a value greater than 15%. • Debt to Equity: A measure that compares total debt to the company's total equity. To meet covenant requirements the limit must be less than 300%. • Debt to Asset: Measures the percentage of a company's total assets that are financed by debt. To meet covenant requirements the limit must be less than 80%. • EBITDA to Interest: Measures the company's ability to pay interest on its debt using EBITDA. To fulfill the covenant requirement the threshold must be greater than 1.5. • EBITDA: An important indicator of a company's operating profitability, which reflects earnings before accounting for interest, taxes, depreciation, and amortization. • EBITDA Margin: The percentage of EBITDA to total company revenue, which illustrates operational efficiency. • Retained Cash Flow/Debt: Comparing the net cash flow remaining after dividend payments with the company's total debt	• Legal Lending Limit (LLL) on local bank financing: Financing from domestic banks is limited to a maximum of 30% of equity. In September 2023, existing creditors stated that the remaining BMPK threshold for lending to PLN is a maximum of IDR165 trillion. • Single Borrower Limit (SBL) / Offshore Banking Financing Capacity Constraints: Foreign banks also have funding limitations depending on the policies of each bank. As of September 2023, Indonesia's power sector still has the opportunity to obtain funding from the Development Bank of around USD2.85 billion per year. • ESG requirements: ESG requirements require adjustments to PLN's policies and business. In addition, the large exposure of PLTU in PLN companies causes resistance from investors in providing financing. • Financial Market Volatility: Global instability affects loan pricing and market liquidity for PLN financing. • Local Content Requirement (TKDN): PLN must comply with TKDN regulations, which sometimes conflict with lenders' guidelines.

Thus, in facing the funding challenges, PLN is undertaking various financial strategies to support the energy transition plan:

1. The first strategy is to establish priorities to support financing options for the energy transition as shown in **Table 8**.

Table 8 Priorities to Support Financing Options

Funding Priorities	Funding Sources
• Seeking funding from PMN or government equity injections for projects that are not commercially viable. • Seeking grants and low-cost financing. • Increase the portion of rupiah-denominated loans to reduce exposure to exchange rate and currency mismatches. • Adjust long-term borrowings to match the construction period and the asset's lifespan. • Utilize credit enhancement from multilateral or international guarantor agencies to reduce PLN's default risk and loan exposure. • Prioritize negotiating more flexible loan agreement packages, as well as for last resort. • Consider fixed-rate loans to reduce exposure to volatility in benchmark interest rates	• Two Step Loan (SLA): Loans from international financial institutions to the government, then channeled to PLN through Subsidiary Loan Agreements. • Direct Lending Onshore/Offshore: Direct funding from domestic (onshore) or international (offshore) financial institutions without intermediaries. • Export Credit Agency (ECA): Institutions that provide financing or insurance to support the export of goods and services. • Commercial Loans & Global Bond: Funding from commercial loans or global bond issues. • •Onshore Direct Lending & IDR Bond: Direct funding from domestic institutions. Meanwhile, IDR Bonds are Rupiah-denominated bonds issued in the domestic market. • Financing with Collateral: Support from multilateral institutions such as the World Bank or ADB to secure financing.

2. The second strategy is to divide the source of funds into public funding and private funding, as shown in **Figure 26**.

Funding Modalities	Funding Instrument/Type
1 Public	• Grants/technical assistance • Guaranteed frin MDBs • Concessional loan • Non-concessional loan • Equity investment
2 Private	• Commercial loans (private non-concessional loans) • Equity Investment • Capital Market
3 Blended Funding	• Credit enhancement mechanism • Guarantee • Non-fiscal incentives
4 Filantropi	• Grants/technical assistance/risk capital
5 Carbon Funding	• Carbon market: Emissions trading systems and carbon offsets • Carbon tax • Outcome-based payments

Figure 26 Public Funding and Private Funding

PLN has developed a targeted financing roadmap that aligns private capital with its energy transition priorities, as shown in **Figure 27**. The company has mapped specific financial instruments to each investment focus area, creating a diversified funding approach to support Indonesia's decarbonization goals.

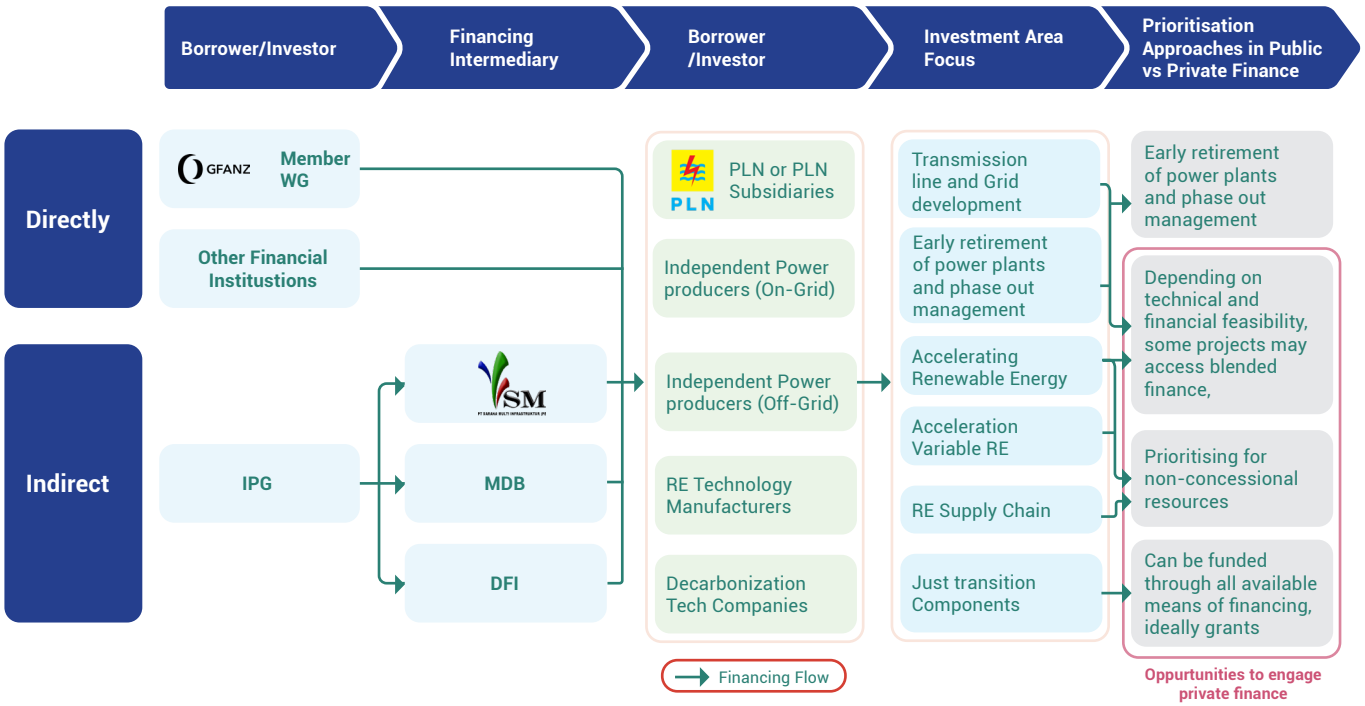


Figure 27 Financing Roadmap

3. The third strategy focuses on enhancing collaboration with international partners to ensure the long-term success and sustainability of PLN's financing and energy transition initiatives.
   - Sustainable Finance Partnerships: Establishing strong partnerships is essential to support sustainable financing under the PLN Sustainable Financing Framework and other relevant global standards.
   - Short- to Medium-Term CAPEX Financing: Capital expenditure financing is required to support PLN's investment needs through 2030 and facilitate the transition towards Net Zero Emissions by 2060.
   - Strengthening the Financing Framework: PLN's sustainable financing framework needs to be continuously aligned with local and global standards.

4. The final strategy involves establishing funding schemes for projects that are not commercially viable.
   - Several renewable energy (EBT) projects face financial viability challenges. To address this, PLN requires government financial support to develop such projects, enabling the company to prioritize high-quality and strategic growth.

5. Potential financing schemes for this government support could be through capital injection (PMN) or newly proposed financing schemes as shown in **Figure 28**.

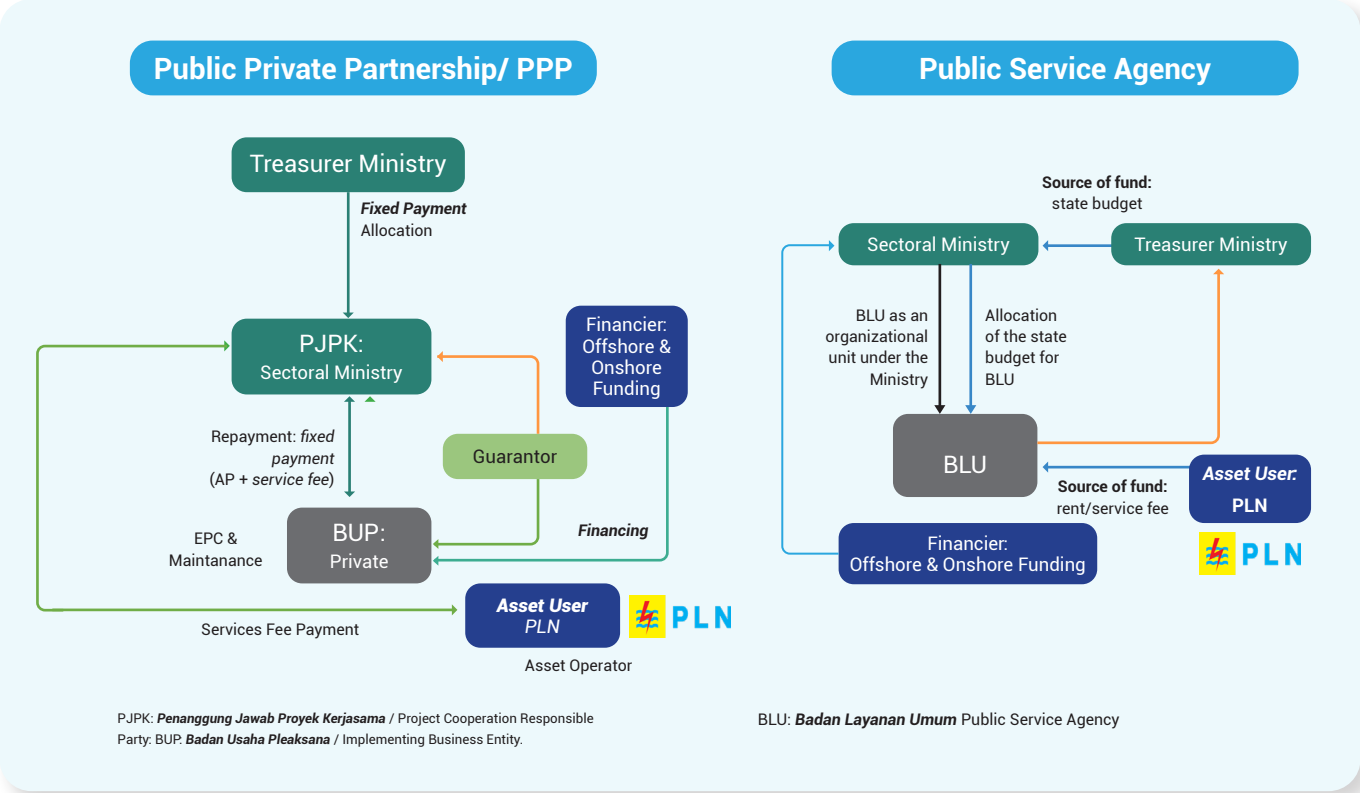


Figure 28 Potential Financing Schemes

FINANCIAL POSITION, PERFORMANCE, AND CASH FLOWS

In order to maintain PLN's financial performance and position, as well as achieve the energy transition goals, PLN needs to invest a total of ±USD110 billion between 2024-2033, as detailed in **Figure 29**.

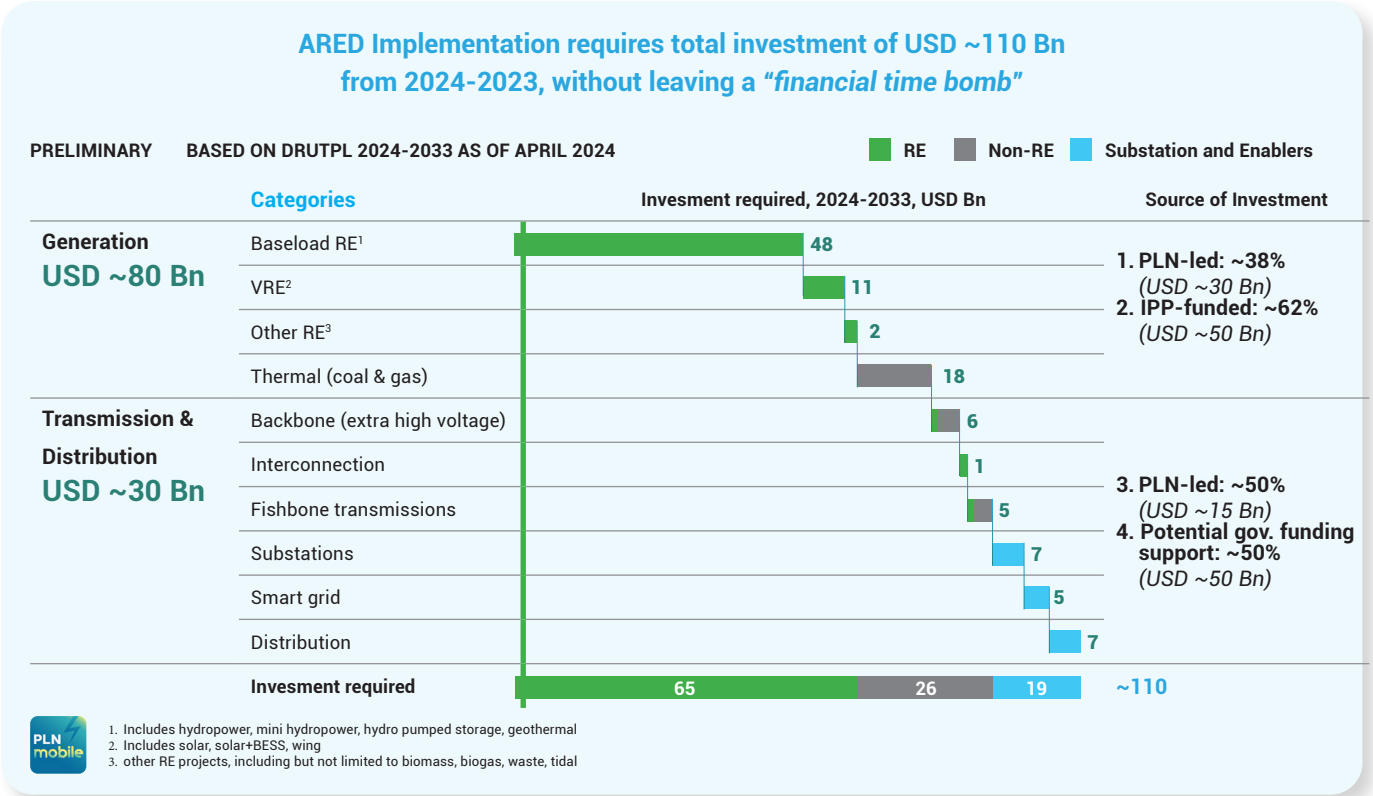


Figure 29 Investment Required in 2024 – 2033

PLN's financing flow for investment areas, like natural CFPP retirement, phased-out coal, variable RE acceleration, and supply chain, has identified a need for both direct and indirect private funding to support critical areas in Indonesia's energy transition. The approach for each investment focus area is different as each face different technical and financial challenges, as well as concessional and non-concessional resources.

International partnerships are essential to supporting PLN's sustainable financing, ensuring alignment with its sustainable financing framework and other related frameworks. They also play a key role in financing PLN's short- and long-term objectives while supporting continuous improvements in its sustainable financing framework, ensuring alignment with international and local sustainability standards or taxonomies.

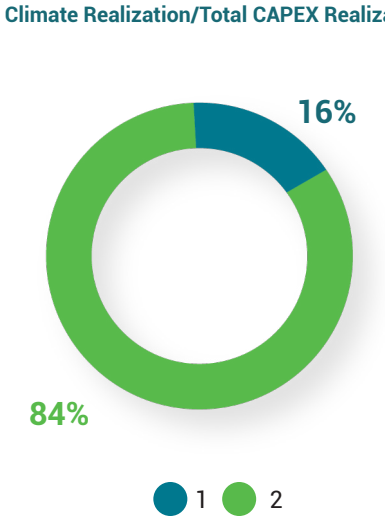


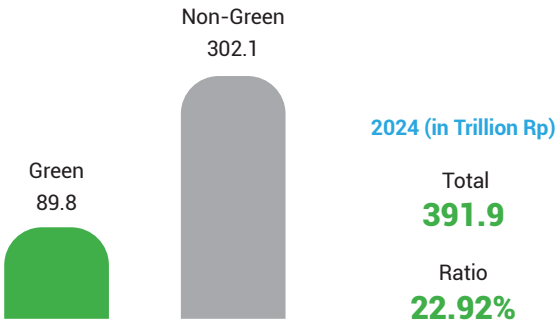
Figure 30 Realized Investment in Climate-Related and Energy Transition Programs

In 2024, PLN demonstrated its commitment to sustainable development through strategic capital allocation, directing IDR 63.6 trillion in total CAPEX toward infrastructure and operational investments, as shown in **Figure 30**. Of this amount, IDR 10.07 trillion (15.9%) was specifically allocated to climate-related initiatives supporting the energy transition plan, reflecting the company's prioritization of decarbonization efforts within its broader investment portfolio. The remaining IDR 53.48 trillion (84.2%) supported essential grid modernization, baseload generation, and operational resilience projects. PLN's 2024 investment distribution highlights its dual mandate of driving Indonesia's energy transition while maintaining financial and operational resilience. By strategically allocating 15.9% of CAPEX to climate initiatives, PLN reinforces its role as a key enabler of Indonesia's low-carbon future. Moving forward, the company aims to increase the proportion of green investments while ensuring energy affordability and system reliability for all stakeholders.

Sustainable Financing Ratio

The sustainable financing ratio measures the percentage of sustainable financing in proportion to total financing, reflecting PLN's commitment to supporting sustainable projects. This ratio highlights the portion of PLN's financing directed toward initiatives that promote sustainability. Sustainable financing refers to funding obtained through instruments designated for sustainable purposes. These include green, social, and sustainability bonds; financing from multilateral development banks specifically allocated to sustainable projects; and project loans whose use of proceeds support sustainable initiatives, excluding those related to coal development, operations, or maintenance. Eligible projects are determined based on the use of proceeds and include initiatives such as renewable energy, electric vehicles (EVs), and other sustainability-focused efforts. In 2024 as shown in **Table 9**, PLN's sustainable financing ratio reached 22.9%, based on the total financing of green and non-green projects.

Table 9 Sustainable Financing Ratio



Climate Financing

To support Indonesia's commitment to sustainable development and energy transition, PLN estimates a total investment requirement of USD 171 billion for the 2025–2034 period as outlined in the Draft RUPTL. This amount excludes an additional USD 17 billion for maintenance capital expenditure (USD 12 billion) and interest during construction (IDC) (USD 5 billion), which would raise the overall financial commitment even further.

The planned investment will be directed toward a diverse portfolio of infrastructure and generation projects. The largest allocation, approximately USD 63 billion, will fund the development of additional renewable baseload capacity of around 22 GW. This includes hydro (11.7 GW), pumped storage (4.2 GW), geothermal (5.2 GW), and bioenergy (1 GW) projects. In parallel, thermal baseload generation, comprising gas (10.3 GW) and coal (6.3 GW), is expected to require about USD 26 billion to add approximately16 GW of capacity.

A significant share, around USD 34 billion, is earmarked for variable renewable energy (VRE) sources, notably solar (17.1 GW) and wind (7.2 GW), targeting a total of approximately 24 GW in new clean generation. To support grid reliability and energy storage needs PLN plans to develop battery energy storage systems (BESS) with a projected capacity of 6 GW/26 GWh at an estimated cost of USD 4 billion, assuming a levelized cost of 4 cUSD/kWh.

In addition, nuclear energy is also projected to contribute 0.5 GW of capacity, supported by an investment of USD 3 billion based on levelized cost assumption of 10 cUSD/kWh. Transmission infrastructure represents another major focus area, with about 48,000 kilometers of new transmission lines and substations requiring an investment of USD 24 billion. Additionally, PLN aims to expand distribution networks by approximately 200,000 kilometers, at a projected cost of USD 11 billion.

Finally, PLN plans to invest approximately USD 5 billion in building an end-to-end smart grid system covering 5 regions and 38 provinces across Indonesia. This investment will support digitalization and intelligent grid management to better integrate the growing share of intermittent renewable energy sources.

PLN plans to finance this extensive investment program through a combination of disbursed capital expenditure and funding from IPP, leveraging a new fixed asset approach. This integrated investment strategy is critical to enabling a reliable, affordable, clean power sector supporting national energy security and climate goals.

05

CLIMATE-RELATED METRICS AND TARGETS

CLIMATE-RELATED METRICS

GHG EMISSIONS COVERAGE AND METHODOLOGY

PLN has established a standardized procedure for managing GHG emissions, as outlined in Director's Circular No. 0025 of 2022, which aligns with both national and international standards. This procedure defines clear responsibilities, authority levels, and monitoring systems to ensure effective emission management.

To monitor progress, PLN conducts a biweekly Sustainability War Room (SWR), where the TEK Division reports absolute GHG emissions in metric tons as a key performance indicator. PLN also uses APPLE-GATRIK, a web-based platform, to report emissions from power plants to the Directorate General of Electricity (MEMR). This reporting process includes a structured verification at both the Parent Unit and Head Office levels, supported by regular audits for compliance.

PLN's greenhouse gas (GHG) emission inventory includes carbon dioxide (CO_2), methane (CH_2), nitrous oxide (N_2O), sulfur hexafluoride (SF_2), and other gases regulated under the UNFCCC, in alignment with the US EPA GHG Inventory Guidance.

To ensure transparency in tracking its decarbonization efforts, PLN reports GHG emissions including generation and non-generation activities. The Climate-related Disclosure Report provides absolute figures to support year-on-year performance evaluation. A comprehensive overview is provided for Scope 1, 2, and 3 emissions.

- Scope 1 covers direct emissions resulting from fuel combustion at PLN-operated power plants, as well as fugitive emissions.
- Scope 2 accounts for the indirect emissions associated with purchased electricity, encompassing losses from IPPs, imported energy, office usage, and distribution networks.
- Scope 3 includes indirect emissions resulting from electricity supplied by IPPs, the procurement of goods and services including fuels, equipment, construction, and transport, asset purchases, employee business travel, and the discharge of solid waste. Scope 3 data is derived from actual procurement transactions, utilizing emission factors aligned with the most recent US EPA 2022 references.

PLN utilizes specific methodologies for each sector, adhering to national guidelines. Scope 1 emissions are calculated using the 2006 IPCC Guidelines along with national emission factors, with SF_6 emissions calculated based on AR6 GWP values. Scope 2 emissions are calculated using a location-based approach which considers grid emission intensity. Finally, Scope 3 emissions cover emissions related to the supply chain and investments, as classified by the US EPA categories.

In 2024, PLN completed an independent verification of its 2023 greenhouse gas emissions at the corporate level, conducted by PT TUV Rheinland. This verification was carried out to ensure that the methodologies, data sources, and calculations used were in accordance with international standards. As part of PLN's ongoing efforts to enhance the accuracy and comprehensiveness of its emissions reporting, several key updates were implemented. These included the application of specific emission factors to differentiate between fuel types in both generation and non-generation activities, the adoption of updated Scope 3 emission factors based on the latest US EPA 2022 data GWP values from the IPCC AR6 2023. PLN also expanded its coverage by including fugitive emissions beyond SF_6, incorporating Scope 2 emissions from imported energy, and broadening Scope 3 boundaries to account for business travel as well as the disposal of both solid and hazardous waste.

Total Carbon Emission

Table 10 Total Emission based on Scope (Million Ton CO_2eq)

Emissions	Activities	2024	2023	2022
SCOPE 1	Generation Activities			
	Oil	7.74	6.43	6.06
	Gas	23.91	25.11	21.53
	Coal	123.71	117.22	119.06
	Non-Generation Activities			
	SF6	0.61	1.28	1.35
	Fugitive Emissions from Fire Extinguisher*	0.00	-	-
	Fugitive Emissions from AC in Vehicles*	0.02	-	-
	Fugitive Emissions from AC in Rooms*	0.00	-	-
	Fugitive Emissions from Refrigerators*	0.00	-	-
	Fugitive Emissions from Water Treatment Plants (WTP)*	0.05	-	-
	Fugitive Emissions from Wastewater Treatment Plants (WWTP)*	0.01	-	-
	Vehicle and Generator fuel	0.25	0.64	0.33
	TOTAL	156.31	150.68	148.33
SCOPE 2	Generation Activities			
	Electricity energy losses	9.39	8.50	7.53
	Non-Generation Activities			
	Energy Imports*	3.80	-	-
	Office Electricity Consumption	0.40	0.29	0.63
	TOTAL	13.59	8.79	8.16
SCOPE 3	Generation Activities			
	IPP Electric Energy Distributed to Customers	101.36	91.86	79.25
	Non-Generation Activities			
	Fuel Purchases	1.45	1.09	1.32
	Employees' Business Trips*	0.01	-	-
	Asset Purchases	0.42	0.93	0.35
	Purchase of Goods and Services	2.98	4.69	3.65
	Solid Waste Disposal*	0.45	-	-
	TOTAL	106.66	98.57	84.57
Total Emissions Scope 1, 2, and 3 Generation Activities		266.11	249.12	233.42
Emission growth for power generation (%)		6.8	6.7	1.2
Total Emissions Scope 1, 2, and 3 Non-Generation Activities		10.45	8.92	7.63
Emission growth for non-generation (%)		7.2	7.0	0.6
Total Scope 1, 2 and 3 Emissions Generation and Non-Generation Activities		276.56	258.03	241.05

* Emissions from these activities were not inventoried in the years 2022 and 2023.

Based on **Table 10**, in 2024 total GHG emissions from production reached 266.1 million tCO_2e, marking an increase compared to the previous year. Despite this, electricity production also increased 6.4%, from 343.9 TWh in 2024 up from 323.3 TWh in 2023.

Emissions for the previous reporting years (2023 and 2022) have been recalculated to reflect the updated methodology, which includes revised emission factors and approaches. In 2024, total GHG emissions from generation and non-generation activities reached 276.56 million tons of CO_2e, an increase of 7.18% compared to the previous year's 258.03 million tons of CO_2e emissions. This increase was due to a 6.4% rise in electricity production. However, PLN has projected that GHG emissions in 2025 will total 310 million tons of CO_2e, despite an expected addition of 342 TWh in electricity production.

Total Carbon Intensity

In 2024, the GHG emission intensity for Scope 1, 2, and 3 from generation activities amounted to 0.774 tons CO_2e/MWh as shown in **Table 11**.

Table 11 Emission Intensity based on Electricity Production for Generation Activities

Carbon (Ton CO_2e/MWh)	2024		2023		2022
	Target	Realization	Target	Realization	Realization
Scope 1 GHG Emission Intensity	N/A	0.80	N/A	0.79	0.78
Scope 2 and 3 GHG Emission Intensity	N/A	0.75	N/A	0.74	0.72
Scope 1, 2, and 3 GHG Emission Intensity	0.80	0.77	0.86	0.77	0.76

Table 12 GHG Emission Control Performance

Description	Unit	2024	2023	2022
GHG Emission Intensity	Ton CO_2/MWh	0.774	0.770	0.758
Growth emission intensity	%	0.4	1.7	-4.9
Emission per gross revenue	Ton CO_2/MnIDR	0.49	0.51	0.53
Emission growth per gross revenue	%	-4.5	-3.4	-15.6
Emission per gross revenue	tCO_2e/Million USD	7,752	7,769	7,887
Emission growth per gross revenue	%	-0.2	-1.5	-12.1

Based on **Table 12**, GHG emission intensity slightly decreased to 0.774 tCO_2e per MWh in 2023, indicating improved energy efficiency. Emissions from power generation increased by 6.82 percent, while emissions from non-power generation activities rose by 7.2 percent. Additionally, emissions per unit of gross revenue declined to 0.49 per million Rupiah and 7,752 per million USD, reflecting a 0.2 percent decrease compared to the previous year (in USD terms). These results demonstrate ongoing efforts to improve operational efficiency and implement emission reduction strategies across both production and non-production activities.

The carbon intensity trend for Scope 1 and 2 shows improvement as shown in **Table 13**, with values consistently decreasing over the past three-year average. A negative value indicates that each year's carbon intensity has been lower than the past three-year average.

Table 13 Emission Intensity based on Revenue (Generation Activities)

Carbon	Units	2024	2023	2022
Total GHG Emission Scope 1 and 2	Million Ton CO_2e	164.8	157.3	154.2
Total Revenues	Billion USD	34.3	32.1	29.6
Carbon Intensity of Scope 1 and 2	Million Ton CO_2e/USD	0.0048	0.0049	0.0052

Carbon Emission and Intensity of Generation

Carbon emission data for 2022 to 2024 are presented to provide a three-year overview to explain the intensity of emission by each type of powerplant that shown in **Table 14**.

Table 14 Carbon Emission of Generation Activities

Power Plants	Units	2024	2023	2022
DPP	million Ton CO_2e	3.8	3.5	3.3
CFPP		125.1	118.6	119.4
GFPP		3.3	3.8	3.7
CCPP		18.1	18	15.5
GEPP		5.2	4.9	4.8

From 2022 to 2024, CFPPs consistently remained the largest source of carbon emissions, contributing approximately 125.1 million tons of CO_2e or 80% of total power generation emissions in 2024, despite a slight decline in 2023. Diesel Power Plants (DPPs) showed a steady increase over the three years, emitting 3.8 million tons CO_2e or 2.4% of the total emissions from Scope 1 powerplants in 2024. Gas-Fired Power Plants (GFPPs) experienced a decrease in emissions to 3.3 million tons CO_2e, likely due to-applied higher-tier methodologies resulted more accurate emission. Combined Cycle Power Plants (CCPPs) recorded a gradual increase, reaching 18.1 million tons CO_2e. Gas Engine Power Plants (GEPPs) reported an incline in emission, contributing 5.2 million tons CO_2e or 5.3% of the total emissions from Scope 1 powerplants in 2024.

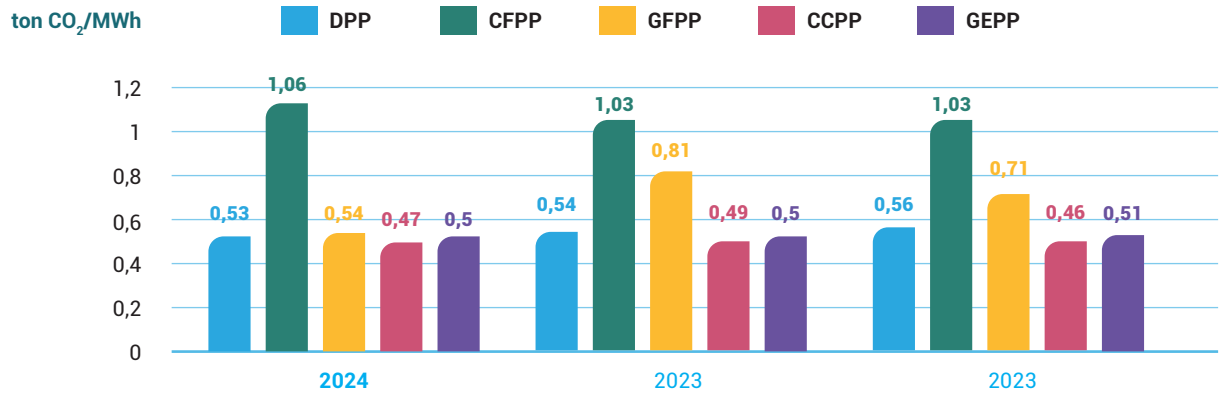


Figure 31 Carbon Intensity based on Types of Generation Electricity Production

During this period, GFPPs showed the most notable increase in efficiency, with carbon intensity decreasing from 0.81 ton CO_2e/MWh in 2023 to 0.54 in 2024. Meanwhile, Diesel Power Plants DPPs slightly decrease compared to 2023. Carbon intensity for Coal-Fired Power Plants CFPPs remained relatively stable, rising marginally by 3% from 1.03 in 2022 to 1.06 in 2024. GEPPs shows maintained a stable intensity at 0.50 ton CO_2e/MWh in 2024, as shown in **Figure 31**.

Over the past three years, based on revenue, the carbon intensity trend showed an improvement for most power plant types within PLN as shown in **Table 15**. This was reflected in the majority negative or decreased carbon intensity values, indicating better performance compared to the average of the previous three years.

Table 15 Carbon Intensity Generation Trends based on Revenue

Power Plants	Units	2024	2023	2022
DPP	Ton CO_2e/millionUSD	-0.07	-0.12	-0.29
CFPP		-0.14	-0.23	-0.21
GFPP		-0.20	-0.01	-0.02
CCPP		-0.09	-0.07	-0.22
GEPP		-0.11	-0.17	-0.08

CARBON ECONOMIC VALUE (CARBON PRICING)

Since the launch of Indonesia's first carbon trading initiative in the electricity sub-sector in 2023, PLN has taken an active role in national carbon trading. This includes direct emission trading transactions conducted through the PLN Climate Click and APPLE-GATRIK platforms, as well as emission offset activities through the IDX Carbon exchange and direct trading.

In 2024, PLN conducted domestic carbon trading transactions, totaling more than 6.8 million tons of CO_2e through two key mechanisms:

- Emission Offsets through SPE-GRK
  The total sale of GHG Emission Reduction Certificates (SPE-GRK) through the IDX Carbon and SRN platforms, originating from the Muara Karang CCGT Power Plant and the Gunung Wugul Mini Hydro Power Plant, reached approximately 54 thousand tons of CO_2e from the initial issuance in 2023 up to December 2024. Transactions on the IDX Carbon platform were divided into two main features. The negotiated trading feature dominated the market, with a volume of approximately 36 thousand tons of CO_2e.
- Emission Trading
  Under the PLN Groups' internal emission trading mechanism which involves regulated CFPPs, approximately 6.8 million tons of CO_2e were traded in 2024. This was conducted using the PLN Climate Click platform and formally recorded in the Ministry of Energy and Mineral Resources (MEMR)'s APPLE-Gatrik system.

PLN's participation in carbon trading and offsets resulted in the following transactions as shown in **Table 16**.

Table 16 PLN's Participation in Carbon Trading and Offsets

Scheme	Unit	2024	2023	Platform
Emission Trading				
Transacted Volume	Million tCO_2e	6.8	6.7	Apple Gatrik & PLN Climate Click
Emission Offset				
Issuance of CERs	Million tCO_2e	4.01	0.93	SRN
Transacted Volume	Million tCO_2e	0.04	0.011	IDX Carbon
	Million tCO_2e	0.002	-	SRN
Total Transacted Volume	Million tCO_2e	0.042	0.011	IDX Carbon and SRN

Furthermore, the volume of traded allowances (PTBAE-PU) increased by 2.93% compared to 2023, reflecting PLN's strengthened participation in the domestic carbon market.

Regulatory Framework for Carbon Trading

PLN's carbon trading and offset mechanisms are regulated under Indonesia's Ministerial Regulation of Energy and Mineral Resources No. 16 of 2022, which outlines the Procedures for Organizing Carbon Economic Value (CEV). The trading system is implemented in three phases:

- Phase 1 (2023-2024), Participation is initially limited to PLTU units ≥100 MW in 2023, with additional participation from PLTU units ≥25 MW in 2024, or as per the latest government provisions.
- Phase 2 (2025-2027), Continuation of Phase 1 participants, with the inclusion of PLTG, PLTGU, PLTMG, and PLTU units <25 MW.
- Phase 3 (2028-2030), Participants from both Phase 1 and Phase 2 will continue, with the addition of PLTD units ≥2 MW.

Trading commences once the emission allowances (PTBAE-PU) are allocated by the MEMR and runs through April 20 of the following year. Surplus allowances from one phase cannot be carried over to subsequent phases, ensuring compliance with the emission reduction targets are tied to each phase.

In addition to the allowance emission trading system, offset emissions are managed through the SPE-GRK trading mechanism. This system is based on the Indonesian Emission Reduction Certificate (SPEI) framework, as outlined in the Ministry of Environment and Forestry Regulation No. 21 of 2022.

Verification and Compliance

PLN follows a structured process for allowance trading, which includes the submission of an emissions monitoring plan, annual reporting of GHG emissions, third-party verification, and trading of emission allowances within a defined timeframe.

For emission offsets, PLN's SPE-GRK comply with Indonesia's Ministry of Environment and Forestry Regulation No. 21 of 2022, which sets the standards for carbon pricing mechanisms. This regulation ensures transparency, integrity, and quality control of carbon credits. To be registered on the carbon exchange, PLN's SPE credits undergo:

1. Registration in the National Registry System (SRN PPI): Each project is formally recorded in the SRN PPI to establish traceability and confirm project ownership, ensuring alignment with national climate commitments.
2. Monitoring, Reporting, and Verification (MRV) compliance: Rigorous MRV processes are applied to validate the quantification of emission reductions as documented in the technical submissions. Verification is conducted by accredited independent third parties, enhancing credibility and mitigating reporting risk
3. Official issuance of SPE for trading: Upon successful verification, SPE-GRK credits are officially issued by the authority. These credits are then listed and made available for trading on IDX Carbon.

CLIMATE-RELATED TARGETS

GHG Emission Reduction Targets

PLN's reported GHG reductions represent the cumulative impact of its decarbonization programs rather than the total annual reduction achieved in a single year. Under a BAU scenario, PLN's GHG emissions were projected to reach 359.1 million tons of CO_2e in 2024. However, due to its decarbonization measures, PLN successfully lowered its total anticipated emissions to 248.2 million tons of CO_2e, achieving a significant reduction of 110.9 million tons of CO_2e emissions recorded since 2022.

In addition to absolute emissions reductions, PLN assesses its GHG reduction performance through emission intensity metrics, which differ from total emission reductions under decarbonization programs and normalize emissions against the amount of electricity generated, providing a more accurate measure of efficiency and progress relative to output. PLN's GHG emissions intensity target for 2024 was 0.801 tCO_2e/MWh, while the actual realized intensity stood at 0.80, slightly surpassing the target. A lower emissions intensity value indicates a decrease in GHG emissions relative to electricity output, demonstrating PLN's ongoing progress in decarbonizing its operations.

In addition to renewable energy expansion and diesel-to-renewable conversion, PLN is implementing several other initiatives to reduce GHG emissions, including:

- Biomass co-firing in CFPPs to reduce coal dependency.
- Conversion of gas power plants into gas and steam power plants to enhance efficiency.
- Implementation of clean coal technology to minimize emissions from existing fossil fuel-based plants.

Through these initiatives, PLN is reinforcing its commitment to decarbonization, ensuring a sustainable energy future, and accelerating Indonesia's transition toward renewable energy sources.

Long-Term Decarbonization Roadmap

Until 2030, PLN aims to align its emissions reduction strategy with Indonesia's NDC by implementing the ARED strategy. This approach is expected to reduce GHG emissions by approximately 99 million tons of CO_2e compared to the BAU scenario. Over the long term, PLN aims to achieve NZE by 2060, which will entail a 100% reduction in GHG emissions intensity from 0.89 tons of CO_2e/MWh in 2021 to zero by 2060. Absolute GHG emissions in the long term are targeted to reach zero by 2060, representing a cumulative reduction of 1.057 million tons of CO_2e compared to the BAU trajectory.

According to the RUPTL, PLN's short-to-medium-term goal is to reduce GHG emissions intensity across all scopes by 15.7% by 2030. By 2028, the company aims to cut GHG emissions by approximately 88.00 $mtCO_2$ compared to the BAU scenario and achieve an emissions intensity of around 0.788 tCO/MWh. These intermediate targets are strategically aligned with the PLN's overarching and long-term goal of achieving NZE by 2060.

Table 17 GHG Emissions Reduction Target (million tons CO_2e)

Initiatives	2024		2023		2022
	Target	Realization	Target	Realization	Realization
Addition of NRE Generation	3.1	4.2	1.9	3.4	2
CCT	4.2	4.6	3.9	4.2	2.8
Conversion from Gas-Fired Power Plants to Combined Cycle Power Plants	0.9	2.1	0.5	1.1	0.6
Biomass Co-firing	2.6	1.8	0.6	1.1	0.6
Total GHG Emission Reduction	10.8	12.7	6.9	9.7	6

Based on **Table 17**, in 2024 PLN's decarbonization program successfully reduced GHG emissions by 12.7 million tons CO_2, surpassing the targeted reduction of 10.8 million tons CO_2. The most significant contribution came from the implementation of Clean Coal Technology which accounted for a reduction of 4.6 million tons of CO_2. Looking forward, PLN aims to further enhance its GHG reduction initiatives with a target of reducing 51 million tons of CO_2e in 2025. This target is aligned with Indonesia's E-NDC, using 2010 as the baseline year.

Table 18 GHG Emissions Reduction from Green Business Strategy Initiatives (10^3 tons CO_2)

Initiatives	2024	2023	2022
	Realization	Realization	Realization
SPKLU	15.6	4.2	0.7
Solar Panel Rooftop	23.4	23.4	16.8
B30 (Biofuel)	1,769.3	1,531.2	1,314.6
Total GHG Emission Reduction	1,808.3	1,558.9	1,332.1

In addition to its E-NDC targets, PLN continues to advance its green business strategy through initiatives such as SPKLU development, rooftop solar installations, and the biofuel program. While these efforts are not yet linked to specific emission reduction targets, PLN has set a clear roadmap for their projected growth. Based on **Table 18**, these initiatives reduced GHG emissions by 1.8 million tons CO_2e in 2024, an increase from 1.6 million tons recorded in 2023. This reflects PLN's proactive role in supporting the national energy transition and delivering measurable climate benefits.

Table 19 Emission Intensity based on Electricity Production for Generation Activities

Carbon (Ton CO_2e/MWh)	2024		2023		2022
	Target	Realization	Target	Realization	Realization
Scope 1 Emission Intensity	N/A	0.80	N/A	0.79	0.78
Scope 2 and 3 Emission Intensity	N/A	0.75	N/A	0.74	0.72
Scope 1, 2, and 3 GHG Emission Intensity	0.80	0.77	0.86	0.77	0.76

Notes: N/A = Emissions intensity target is the aggregated target of scope 1, 2, and 3.

Each year, PLN sets a consolidated target for total GHG of emission intensity that encompasses Scope 1, 2, and 3 rather than setting individual targets for scope. Based on **Table 19**, the GHG emission intensity from generation activities was 0.774 tons CO_2e/MWh in 2024. While this was below the 2024 target set it still marked a slight increase compared to 2023 levels, which was 0.770 tons CO_2e/MWh. As established in 2023, PLN's emission intensity target for 2025 is set at 0.79 tons CO_2e/MWh, in alignment with the RKAP (Work Plan and Budget) projection for generation activities.

PLN Initiatives to Reduce the Emission

As outlined in the Strategy section, PLN has defined the timeframes for its short- and long-term targets. **Table 20** below presents emission reduction targets for the short term (2025–2026) and the medium term (2027–2030).

Table 20 PLN's Short-term and Medium-term Initiatives

Initiatives	Emission Reduction Target		Progress	Future Plan
	Short	Medium		
Increase New Renewable Energy Power Capacity by 20.9 GW.	Target 2025: 18.2 million tons of CO_2 emissions.	Target 2030: 97 million tons of CO_2.	As of 2024, 1.3 GW of renewable energy projects have been completed, with an additional 3.4 GW currently under construction.	Target 2025: an additional 816.79 MW of renewable capacity and In 2030, PLN has set a target of 51.6% or 20.93 GW for renewable power plants, including: 1. 10.4 GW from hydroelectric plants 2. 3.4 GW from geothermal plants 3. 4.7 GW from solar photovoltaic plants 4. 1.9 GW from other renewable sources 5. 0.6 GW from bio-source
Biomass Co-Firing Program for Existing Coal-Fired Power Plant (CFPP).	Biomass consumption target for 2025 is 3 million tons, with a potential emission reduction of 3.6 million tCO_2e.	The emission reduction target for 2030 is 8.8 million tCO_2.	Implemented at 47 CFPPs. Biomass consumption increased by 70%, from 0.99 million tons in 2023 to 1.62 million tons in 2024, still below the target of 2.2 million tons.	By 2025: implemented at 52 CFPPs with a total capacity of 10.6 GW.
Clean Coal Technology (CCT) Clean Coal Technology (CCT)	Target 2025: a reduction of 16.3 million tons of CO_2 emissions.	Emission reduction target for 2030 is 7.66 million tons of CO_2.	Focus on implementing Ultra Super Critical (USC) technology in coal-fired power plants to enhance efficiency and reduce emissions. By 2024, emissions were reduced by 13.9 million tons of CO_2.	Capacity addition target by 2025: 2,000 MW
Gas Expansion	Target 2025: a reduction of 12.8 million tons of CO_2 emissions.	Emission reduction target for 2030 is 13.7 million tons of CO .	In 2024, emissions were successfully reduced by 2 million tons of CO_2, exceeding the initial target. Flagship project: Cilamaya Jawa 1 Gas and Steam Power Plant (PLTGU).	Capacity addition target by 2025: 1,015.01 MW Cumulative capacity addition target by 2030 is 24.5 GW.
Energy Efficiency & Grid Loss Improvement	N/A	N/A	Transmission and distribution losses decreased from 9.91% in 2013 to 8.55% in 2024.	Operational optimization, infrastructure modernization, and adoption of technologies such as Advanced Metering Infrastructure (AMI) and real-time monitoring are being pursued. Although there is no official target for energy efficiency, PLN continues to strive for efficient transmission and distribution of electricity in the midst of massive development of power plants, transmission, and other infrastructure

PLN has not yet set a quantified emissions reduction target for its long-term strategy; however, it has developed a comprehensive roadmap for each of its key initiatives. This roadmap outlines the implementation timeline and the projected contributions of each initiative to the overall decarbonization pathway. These initiatives include CCS/CCUS, hydrogen and ammonia technologies, and nuclear power plants. Currently, only CCS/CCUS has a defined emissions reduction target.

1. CCS/CCUS
   PLN is advancing its CCS/CCUS initiatives through ongoing feasibility studies at 4 coal-fired and 2 combined-cycle power plants, in collaboration with partners such as JERA, Carbon Korea, INPEX, Medco, and GE. A total of 37 GW of coal-fired capacity has been identified as suitable for CCS integration, with a 1 GW pilot project currently in development. According to the CCS/CCUS Implementation Roadmap, carbon dioxide emissions reductions from CCS/CCUS are projected to increase from 12.63 million tons in 2035 to 122.36 million tons by 2060.
2. Low Carbon Fuels Hydrogen and Ammonia
   PLN has made significant progress in green hydrogen production, achieving an annual production capacity of 199 tons. Since late 2022, Green Hydrogen Plants have been operating at 21 sites across Sumatra, Java, and Bali. In February 2024, Indonesia's first Hydrogen Refueling Station was launched in Senayan, marking a milestone in the transition toward hydrogen use in both power generation and transportation. PLN plans to initiate additional hydrogen production projects in 2025, with gradual scaling expected between 2030 and 2035.
3. New Energy Power Plant: Nuclear
   Indonesia is currently in Phase 1 of nuclear power development, guided by the International Atomic Energy Agency (IAEA). This phase includes the establishment of the Nuclear Energy Program Implementing Organization (NEPIO) to evaluate feasibility and readiness. The development of the country's first nuclear power plant involves a complex preparation process expected to span approximately 15 years prior to its first commercial operation. PLN targets a total nuclear capacity of 2.4 GW by 2040.

GOVERNANCE, BUSINESS AND OPERATIONAL TARGETS

Diesel Power Plant Conversion Program

To support its GHG reduction goals, PLN is implementing a diesel-to-renewable energy conversion program. Currently, PLN operates 5,200 diesel power plants across 2,130 locations in Indonesia, with a total capacity of 1,873 MW. A total of 631 of these locations are 3T areas (regions that classified as frontier (*terdepan*), outermost (*terluar*), and least developed (*tertinggal*). These areas often face limited access to infrastructure, public services, and economic opportunities, making them a focus for inclusive development and electrification efforts.

Stage 1: PLN plans to convert up to 116 MW of PLTD across Indonesia with PLTS. In this conversion, PLTS will serve as the base load, supported by battery systems to enable 24-hour operation. In the first phase, the installed capacity is expected to reach around 162 MWp of solar and 423 MWh of battery energy storage (BESS). This initiative will increase the share of renewable energy and boost national installed capacity. By the end of 2024, the expected milestone is the completion of the pricing approval process from the Ministry of Energy and Mineral Resources.

Stage 2: 135 MW of PLTD capacity will be converted to BESS Hybrid PLTS with PLTD, with the addition of 125 MWp PLTS and 184 MWh BESS. There are 118 conversion locations in phase II. By the end of 2024, the expected milestone is the completion of tender documents, with the procurement process to follow once Phase I contracts are finalized.

Stage 3: The capacity of 369 MW PLTD will be converted into PLTS, BESS, and other EBT Hybrid with PLTD according to the superior natural resources in the area and the best economics. There are 419 third stage conversion locations. By the end of 2024, the program is expected to reach the feasibility study stage.

POWER PLANT & SUB-STATION RISK RATING AS CLIMATE ADAPTATION METRICS

Power Plant Risk Rating

Since 2012, PLN has implemented the Power Plant Risk Rating to enhance operational resilience and sustainability across its generation assets. This initiative aims to: (i) identify physical risks at each power plant operated by PLN and its subsidiaries; (ii) develop targeted risk management action plans; and (iii) ensure the preparedness and long-term sustainability of power plant operations. The rating framework covers aassesses a comprehensive range of risk aspects, including:

1. Natural and allied perils
2. Design and layout
3. Utility hazard
4. Process control
5. Loss prevention
6. Business interruption exposure
7. Management: process and equipment integrity
8. Management: operation
9. Management: risk management
10. Management: commitment to safety

Climate-related risks, particularly extreme weather and flooding are considered under the natural and allied perils category. This assessment is guided by the Indonesia Natural Hazard Map to ensure alignment with nationally recognized hazard profiles.

To standardize the evaluation and support decision-making, PLN applies a structured scoring system that classifies power plants according to their total risk exposure as shown in **Table 21**.

Table 21 Power Plant Risk Rating - Scoring System

Score	Total Score Range	Criteria
0	0–42	Good
1	43–84	Above Average
2	85–125	Average
3	126–168	Below Average
4	169–208	Critical

Based on this scoring system, as of December 2024, a total of 216 power plants have undergone risk assessment using this methodology, as shown in **Figure 32**.

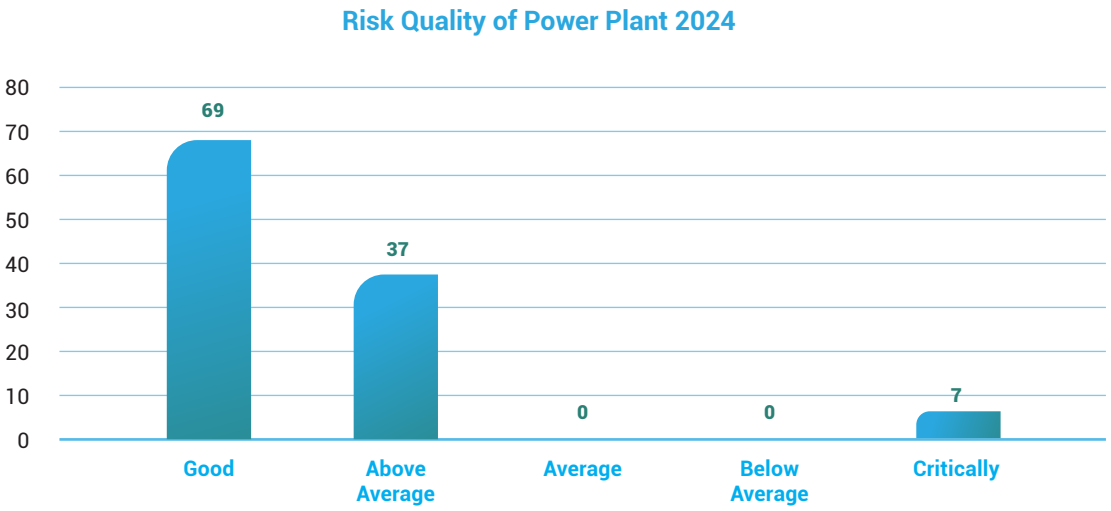


Figure 32 Risk Quality of Power Plant 2024

Substation Risk Rating

To strengthen asset-level climate and operational risk management, in 2023 PLN introduced the Sub-Station Risk Rating, complementing the earlier Power Plant Risk Rating system. This initiative enhances PLN's ability to identify vulnerabilities, improve resilience, and maintain reliable electricity infrastructure. The assessment framework evaluates a wide range of operational and environmental risk parameters, including:

1. Preventive Action: Enhancing Operational Readiness
   Preventive controls focus on strengthening the substation's ability to withstand potential disruptions from climate-related events such as heatwaves, lightning strikes, or grid stress during peak demand. Key elements include:
   - Business Interruption Readiness: Assessed through the availability of backup transformers, critical spare parts, and resilient system configurations.
   - Risk Identification and Management of Change (MoC): Substations are evaluated on their ability to anticipate and adapt to process risks, environmental hazards, and operational changes, supported by updated Material Safety Data Sheets (MSDS) and hazard identification tools.
   - Operational Discipline and Human Resources: PLN ensures that substations are supported by trained personnel, comprehensive operation and maintenance procedures, and housekeeping practices that minimize fire and equipment risks.
   - QHSE System Integration: Standard operating procedures, work permits, contractor oversight, and internal safety audits are embedded to ensure personnel and environmental safety, particularly under increasing climate volatility.

2. Corrective Action: Incident Response Capability
   PLN assesses the of each substation's resiliency and ability to implement corrective measures to mitigate the impact of emergencies, especially those triggered or exacerbated by extreme climate events.
   - Fire Protection Systems: Evaluated across six dimensions, including the availability of mobile and fixed suppression systems, passive protections (fireproof structures), and early warning systems (smoke, fire, gas detectors).
   - Mutual Aid Arrangements: Partnerships with local emergency services and other PLN units facilitate rapid response during disasters.
   - Incident Investigation & Knowledge Sharing: Events are recorded, analyzed, and communicated to support a culture of learning and continuous improvement in climate-related incident management.

3. Emergency Response Planning: Scenario-Based Preparedness
   PLN maintains and tests a structured Emergency Response Plan (ERP) at the substation level, with clear procedures and trained personnel to manage events such as flooding, landslides, wildfires, or technical failure due to extreme weather.

   - Each ERP includes scenario-based response plans, resource allocation strategies, and regular emergency drills to ensure readiness and operational continuity.
   - These preparedness activities are especially critical for substations in high-risk locations as identified through hazard mapping.

PLN utilizes a structured scoring system to standardize evaluations and support decision-making, classifying substations based on their total risk exposure as shown in **Table 22**.

Table 22 Substation Risk Rating - Scoring System

Score	Total Score Range	Criteria
0	0–0.80	Good
1	0.81–1.60	Above Average
2	1.61–2.40	Average
3	2.41–3.20	Below Average
4	3.21–4	Critical

Based on this scoring system, as of December 2024, a total of 60 substation has been assessed. The results of the risk quality substation in 2024 are shown in **Figure 33**.

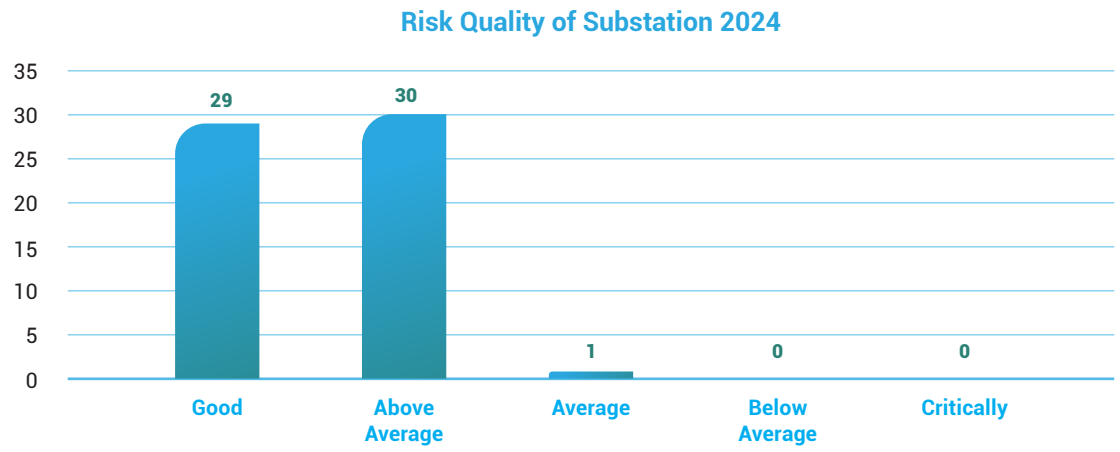


Figure 33 Risk Quality of Substation 2024

06

FUTURE PLAN

FUTURE PLAN

Moving forward, we plan to enhance our disclosures by incorporating more investor-focused information, aiming to better meet stakeholder expectations. We will also refine our risk analysis by quantifying potential risk impacts and strengthening the alignment with corporate risk profile governance. Additionally, we are preparing for the adoption of Indonesia's sustainability disclosure standards, PSPK 1 and PSPK 2, to ensure compliance and transparency in our sustainability reporting.

07

ATTACHMENT

ATTACHMENT

IFRS S2 Alignment

Main Elements	IFRS S2 Climate-related-Disclosures	Pages
Governance	Describe the governance body for oversight of climate-related risks and opportunities	10
	Describe management's role in the governance processes, controls and procedures used to monitor, manage and oversee climate-related risks and opportunities	12
Strategy	Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term	29
	Describe business model and value chain based on climaterelated risks and opportunities	34
	Describe strategy and decision-making based on how the entity responds to climate-related risks and opportunities	44
	Describe financial position, financial performance, and cash flows over the short, medium, and long-term (anticipated financial efects of climate-related risks and opportunities)	54
	Describe the entity climate resilience strategy, how and when the climate-related scenario analysis was carried out	31
Risk Management	Describe the process and related policies uses to identify, assess, prioritize, and monitor climate-related risks	19
	Describe the processes the entity uses to identify, assess, prioritizing, and monitor climate-related opportunities	29
	Describe how the processes for identifying, assessing, prioritising, and monitoring climate-related risks are integrated into organization's overall risk management	29
Metrics & Targets	Disclose about information relevant to the cross-industry metric categories (greenhouse gas (GHG), climate-related transition and physical risks and opportunities, capital deployment, internal carbon prices, and remuneration)	59 - 64
	Disclose industry-based metrics that are associated with the particular business models, activities, or other common features that characterise participation in an industry	45
	Disclose targets set by the entity including metrics uses by the management, target required to meet the regulation, mitigate, or adapt to climate-related risks and opportunities	65

Transition Task Force (TPT) Alignment

Sub Element	TPT's Disclosure Framework	Report Section
1.1 Strategic Ambition	An entity shall disclose the Strategic Ambition of its transition plan. This shall comprise the entity's objectives and priorities for responding and contributing to the transition towards a low-GHG emissions, climate-resilient economy, and set out whether and how the entity is pursuing these objectives and priorities in a manner that captures opportunities, avoids adverse impacts for stakeholders and society, and safeguards the natural environment.	Navigating Climate-related Opportunities, Strategic Decision-making , Our Climate Change Initiatives
1.2 Business model and value chain	An entity shall disclose a description of the current and anticipated implications of the entity's Strategic Ambition on its business model and value chain	Climate-related Effects On Business Model And Value Chain

Sub Element	TPT's Disclosure Framework	Report Section
1.3 Key assumptions and external factors	An entity shall disclose key assumptions that it has made and external factors on which it depends in order to achieve the Strategic Ambition of its transition plan.	Climate-related Transition Risks
2.1 Business operations	An entity shall disclose information about the short-, medium-, and long-term actions it is taking or plans to take in its business operations in order to achieve the Strategic Ambition of its transition plan.	Our Climate Change Initiatives
2.2 Products and services	An entity shall disclose information about short-, medium-, and long-term actions it is taking or plans to take to change its portfolio of products and services in order to achieve the Strategic Ambition of its transition plan.	Our Climate Change Initiatives
2.3 Policies and conditions	An entity shall disclose information about any policies and conditions that it uses or plans to use in order to achieve the Strategic Ambition of its transition plan.	Strategic Decision-making
2.4 Financial planning	An entity shall, to the extent the financial effects of its transition plan are separately identifiable, disclose information about the effects of its transition plan25 on its financial position, financial performance and cash flows26 over the short-, medium-, and long-term, including information about how it is resourcing or plans to resource its activities in order to achieve the Strategic Ambition of its transition plan.	Financial Position, Performance, And Cash Flows
3.1 Engagement with value chain	An entity shall disclose information about any engagement activities with other entities in its value chain that it is undertaking or plans to undertake in order to achieve the Strategic Ambition of its transition plan.	Engagement Strategy - Engagement with value chain
3.2 Engagement with industry	An entity shall disclose information about any engagement and collaborative activities with industry counterparts (and other relevant initiatives or entities) that it is undertaking or plans to undertake in order to achieve the Strategic Ambition of its transition plan.	Engagement Strategy - Engagement with Industry
3.3 Engagement with government, public sector and civil society	An entity shall disclose information about any direct and indirect engagement activities with the government, regulators, public sector organisations, communities, and civil society that it is undertaking or plans to undertake in order to achieve the Strategic Ambition of its transition plan	1. Engagement Strategy - Engagement with Regulators 2. Engagement Strategy - Engagement with the community
4.1 Governance, business and operational metrics and targets	An entity shall disclose information about the governance, engagement, business and operational metrics and targets that it uses in order to drive and monitor progress towards the Strategic Ambition of its transition plan, and report against these metrics and targets on at least an annual basis.	Governance, Business And Operational Targets
4.2 Financial metrics and targets	An entity shall disclose information about any financial metrics and targets, relevant to its business, sector, and strategy, that it uses in order to drive and monitor progress towards the Strategic Ambition of its transition plan, and report against these metrics and targets on at least an annual basis.	Financial Position, Performance, And Cash Flows
4.3 GHG metrics and targets	An entity shall disclose information about the GHG emissions and removals metrics and targets that it uses in order to drive and monitor progress towards the Strategic Ambition of its transition plan, and report against these metrics and targets on at least an annual basis	Climate-related Targets
4.4 Carbon credits	An entity shall disclose information about how it uses or plans to use carbon credits to achieve the Strategic Ambition of its transition plan, and report on the use of carbon credits on at least an annual basis.	Carbon Economic Value (Carbon Pricing)

Sub Element	TPT's Disclosure Framework	Report Section
5.1 Board oversight and reporting	An entity shall disclose information about the governance body(s) (which can include a board, committee, or equivalent body charged with governance) or individual(s) responsible for oversight of the transition plan.	Sustainability Committee - Board Oversight & Sustainability Committee
5.2 Roles, responsibility and accountability	An entity shall disclose information about management's role in the governance processes, controls, and procedures used to monitor, manage, and oversee the transition plan, as well as how it is embedded within the entity's wider control, review, and accountability mechanisms.	Sustainability Committee – Role of Management
5.3 Culture	An entity shall disclose information about how it aligns or plans to align its culture with the Strategic Ambition of its transition plan	Promoting A Culture Of Sustainability
5.4 Incentives and remuneration	An entity shall disclose information about how it aligns or plans to align its incentive and remuneration structures with the Strategic Ambition of its transition plan.	-
5.5 Skills, competencies and training	An entity shall disclose information about actions it is taking or plans to take to assess, maintain, and build the appropriate skills, competencies, and knowledge across the organisation in order to achieve the Strategic Ambition of its transition plan	Promoting A Culture Of Sustainability - Skills, Competencies And Training

POWER PLANT PROJECT RELATED TO ENERGY TRANSITION

Power Plant Project related to ARED Scheme

No	Province	Power Plant	Type	Capacity (MW)	Commercial Operation Date
1	Aceh	Kumbih-3	Hydro	45	2025
2	Aceh	Pembangkit Bayu	Wind	55	2024
3	Aceh	Pembangkit Bayu	Wind	55	2025
4	North Sumatera	Asahan III (FTP2)	Hydro	2 x 87	2024
5	North Sumatera	PLT Surya Nias	Solar	6	2025
6	North Sumatera	PLT Surya Nias	Solar	10	2028
7	North Sumatera	PLT Surya Nias	Solar	10	2029
8	North Sumatera	Simonggo	Hydro	90	2029
9	North Sumatera	Sumatera Pump Storage-1	Pump storage/Hydro	250	2029
10	North Sumatera	Sumatera Pump Storage-2	Pump storage/Hydro	250	2030
11	North Sumatera	Pembangkit Bayu	Wind	55	2024
12	North Sumatera	Pembangkit Bayu	Wind	55	2025
13	West Sumatera	Masang-2 (FTP2)	Hydro	44	2027
14	Jambi	Sungai Penuh (FTP2)	Geothermal	55	2028
15	South Sumatera	Danau Ranau (FTP2)	Geothermal	20	2028
16	South Sumatera	Tanjung Sakti	Geothermal	114	2029
17	Bengkulu	Hululais (FTP2)	Geothermal	2 x 55	2025

No	Province	Power Plant	Type	Capacity (MW)	Commercial Operation Date
18	Bengkulu	Kepahiang #1	Geothermal	55	2028
19	Bengkulu	Kepahiang #2	Geothermal	55	2028
20	West Kalimantan	Kalbar Remote Area Electricity	Solar	23.1	2024
21	West Kalimantan	Kalbar	Solar	30	2025
22	West Kalimantan	Tepuai	Minihydro	2	2025
23	West Kalimantan	Nanga Pinoh	Hydro	100	2029
24	East Kalimantan	Kaltim Remote Area Electricity	Solar	3.2	2024
25	East Kalimantan	Kelai	Hydro	55	2025
26	East Kalimantan	Lambakan	Hydro	18.2	2025
27	East Kalimantan	Tabang	Hydro	90	2028
28	North Kalimantan	Kaltara Remote Area Electricity	Solar	1.01	2024
29	North Kalimantan	Sesayap	Hydro	90	2028
30	North Kalimantan	Kaltimra	Hydro	200	2029
31	North Kalimantan	Kaltimra	Hydro	100	2030
32	Banten	Banten	Wind	100	2024
33	Banten	Banten	Wind	100	2025
34	Banten	Spread Jawa-Bali (Kuota)	Solar	80	2025
35	Banten	Spread Jawa-Bali (Kuota)	Solar	25	2030
36	West Java	Spread Jawa-Bali (Kuota)	Solar	100	2024
37	West Java	Spread Jawa-Bali (Kuota)	Solar	180	2025
38	West Java	Upper Cisokan Pump Storage (FTP2)	Pump storage/Hydro	260	2025
39	West Java	Upper Cisokan Pump Storage (FTP2)	Pump storage/Hydro	260	2025
40	West Java	Upper Cisokan Pump Storage (FTP2)	Pump storage/Hydro	260	2025
41	West Java	Tangkuban Perahu (FTP2)	Geothermal	20	2026
42	West Java	Tangkuban Perahu (FTP2)	Geothermal	20	2026
43	Central Java	Karimunjawa	Solar	3	2024
44	Central Java	Spread Jawa-Bali (Kuota)	Solar	190	2025
45	Central Java	Ungaran (FTP2)	Geothermal	55	2026
46	Central Java	Matenggeng PS	Pump storage/Hydro	235.8	2028
47	Central Java	Matenggeng PS	Pump storage/Hydro	235.8	2028
48	Central Java	Matenggeng PS	Pump storage/Hydro	235.8	2028
49	Central Java	Matenggeng PS	Pump storage/Hydro	235.8	2028
50	Central Java	Spread Jawa-Bali (Kuota)	Solar	40	2030
51	East Java	Bawean	Solar	5	2024
52	East Java	Spread Jawa-Bali (Kuota)	Solar	100	2024
53	East Java	Spread Jawa-Bali (Kuota)	Solar	250	2025
54	East Java	Sepanjang	Solar	0.5	2027
55	East Java	Spread Jawa-Bali (Kuota)	Solar	50	2030

No	Province	Power Plant	Type	Capacity (MW)	Commercial Operation Date
56	East Java	Grindulu	Pump storage/Hydro	250	2030
57	East Java	Grindulu	Pump storage/Hydro	250	2030
58	East Java	Grindulu	Pump storage/Hydro	250	2030
59	East Java	Grindulu	Pump storage/Hydro	250	2030
60	Bali	Spread Jawa-Bali (Kuota)	Solar	25	2025
61	Bali	Spread Jawa-Bali (Kuota)	Solar	25	2030
62	North Sulawesi	Sawangan	Hydro	16.6	2026
63	Central Sulawesi	Remote Area Electricity	Solar	0.51	2024
64	Central Sulawesi	Buleleng	Minihydro	1.2	2024
65	Central Sulawesi	Halulai	Minihydro	1.2	2028
66	South Sulawesi	Remote Area Electricity	Solar	11.185	2024
67	South Sulawesi	Bakaru 2	Hydro	2 x 70	2025
68	South Sulawesi	Poko	Hydro	3 x 41.5	2026
69	Southeast Sulawesi	Lapai 1	Minihydro	2 x 2.65	2025
70	Southeast Sulawesi	Lapai 2	Minihydro	2 x 2	2025
71	Southeast Sulawesi	Riorita	Minihydro	2 x 1.335	2025
72	Southeast Sulawesi	Watunohu	Hydro	22	2026
73	Southeast Sulawesi	Konawe (Bendungan Pelosika PUPR)	Hydro	21	2028
74	West Sulawesi	Bonehau	Minihydro	4	2024
75	Maluku	Tulehu (FTP2)	Geothermal	2 x 10	2025/26
76	Maluku	Bula	Solar/Battery	5	2030
77	Maluku	Saparua 2	Solar/Battery	5	2027
78	Maluku	Nua (Masohi)	Minihydro	2 x 4.4	2026
79	Maluku	Spread Seram (Kuota)	Minihydro	7.8	2026
80	Maluku	Wae Mala	Minihydro	1.1	2026
81	Maluku	Wai Tala	Hydro	2 x 27	2029
82	North Maluku	Songa Wayaua (FTP2)	Geothermal	10	2025/27
83	Papua	Wabudori	Minihydro	3	2029
84	Papua	Remote Area Electricity	Solar	0.97	2024
85	Papua	Remote Area Electricity	Solar	1.57	2025
86	Papua	Remote Area Electricity	Solar	1.68	2026
87	Papua	Remote Area Electricity	Solar	1.7	2027
88	Papua	Remote Area Electricity	Solar	2.0603	2028
89	Papua	Remote Area Electricity	Solar	2.299	2028
90	Papua	Remote Area Electricity	Solar	1.628	2030
91	Papua	Orya 2	Hydro	14	2026
92	Papua	Amai	Minihydro	1.08	2028
93	Papua	Merauke 3	Biomass	10	2024

No	Province	Power Plant	Type	Capacity (MW)	Commercial Operation Date
94	Papua	Kalibumi I	Minihydro	6.35	2025
95	Papua	Digoel	Minihydro	3	2029
96	Papua	Sarmi	Solar + Battery	5	2029
97	Papua	Serui	Solar + Battery	5	2026
98	Papua	Timika	Solar + Battery	10	2025
99	Papua	Cascade Walesi	Minihydro	6	2024
100	Papua	Uwe	Minihydro	1.5	2024
101	Papua	Walesi Blok II	Minihydro	3.8	2026
102	Papua	Baliem	Hydro	10	2029
103	West Papua	Remote Area Electricity	Solar	0.69	2024
104	West Papua	Remote Area Electricity	Solar	0.68	2025
105	West Papua	Remote Area Electricity	Solar	0.57	2026
106	West Papua	Remote Area Electricity	Solar	0.42	2027
107	West Papua	Kaimana 2	Biomass	10	2028
108	West Papua	Warnasi Warkapi	Minihydro	4.6	2025
109	West Papua	Manokwari	Solar + Battery	15	2029
110	West Papua	Waigo	Minihydro	1.3	2029
111	West Nusa Tenggara	Spread Lunyuk (Kuota)	Solar	2	2024
112	West Nusa Tenggara	Spread Lunyuk (Kuota)	Solar	2	2028
113	West Nusa Tenggara	Spread Sumbawa-Bima (Kuota)	Geothermal	10	2029
114	East Nusa Tenggara	Sumba	Solar	5	2024
115	East Nusa Tenggara	Sumba	Solar	5	2024
116	East Nusa Tenggara	Atadei (FTP2)	Geothermal	2 x 5	2024/26
117	East Nusa Tenggara	Spread Flores (Kuota)	Minihydro	5	2025
118	East Nusa Tenggara	Sumba	Minihydro	5	2025
119	East Nusa Tenggara	Ulumbu 5	Geothermal	20	2025
120	East Nusa Tenggara	Mataloko (FTP2)	Geothermal	2 x 10	2025/26
121	East Nusa Tenggara	Sumba	Solar	5	2026
122	East Nusa Tenggara	Sumba	Solar	5	2026
123	East Nusa Tenggara	Ulumbu 6	Geothermal	20	2027
124	East Nusa Tenggara	Oka Ile Ange (FTP2)	Geothermal	10	2028
125	East Nusa Tenggara	Rote	Solar	1	2028
126	East Nusa Tenggara	Sumba	Solar	5	2028
127	East Nusa Tenggara	Sumba	Solar	5	2028
128	East Nusa Tenggara	Gunung Sirung	Geothermal	5	2029
129	East Nusa Tenggara	Sumba	Solar	5	2030
130	East Nusa Tenggara	Sumba	Solar	5	2030

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