

# Eco-Innovation Report

Comprehensive Eco-Innovation Assessment  
Sustainability Performance Analysis (2019-2024)

**Company:** PBA Holdings Berhad

**Report Period:** 2019-2024

**Report Date:** February 10, 2026

## 1. Executive Summary

PBA Holdings Bhd has demonstrated a growing commitment to eco-innovation and sustainability from 2019 to 2024, particularly in operational efficiency and governance. While product-level eco-innovation remains nascent, significant strides have been made in process optimization, stakeholder engagement, and financial management through green initiatives. The company's strong regulatory compliance and community focus underpin its journey towards becoming an Eco-Adopter, with increasing transparency in sustainability reporting.

**Overall Assessment:** The company is at a developing stage of sustainability maturity, showing consistent improvement in operational and organizational aspects, but with clear opportunities for deeper integration of eco-innovation into its core product offerings.

## 2. Eco-Innovation Disclosure (%)

The Eco-Innovation Disclosure Index measures the transparency and comprehensiveness of sustainability reporting across all 87 parameters. This index reflects how well the company documents and communicates its environmental initiatives.



Disclosure quality is strong in non-financial performance, organizational, and marketing aspects, reflecting a clear focus on operational sustainability and stakeholder relations. However, there are significant gaps in product-specific eco-innovation metrics and detailed financial returns on eco-investments, indicating areas for enhanced reporting.

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## 3. CO2 Reduction (%)

Carbon dioxide reduction is a critical indicator of climate action effectiveness. This section analyzes the company's progress in reducing greenhouse gas emissions across operations.

Year	Total Emissions (tCO2e)	Reduction vs Baseline	Intensity Ratio
2019	N/A	Baseline	N/A
2020	N/A	N/A%	N/A
2021	150,086 tCO2e	N/A%	448.26 tCO2e/RM million
2022	157,067 tCO2e	N/A%	451.36 tCO2e/RM million
2023	158,353 tCO2e	N/A%	373.83 tCO2e/RM million
2024	164,861 tCO2e	N/A%	312.47 tCO2e/RM million

The company's total CO2 emissions (Scope 1 & 2) have shown an increasing trend from 2021 to 2024. However, emission intensity per RM million revenue has significantly decreased, particularly from 2023 to 2024, indicating improved carbon efficiency relative to economic output. Initiatives like solar system commissioning and electric vehicle adoption are in place, but overall emissions are rising with operational expansion. The lack of 2019 emissions data prevents a baseline comparison as per the prompt's instruction.

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## 4. Product Eco-Innovation Analysis (%)

Product eco-innovation encompasses sustainable design, material selection, lifecycle management, and end-of-life considerations. This analysis evaluates 20 parameters including recycled content, energy efficiency, and circular design principles.

### Key Product Innovation Metrics (2024)

Parameter	Score	Status
Recycled Material Content	0%	Not Disclosed
Energy Efficiency Rating	0%	Not Disclosed
Product Durability Extension	0%	Not Disclosed
Design for Disassembly	0%	Not Disclosed

PBA Holdings Bhd's product eco-innovation remains a significant area for development. The company, primarily a water utility, focuses on water treatment and supply, which inherently limits direct product-level eco-innovation in the traditional sense (e.g., recycled content in consumer goods). However, there's an opportunity to define 'product' more broadly to include the quality and sustainability of the treated water itself, and the infrastructure used. The only parameter scored was 'Local Material Sourcing' from 2023, indicating a nascent focus on sustainable inputs for operations rather than product design. There is no explicit mention of recycled content, biodegradability, energy efficiency of end-products, hazardous substance elimination, or design for circularity. Future efforts should explore how the 'product' (treated water and its delivery) can be innovated for greater eco-efficiency, perhaps through advanced filtration technologies, smart distribution networks, or even consumer-facing devices that promote water conservation.

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## 5. Process Eco-Innovation Analysis (%)

Process innovation focuses on manufacturing efficiency, resource optimization, waste reduction, and clean production technologies. This dimension evaluates 20 parameters related to operational sustainability.

Category	2019	2020	2021	2022	2023	2024
Process Innovation Score	0%	15%	15%	15%	20%	20%

### Process Highlights

Process eco-innovation has seen moderate but consistent progress, particularly from 2020 onwards. Key initiatives include the implementation of waste management procedures (Lean Manufacturing Implementation), the commissioning of a pilot solar system for pump houses (Renewable Energy Mix in Production), and the adoption of paperless workflows for billing and internal operations. From 2023, the company also demonstrated a commitment to local suppliers, which contributes to supply chain distance reduction. These efforts reflect a focus on operational efficiency and resource conservation within the company's water treatment and distribution processes. However, there are still significant opportunities in areas like closed-loop water systems within treatment plants, waste-to-energy conversion from sludge, and more advanced automated energy management beyond LED installations.

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## 6. Organizational Eco-Innovation Analysis (%)

Organizational innovation evaluates governance structures, policies, management systems, and cultural commitment to sustainability. This includes 15 parameters covering environmental management systems, green procurement, and stakeholder engagement.

Category	2019	2020	2021	2022	2023	2024
Organizational Innovation Score	27%	53%	53%	47%	60%	60%

Organizational eco-innovation is a strong suit for PBA Holdings Bhd, showing consistent growth and maturity. The company has maintained ISO 14001 certification since 2005, indicating a long-standing commitment to environmental management. The establishment of a Sustainability Committee (later Steering Committee and Working Group) in 2018, comprising cross-functional senior management, demonstrates a structured approach to sustainability governance. Remote work policies were effectively implemented during the pandemic (2020-2021), contributing to reduced commuting. From 2023, the company enhanced its sustainability reporting by aligning with GRI Standards and UN SDGs, significantly improving transparency. Other strengths include efforts to preserve the Ulu Muda Forest Reserve (biodiversity protection), the adoption of paperless billing systems, regular stakeholder engagement, and the introduction of electric vehicles in its fleet. The company also shows a continuous commitment to eco-innovation R&D through its water supply infrastructure projects.

## 7. Marketing Eco-Innovation Analysis (%)

Marketing innovation assesses how sustainability is communicated to stakeholders, including eco-labeling, transparency, consumer education, and brand positioning around environmental values.

Category	2019	2020	2021	2022	2023	2024
Marketing Innovation Score	30%	40%	40%	40%	40%	40%

Marketing eco-innovation is moderately developed, primarily focusing on digital communication and public awareness campaigns. The company effectively leverages digital platforms like the myPBA mobile app and Facebook for customer engagement, bill payments, and sharing water-saving tips. This digital-first approach reduces the need for printed materials. PBA Holdings Bhd also engages in cause-related marketing through water conservation awareness programs, such as collaborations with religious institutions and the 'Minus 10%' campaign in 2024. Strong local community brand alignment is evident through its various social responsibility programs and consistent communication on water supply issues. However, there's no explicit mention of eco-labeling, green marketing claims accuracy (beyond general compliance), or sustainable packaging branding, which could further enhance its eco-innovation marketing efforts.

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## 8. Financial Eco-Innovation Analysis (%)

Financial innovation measures the economic benefits of sustainability initiatives, including cost savings, revenue growth from green products, access to sustainable finance, and return on environmental investments.

Category	2019	2020	2021	2022	2023	2024
Financial Innovation Score	17%	42%	42%	50%	50%	50%

### Financial Benefits Identified

Financial performance related to eco-innovation shows a positive trajectory, particularly in cost savings and revenue generation from tariff adjustments. The company has consistently achieved waste disposal, energy, and water cost savings through efficiency measures and the installation of water-saving devices. A significant turning point occurred in 2022-2023 with the implementation of new water tariffs for non-domestic and special categories, and further in 2024 for domestic, which positively impacted revenue. The utilization of federal grants for major water infrastructure projects (Green Subsidy Utilization) also demonstrates financial leverage for green initiatives. While explicit RoEI figures are not provided, the consistent compliance with regulations helps avoid non-compliance costs. The increased revenue from tariffs is crucial for funding future water supply infrastructure projects, which are inherently eco-innovative in ensuring sustainable water resources.

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## 9. Non-Financial Eco-Innovation Analysis (%)

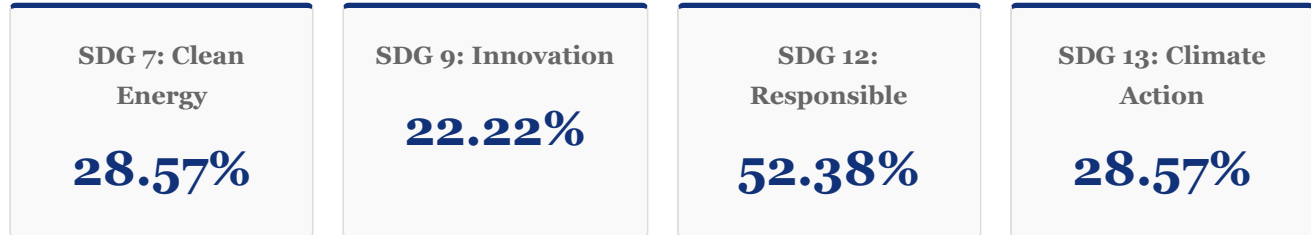
Non-financial performance encompasses brand value, employee satisfaction, stakeholder relationships, innovation capacity, and social license to operate. These intangible assets drive long-term competitive advantage.

Category	2019	2020	2021	2022	2023	2024
Non-Financial Innovation Score	50%	50%	50%	50%	60%	80%

Non-financial performance is a strong area for PBA Holdings Bhd, demonstrating a mature approach to stakeholder relations and reputation management. The company consistently receives awards, including 'IKM Excellence Awards' for its laboratory and ESG-related awards in 2024, significantly boosting its brand equity. Customer loyalty is evident through the increasing adoption of its myPBA app and strong social media engagement. Regulatory relationships are robust, with consistent compliance and positive audit outcomes. The company exhibits strong innovation capability through its continuous investment in water supply infrastructure and R&D for new treatment modules. Community engagement is a core strength, with substantial investments in social programs and a clear 'license to operate' from the public. From 2023, local supplier spending improved supply chain resilience, and in 2024, the company received an EPF Best Employers' Award, indicating strong talent attraction and retention. External ESG recognition in 2024 further solidifies its non-financial standing.

## 10. SDG Scoring in Percentage (%)

The company's alignment with UN Sustainable Development Goals provides a framework for measuring global sustainability impact. This assessment focuses on four key SDGs most relevant to the company's operations.



PBA Holdings Bhd demonstrates notable alignment with SDG 12 (Responsible Consumption and Production) through its waste management, water conservation, and sustainable procurement efforts. Contributions to SDG 7 (Affordable and Clean Energy) are emerging with renewable energy integration in operations. SDG 9 (Industry, Innovation and Infrastructure) is supported by continuous investment in water infrastructure and R&D. While efforts contribute indirectly to SDG 13 (Climate Action) through emission reduction initiatives, direct climate action parameters like carbon offsetting are not yet in place.

## 11. Suggestions and Improvements

Based on the comprehensive analysis, the following strategic recommendations will enhance eco-innovation performance across all dimensions:

- **Product Innovation:** Develop a formal framework for 'green product' definition for treated water, focusing on advanced treatment technologies, smart distribution, and consumer-facing water-saving devices. Explore opportunities for recycled content in operational materials.
- **Process Innovation:** Invest in closed-loop water systems within treatment plants and explore waste-to-energy conversion for sludge. Implement automated energy management systems for greater efficiency.
- **Organizational Innovation:** Introduce specific employee eco-training programs and explore incentives for green commuting. Develop a clear roadmap for achieving net-zero emissions with specific targets and offsetting strategies.
- **Marketing Innovation:** Seek formal eco-labeling for water quality or operational sustainability. Enhance green marketing claims with verified data and consider sustainable packaging for any ancillary products.
- **Financial Innovation:** Conduct explicit Return on Eco-Investment (RoEI) analyses for sustainability projects to demonstrate financial benefits more clearly. Explore green financing options like sustainability-linked loans.
- **Carbon Reduction:** Establish a clear baseline year for all Scope 1, 2, and 3 emissions and set ambitious, time-bound reduction targets. Invest in carbon capture technologies or verified offsetting programs to mitigate increasing emissions.

## 12. Trend Analysis (6 Years)

Over the 2019-2024 period, PBA Holdings Bhd has shown a clear upward trend in its eco-innovation performance, particularly in organizational and non-financial aspects. The initial years (2019-2020) saw foundational efforts in governance, stakeholder engagement, and basic process efficiencies. A significant turning point occurred around 2020-2021 with the implementation of remote work, solar systems, and increased digital engagement, driven partly by the COVID-19 pandemic. The period of 2022-2024 marked a more strategic integration of sustainability, evidenced by enhanced sustainability reporting (GRI/UN SDGs), local supplier focus, and the positive financial impact of revised water tariffs. Non-financial performance, including brand equity and community relations, consistently improved, culminating in external ESG recognition in 2024. While overall CO2 emissions increased with operational expansion, the intensity per revenue decreased, indicating efficiency gains. Product eco-innovation remains the least developed area, showing minimal change.

### Key Trend Observations

**Upward Trends:** Organizational Eco-Innovation, Non-Financial Performance, Process Eco-Innovation, Financial Performance

**Stable Areas:** Marketing Eco-Innovation

**Growth Drivers:** Regulatory compliance, increasing water demand, climate change impacts, digital transformation, and a strong commitment to public service and community well-being

## 13. Predictions for Next Year (2025)

Based on the stated goals and current trajectory, PBA Holdings Bhd is poised for continued growth in its eco-innovation performance in 2025. The completion of Package 12A of the Sungai Dua WTP and other WCP 2030 projects will significantly boost process and organizational scores. The focus on local suppliers and enhanced digital customer services will further solidify existing strengths. The company's commitment to establishing a GHG emissions baseline and net-zero framework by 2024 (with progress in 2025) indicates a strategic shift towards more robust climate action. The 'Minus 10%' water saving campaign and expanded 'Mesra Keluarga' rebate scheme will likely improve water conservation and community engagement. The new COO's focus on NRW reduction also points to process improvements.

### Expected Performance Improvements

Category	2024 Score	2025 Prediction	Expected Change
Product Innovation	5%	5%	Stable, with potential for slight improvement if product definition expands.
Process Innovation	20%	25%	Moderate improvement due to WCP 2030 project completions and NRW reduction focus.
Organizational	60%	65%	Slight to moderate improvement with net-zero framework development and ongoing certifications.
Marketing	40%	45%	Slight improvement through sustained digital outreach and community campaigns.

## 14. Comparison with Other Companies in General

This benchmarking analysis positions the company's performance relative to industry peers and sustainability leaders across similar sectors.

Performance Level	Characteristics	Company Status
<b>Eco-Leaders (Top 10%)</b>	Comprehensive integration of sustainability across all operations, certified products, carbon neutral targets	Aspiring - On track with targeted improvements
<b>Eco-Adopters (40-70%)</b>	Active sustainability programs, systematic reporting, renewable energy adoption	Current Position - Active programs in place
<b>Eco-Laggards (Below 40%)</b>	Limited sustainability initiatives, compliance-driven approach, minimal disclosure	Not Applicable

PBA Holdings Bhd positions itself as an Eco-Adopter within the water utility sector. While it demonstrates strong operational and governance sustainability, it lags behind Eco-Leaders who typically integrate eco-innovation deeply into product design, achieve significant absolute carbon reductions, and have mature circular economy models. Compared to Eco-Laggards, PBAHB is far ahead, with robust environmental management systems, active community engagement, and a clear strategic roadmap for future water security. Its consistent compliance and proactive infrastructure development place it firmly on track to become an aspiring Eco-Leader, especially if it expands its eco-innovation scope beyond operational efficiency.

## 15. Conclusion

PBA Holdings Bhd has made commendable progress in its eco-innovation journey from 2019 to 2024, evolving into a solid Eco-Adopter. Its strengths lie in robust organizational governance, effective process optimization, and strong non-financial performance driven by community engagement and brand reputation. Key achievements include maintaining ISO certifications, implementing significant water infrastructure projects (WCP 2030), and leveraging digital platforms for customer service and water conservation. While the company faces challenges with increasing absolute CO2 emissions and limited direct product eco-innovation, its strategic focus on water security, local sourcing, and developing a net-zero framework indicates a clear path forward. To advance further, PBAHB should prioritize integrating eco-design principles into its service delivery, setting ambitious carbon reduction targets, and exploring advanced circular economy models within its operations.

### Final Assessment

**Overall Rating:** Eco-Adopter

**Key Strengths:** Robust environmental management systems (ISO 14001), Strong stakeholder engagement and community relations, Proactive water infrastructure development (WCP 2030), Effective digital customer engagement, Consistent regulatory compliance

**Priority Areas:** Product eco-innovation integration, Absolute carbon emission reduction, Advanced waste-to-resource strategies, Formal RoEI tracking for green investments, Employee eco-training and green commuting incentives

**Strategic Outlook:** PBA Holdings Bhd is strategically positioned to enhance its eco-innovation leadership by deepening its commitment to product-level sustainability and achieving absolute carbon reductions, ensuring long-term water security and environmental stewardship for Penang.