

## Small Steps Toward Green: A Case of Sustainable Practices for Efficient Energy and Water Usage in Retail Distribution Centers

### *Langkah Kecil Menuju Hijau: Kasus Praktik Keberlanjutan untuk Efisiensi Penggunaan Energi dan Air pada DC Ritel*

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#### ABSTRACT

Discourses surrounding carbon emission mitigation and ecosystem conservation often emphasize natural environmental preservation; however, integrating sustainable practices within corporate asset management is equally vital for achieving broader goals. In the retail sector—an industry characterized by extensive resource consumption—adopting environmentally responsible operations is increasingly recognized as a strategic imperative. This case study examines how a phased, strategic approach to implementing green initiatives enabled one of Indonesia's largest retail companies, PT Sumber Alfaria Trijaya, Tbk (Alfamart), to achieve notable operational efficiencies and long-term value creation, aligning with the United Nations Sustainable Development Goals (SDGs). Employing a qualitative research methodology, data were collected through semi-structured interviews with senior management and operational staff at selected Distribution Centers (DCs). Triangulation of these primary insights was obtained from secondary data sources, including internal project reports, ESG disclosures, and relevant academic and industry literature. The focus of the analysis was on the installation of solar photovoltaic panels, the implementation of water recycling and conservation systems, and adherence to green building standards within the DCs. The findings reveal that the integration of renewable energy sources, sustainable building designs, and water-efficient technologies resulted in significant reductions in energy and water consumption. The study demonstrates that what initially appeared as minor or incremental adjustments evolved into substantial improvements, fostering resilience, cost savings, and a competitive edge. Moreover, it bridges the gap between academic research and industry practice by providing practical insights into how large retail firms can integrate sustainability into their asset management strategies.

**Keywords:** Asset Management, Corporate Social Responsibility, Green Buildings, Retail, Renewable Energy.

#### ABSTRAK

Wacana seputar mitigasi emisi karbon dan konservasi ekosistem seringkali menekankan pelestarian lingkungan; namun, mengintegrasikan praktik berkelanjutan dalam manajemen aset perusahaan sama pentingnya untuk mencapai tujuan yang lebih luas. Di sektor ritel—industri yang dicirikan oleh konsumsi sumber daya yang besar—mengadopsi operasi yang bertanggung jawab terhadap lingkungan semakin diakui sebagai keharusan strategis. Studi kasus ini menyelidiki bagaimana pendekatan bertahap dan strategis dalam menerapkan inisiatif ramah lingkungan memungkinkan salah satu perusahaan ritel terbesar di Indonesia, PT Sumber Alfaria Trijaya, Tbk (Alfamart), mencapai efisiensi operasional yang signifikan dan penciptaan nilai jangka panjang, yang sejalan dengan Tujuan Pembangunan Berkelanjutan (SDGs) Perserikatan Bangsa-Bangsa. Dengan menggunakan metodologi penelitian kualitatif, data dikumpulkan melalui wawancara semi-terstruktur dengan manajemen senior dan staf operasional di Pusat Distribusi (DC) terpilih. Triangulasi wawasan utama ini diperoleh dari sumber data sekunder, termasuk laporan proyek internal, pengungkapan ESG, serta literatur akademis dan industri yang relevan. Fokus analisis adalah pada pemasangan panel surya fotovoltaik, penerapan sistem daur ulang dan konservasi air, serta kepatuhan terhadap standar bangunan hijau di dalam DC. Temuan ini menunjukkan bahwa integrasi sumber energi terbarukan, desain bangunan berkelanjutan, dan teknologi hemat air menghasilkan pengurangan konsumsi energi dan air yang signifikan. Studi ini menunjukkan bahwa apa yang awalnya tampak sebagai penyesuaian kecil atau bertahap berkembang menjadi peningkatan substansial, yang mendorong ketahanan, penghematan biaya, dan keunggulan kompetitif.

**Kata Kunci:** Manajemen aset, CSR, Green buildings, retail, energi terbarukan.

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## INTRODUCTION

After years of collaborative work between countries under the UN Department of Economic and Social Affairs, the 17 Sustainable Development Goals (SDGs) were defined as the culmination of a call to action towards sustainability in conjunction with the formalized commitment to the 2030 Agenda for Sustainable Development (UN, 2025). Aimed at improving society, the SDGs were designed as a mechanism to unite global efforts to enhance the quality of life while simultaneously conserving the environment and addressing climate change. From the industry perspective, Environmental, Social, and Governance (ESG) standards have been introduced by regulatory bodies and financial authorities as a means to streamline public disclosures to pressure corporations to adopt sustainability principles. Discourses surrounding carbon emission mitigation and ecosystem conservation often emphasize natural environmental preservation; however, integrating sustainable practices within corporate asset management is equally vital for achieving broader goals.

A global survey of over 2,000 executives in 24 countries found that 75% of corporate leaders opted to invest more in sustainability programs, indicating a high priority on climate change mitigation amongst business actors (Deloitte Global, 2023). Many industries resorted to adjusting conventional business models to adapt to new designs (Zubaedah *et al.*, 2025) or adopting circularity to attain sustainability (Zubaedah & Fontana, 2023). In the retail sector—an industry characterized by extensive resource consumption—adopting environmentally responsible operations is increasingly recognized as a strategic imperative. Lowering carbon footprint and adopting conscious marketing have been identified as pertinent for retailers to improve value offering to all stakeholders (Levy *et al.*, 2019). External pressures from the government, social organizations, and consumers have further driven corporations to adopt green retailing (Pertiwi & Hartati, 2023).

Established from the Natural Resource-Based View (Hart, 1995), competitive advantage through green business practices entails building the capabilities required to mitigate adverse effects on the environment, which includes preventing pollution, developing eco-friendly products, and aiming for sustainability (Lai *et al.*, 2010). The term product stewardship was introduced to motivate producers, designers, and users to minimize the effects on the environment throughout the product's lifecycle (NW PSC, 2025). While conventional practices tend to focus on growth and productivity, a business is considered to be “green” when it not only works for profits but also accounts for adverse effects that may be harmful to people during operations (Agarwal *et al.*, 2020). Green retailing accommodates the growing consumer awareness for sustainability, and involves organizing for eco-friendly products, brand image, and supply chain, while managing assets, energy use, and store atmosphere accordingly (Sinha *et al.*, 2014). Drawing upon the potential value of implementing sustainable practices, retailers that adopt green practices can attract more customers and improve efficiencies (Marasigan *et al.*, 2021).

Considering the growing awareness of the criticality of sustainable products and consumption, green retailing offers an alternative approach for increasing sales (Pandya, 2020). However, transforming a retail business to accommodate sustainability practices poses many challenges due to the abundance of resources necessary for ensuring responsiveness to the market. Such an endeavor compels management commitment to re-engineer the business processes, from redesigning to repackaging products, to establish a green brand (Vinish & Maruti, 2015). Implementation of sustainability programs, such as recycling, green labeling, eco-friendly retail stores, energy management, and ethically sound promotions and rewards, determines the retailer's contribution to promoting eco-friendly living (Vinish & Maruti, 2015). Consequently, the complexities of adopting sustainable practices for large retail corporations impede more companies from transitioning to green retailing.

This case study examines how a phased, strategic approach to implementing green initiatives enabled one of Indonesia's largest retail companies, PT Sumber Alfaria Trijaya, Tbk (Alfamart), to

achieve notable operational efficiencies and long-term value creation, aligning with the United Nations Sustainable Development Goals (SDGs). As a follow-up to a previous article by Tanuraharjo *et al.* (2024), this article provides a more technically detailed discussion of Alfamart's implementation of ESG programs. Specifically, through a single case study, the objective of this article is to demonstrate how a phased, strategic approach to green initiatives creates long-term value for one of Indonesia's largest retailers. Considering the distinct contexts between one retail corporation and another, the single case approach provides sufficient depth to shed light on the effective mode of adaptation for competitiveness and sustainability.

*Table 1. Summary ESG Performance (2019–2023)*

Operational	People Development	Financial
Market expansion: 14,310 stores (2019) → 19,087 stores (2023) (~7% annual growth). Energy use rose with expansion (approximately 14.46% over 5 years); energy-saving programs mitigated this growth (11.38% 2021–2022; 11.94% 2022–2023). DC water-use efficiency improved by about 12%.	Training and development programs carried out by the Human Capital Division to ensure consistent services. Increased recruitment and placement of disabled employees at an average rate of 34% over the last 5 years (Alfability Program). Empowering the micro business actors who operate stalls around Alfamart outlets, demonstrated by the average 61% rate of increase in the number of people facilitated by Aksesmu through OBA.	Net revenue rose 10% and assets 9% on average, with ROA up 23% and EBITDA up 16%, reflecting stronger equity value and earnings. The significant increase in investment costs related to environmental conservation showed Alfamart's fundamental commitment to sustainable development.

*Summarized from a previous study by Tanuraharjo et al. (2024).*

Ranked 206th out of the 250 Top Global Retailers (Deloitte Global, 2023b), Alfamart operates 23,277 retail stores and 359 stock points throughout Indonesia, with over 65% of the retail stores located on Java (AMRT, 2024). In 2024, Alfamart reported a 10.6% increase in revenue and a 13.33% rise in asset value compared to 2023, demonstrating strong competitiveness in the market. In fact, Alfamart has stated explicitly in the 2024 Annual Report (AMRT, 2024) that ESG is central to its operations and strategy, and implemented programs were designed to not only optimize contributions to SDGs but also promote growth and competitive advantage.

As presented in Table 1, a careful look at ESG performance for Alfamart showed increasing performance in operational, people development, and financial aspects. Operationally, Alfamart experienced consistent growth while simultaneously implementing energy and water-use efficiency projects at the Distribution Centers (DCs). The people development efforts were directed towards developing Alfamart's human resources, inclusive recruitment and placements of people with disabilities, and nurturing the micro entrepreneurs operating around the retail stores. In turn, Alfamart's financial performance improved while maintaining a consistent increase in investments toward environmental conservation projects. Leveraging the findings of this previous study, more detailed data were collected to elaborate on the realization of three main projects carried out at the DCs, namely, the installation of solar photovoltaic panels, the application of green building designs, and water recycling systems.

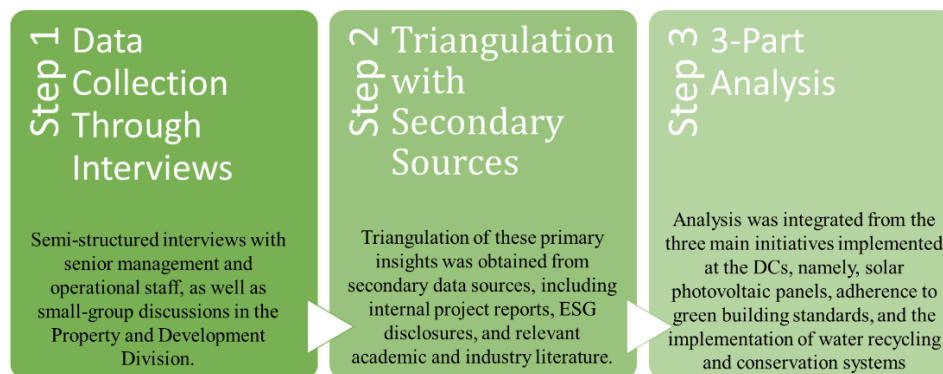
## METHODOLOGY

A complete depiction of the research design adopted for this study is presented in **Figure 1**. In addition, a brief description of the key informants and discussion dates is presented in **Table 2**. Detailed explanations of the research design and methodology are presented in the following sub-sections.

### Method

Employing a qualitative research methodology, data were collected through semi-structured interviews with senior management and operational staff at selected Distribution Centers (DCs).

Moreover, to ensure completeness and clarity, discussions with key personnel at the Property and Development Division were conducted. Key Persons in Charge (PIC) for the energy management, green DC development, and wastewater treatment projects were conducted during three separate occasions. During the first meeting, a workshop was conducted to discuss the results of the previous study conducted by Tanuraharjo *et al.* (2024), which then became the basis of this research. At the second meeting, the objectives of this follow-up study were discussed, which led to a list of data requested for further analysis. Subsequently, a third meeting was organized for all PICs to explain the basis of each project, progress, and future plans.



**Figure 1.** Research Design and Methodology

**Table 2.** List of Informants and Interview Dates

Managerial Positions	Function	Interview Dates (Duration)
GM Building & Maintenance	PIC for adapting green building standards for the development of new DCs.	14th October 2024 (2 hours, 30 minutes) 25th February 2025 (+2 hours) 27th May 2025 (+1 hour)
Building & Maintenance System Manager	PIC for energy management programs and gradual implementation of Solar Photovoltaic Panels at the DCs.	
DC Building & Development Manager	PIC for water recycling development projects to be installed gradually at the DCs.	

*Summarized from research notes.*

Based on NRBV, the conceptual framework employed in this study considered the facets of green retailing, then focused the analysis on the actual implemented programs at Alfamart. The NRBV emphasized competitive advantage through effective resource orchestration while considering the conservation of the natural environment. In the retail sector, NRBV is operationalized by green retailing, which entails organizing all retail business operations toward efficiency and sustainability. Recognizing the significant investments required to completely adopt green retailing, Alfamart selected a few main projects that require the most efficient investments, yet enable the Company to gain the most value. Consequently, this study focuses on the three main initiatives implemented at the DCs, which constitute a major portion of Alfamart’s supply chain management.

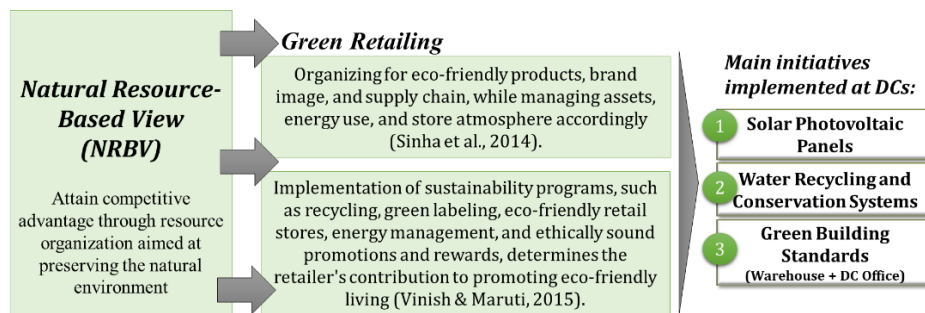


Figure 2. Conceptual Design

### Triangulation

Triangulation of these primary insights was obtained from secondary data sources, including internal project reports, ESG disclosures, and relevant academic and industry literature. Obtaining comparative data is difficult due to the uniqueness of Alfamart as the only publicly listed retail chain that discloses complete information on the financial and non-financial performance, including compliance with publishing an integrated Annual and Sustainability Reports in accordance with Financial Services Authority (OJK) regulation Number 51/POJK/03/2017 and Number 16/SEOJK.04/2021.

Table 3. Brief Summary of AMRT Sustainable Assets Management Programs

Solar Photovoltaic Panels	Water Recycling and Conservation Systems
<i>Number of PLTS Installed:</i> 34 sites	<i>Branch Office Locations:</i> 36 sites — Average Water Use/Site: 7,900 m <sup>3</sup>
Green Standard Projects	
<i>Existing Sites:</i> Serang, Semarang, Palembang, Parung	<i>New Projects (2024–2025):</i> Tegal, Gorontalo, Luwu, Bengkulu, Palangkaraya
Profile of each DC Asset	
<i>Land Area:</i> 1–3 hectares — <i>Building Area:</i> +1 hectare	<i>Service area:</i> 500–800 stores — <i>Max Energy Use:</i> 80–200 KVA
<i>Co-working space:</i> 400–1,000 m <sup>2</sup>	<i>Number of Personnel:</i> 150–200

The study analyzed the ongoing three major initiatives implemented at the DCs, namely, installation of Solar Photovoltaic panels (PLTS), water recycling and conservation systems, and adapting green standards at the warehouses and offices of the newly developed DCs. The three initiatives have been implemented since 2021, in line with Alfamart’s commitment to striving for sustainability and making effective contributions to SDGs.

### Data Analysis

Content Analysis was the main approach applied in this study, where data collected during the meetings with informants were recorded in the meeting minutes. The transcripts were then codified based on the main points related to each initiative. Through a workshop format during the first meeting, data collection was transcribed based on the discussions during the presentation of the research findings by Tanurahrarjo *et al.* (2024). During the second and third interviews, discussions were organized in sequence, from the Solar Photovoltaic Panel discussions, followed by interviews on the Water Recycling and the Green Building Standard projects with the respective informants. The general protocols for the interviews are summarized in Table 4.

**Table 4. Interview Protocols**

Main Questions for Each Project	Code		
	<i>Solar</i>	<i>Water</i>	<i>Building</i>
What was the thought process or key determinants for management to select the particular initiative?	SPP-1	WRC-1	GBS-1
What were the standards or regulations used for reference when designing the initiative?	SPP-2	WRC-2	GBS-3
How does Alfamart organize the implementation of the initiatives?	SPP-3	WRC-3	GBS-3
How are the improvements measured?	SPP-4	WRC-4	GBS-4
Considering the phased implementations, how can Alfamart confirm the gained value from the implemented green initiatives?	SPP-5	WRC-5	GBS-5

*Summarized from research notes.*

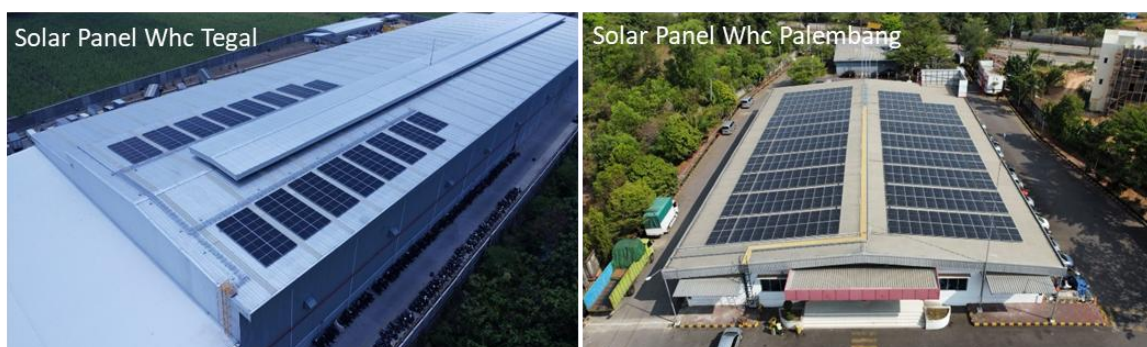
## RESULTS AND DISCUSSIONS

### Results

The focus of the analysis was on the installation of solar photovoltaic panels, the implementation of water recycling and conservation systems, and adherence to green building standards within the DCs. Discussions on the background and execution of each initiative are presented in the following sections.

#### *Solar Photovoltaic Panels*

Installation of solar photovoltaic panels was initiated in congruence with AMRT’s strategy to integrate sustainability in its business processes. Alfamart’s extensive supply chain network requires a design that allows for a good service level, managed at reasonable costs. Always striving for efficiency, Alfamart actively sought solutions and better ways to manage its DC operations to further attain cost savings. Moreover, the sustainability philosophy has been a part of Alfamart’s corporate paradigm since its initial inception, motivating the design of policy and standard procedures in accordance with creating value for all stakeholders. At the first interview, the Solar Project PIC explained, “The initiative stemmed from Alfamart’s deeply rooted business philosophy to always strive for sustainability and efficiency.” Initiating an energy management program at the DCs was the consequence of Alfamart’s commitment to proactively address environmental conservation and mitigate climate change. Alfamart turned to industry standards that include ISO50001 on Energy Management Systems and ISO50005 on Phased Implementation of Energy Management Systems.



**Figure 3.** Solar Photovoltaic Panels installed at the Tegal and Palembang Warehouses (Source: Internal Company Reports)

After careful consideration, Solar Photovoltaic Panels were selected to be the most appropriate technology in line with the Ministry of Energy and Mineral Resources Decree No. 26/2021 regarding grid-connected rooftop solar power generation for public supply. This decree regulates that the maximum capacity is equivalent to the kilowatt-hour installed, and the allowable exported value is at the discretion of the entity that holds the license. The Solar Project PIC confirmed, “Management believes that adopting solar photovoltaic panels is the most suitable renewable energy solution for SAT given the assets’ geographical location.” Subsequent to the Ministry of Energy and Mineral Resources Decree, Alfamart complies with related regulations circulated by the PLN Director in 2022, which mandates that public supply of solar power by private entities is allowed for a maximum of 15% capacity of the kilowatt-hour installed. In addition, a revision of the Ministry of Energy and Mineral Resources on solar power generation and distribution No. 02/2024, limits the quota per installation, and the value of exported power is 0% but the license holder obtains power billing deductions. In turn, Alfamart could only utilize the solar power generated for its own operations to a limited amount and was not allowed to supply power to the public. As a consequence, Alfamart can reduce its power bill and contribute to reducing carbon emissions, and make a positive contribution to mitigating climate change.

*Table 5. CO<sub>2</sub> Reductions and Energy Efficiency*

Year	Number of Facilities Installed	CO <sub>2</sub> Reduction (Tons)	Energy Efficiency	
			In MWh	In %
2021	1	80.3	80.5	–
2022	10	645.5	647.4	704%
2023	9	1,876.7	1,882.4	190%
2024	New 12, Upgrade 7	4,094	4,103.4	118%
2025	2	6,865	6,996	70%

*Source: Summarized from internal reports.*

As presented in Table 5, the solar panels were installed in stages, beginning with one facility in 2021, then gradually adding more solar panel installations at other DCs. By the end of 2024, Alfamart had installed 34 solar panel facilities at the main DCs. For illustrative purposes, energy cost savings at the Karawang branch occurred from the reduction of purchased energy from 80,377 kWh in 2020 to 59,439 kWh in 2022, or equivalent to 26% savings. Since the size of each DC operation varies from one to another, the average cost savings per facility is difficult to evaluate. Regardless, the more facilities installed, the more Alfamart gains efficiency from savings obtained with reduced power billing, and also makes greater contributions toward reducing carbon emissions. On the one hand, the significant benefits gained from energy efficiencies with the adoption of solar photovoltaic panels at the DCs are unparalleled. However, the related regulations are still unclear, which has made increasing energy capacity unfeasible. Excerpts from an internal report on the solar panel installation at the Karawang site stated:

*“During the construction period of the Karawang Branch Solar Power Plant (PLTS), ESDM Ministerial Regulation No. 26 of 2021 was still in effect, which should have allowed 100% of the excess energy absorbed by the PLN network (Feed In). However, with the Circular Letter from the Director of PLN for Java-Madura-Bali, the Karawang branch only received 65% of the excess energy absorbed by the PLN network (Feed In). With ESDM Ministerial Regulation No. 02 of 2024, after 10 years since the SJBTl was agreed upon, the excess energy absorbed by the PLN network (Feed In) of the PLTS will be 0%. This reduces the additional profit from the excess energy generated by the PLTS (±10–12 million / year).”*

	2020 (Before using PLTS)			2022 (After using PLTS)		
	PLN	PLTS		PLN	PLTS	
	Purchased Energy	Self Consumption	Feed In	Purchased Energy	Self Consumption	Feed In
January	84,056	0	0	60,562	21,077	0
February	81,328	0	0	56,224	17,268	0
March	87,520	0	0	64,218	23,332	564
April	84,520	0	0	60,868	23,600	1,282
May	68,968	0	0	59,982	21,986	1,746
June	73,824	0	0	57,858	20,115	1,104
July	79,444	0	0	59,112	23,003	1,326
August	75,772	0	0	58,254	26,521	1,370
September	79,028	0	0	57,694	24,434	1,246
October	78,988	0	0	58,624	22,858	1,710
November	85,028	0	0	61,496	21,410	828
December	86,044	0	0	58,374	20,648	1,432
Average	80,377			59,439	22,188	1,051

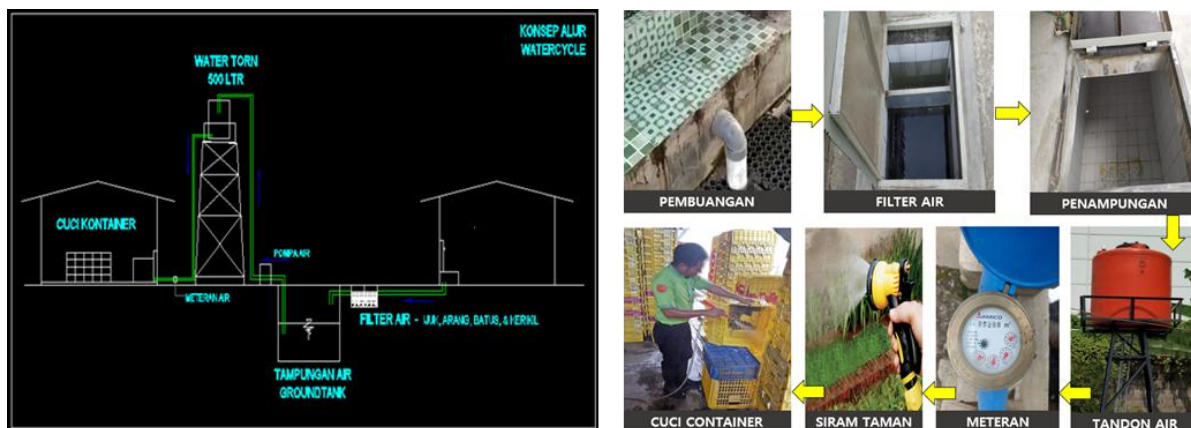
\*unit in kWh (kilo Watt hour), \*\* Case in Branch Karawang

**Figure 4.** Karawang Site as Case Discussion (Source: Internal Reports)

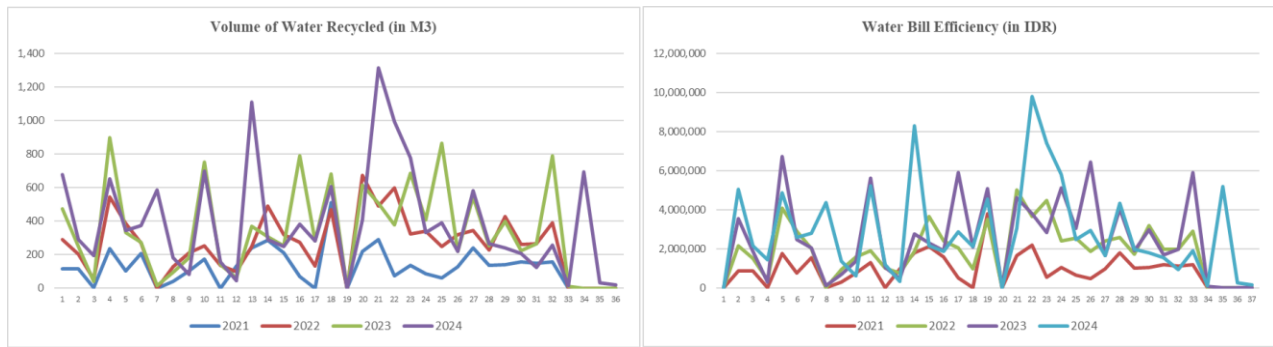
The Karawang case exemplifies a major regulatory impediment for corporations to adopt solar panels independently. Initially, deregulations of privately operated power plants were allowed, leading Alfamart to adopt this technology. As time progresses, regulatory adjustments have occurred, which have restricted expansions to larger solar panel installations. However, as expressed during the interview, Alfamart’s commitment to green retailing assured the continuation of this initiative. Although maintained at a limited scale, solar photovoltaic panels have been further installed in more locations, considering the allowable significant carbon emission reductions, as well as potential value creation for all stakeholders.

**Water Recycling and Conservation Systems**

Installation of water recycling and conservation systems further improves performance through water efficiencies. The system involves treating wastewater from the prayer rooms, then recycling it to conserve the supply. Treatment of used water (from ablution at the prayer rooms) was then directed towards the reservoirs and filtered to provide clean water for use in cleaning vehicles and equipment. Since 2021, a total of 36 installations has been completed, which resulted in an increasing amount of cost savings, from IDR33.79 million in 2021 to IDR 105.06 million in 2024, or a total of over 200% efficiency rate.



**Figure 5.** Water Recycle Systems and Sample Photos (Source: Internal Reports)



**Figure 6.** Volume of water recycled and water bill efficiencies from 2021 to 2024

In Figure 6, the charts show the volume of water recycled in cubic meters and the amount of water bill efficiencies in IDR at each branch, which showed improvements between 2021 and 2024. Total water recycled for all 36 branches amounted to 16,126 m<sup>3</sup> in 2024, representing an estimated 6.32% efficiency, which resulted from overall cost savings. However, it is important to note that installation of the water recycling system was executed gradually, and therefore difficult to appropriately compare between 2021 and 2024 figures. A closer look at individual branches, the charts showed consistent improvements at each branch.

**Table 6.** Total Water Efficiency (2021–2024)

	2021	2022	2023	2024
Total Water Recycled (m <sup>3</sup> )	4,535	9,439	14,404	16,126
Estimated Cost Savings (Rp000)	33,786	70,321	92,238	105,060
% Efficiency (Recycled water used / average water requirement)	1.92%	3.83%	4.87%	6.32%

To better demonstrate the cost savings obtained from the water treatment system, two branches in Tegal and Palembang were observed, where the more recycled water is produced, the higher the efficiencies obtained. The two branches were selected in conjunction with the green standards discussions presented in the next sub-section. Moreover, the two branches were contrasted based on the fact that Palembang was developed previously, and Tegal is one of the newer DC projects developed.

**Table 7.** Cost Savings at Two Branches

Branch	Average Water Use per Year (M <sup>3</sup> )	Water Recycled (M <sup>3</sup> )	Cost Savings	
			(In IDR)	(In %)
Tegal	7,200	696	5,185,200	9.67%
Palembang	21,036	332	2,473,400	1.58%

*\*Data provided by the Water Recycling and Conservation Systems PIC*

### Green Standard Projects

The Ministry of Public Works and Public Housing Decree No. 21/2021 defined a Green Building to be one that complies with Building Technical Standards that can consistently measure good performance in terms of efficient consumption of energy, water, and other resources. The Green Building Council Indonesia (GBCI) defined six categories under the GreenShip Certificate for new buildings, which include Appropriate Site Development (ASD), Indoor Health and Comfort (IHC), Energy Efficiency and Conservation (EEC), Water Conservation (WAC), Material Resources and Cycle (MRC), and Building Environment Management (BEM) (GBC Indonesia,

2025). Based on these standards, Alfamart determines certain areas applicable to developing new DC projects.

Applying green building standards to new DC Projects has resulted in efficiencies in the use of space and energy. Aligning with the initiatives related to energy management and water conservation, green building standards were particularly focused on space efficiency by making sure less space is needed to accommodate a greater number of people (work space/person coefficient), fewer AC and light fixtures, and overall cost savings from reduced operating costs.



**Figure 7.** Comparing Tegal and Palembang Warehouses Inventory Sizes (Source: Internal Reports)

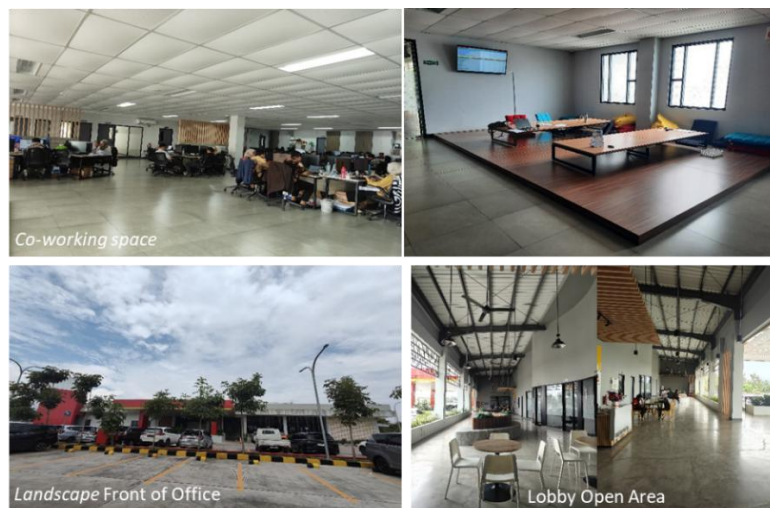
At the warehouse, the construction included the use of higher shelves and the installation of skylights to reduce the amount of energy required for lighting. Figure 7 depicts the improved inventory efficiencies with the higher racks in the newly developed warehouse Tegal compared to Palembang.

**Table 8.** Comparing Conventional and New DC

		Palembang (Old)	Tegal (New)
Land Area	m <sup>2</sup>	34,038	31,840
Building	m <sup>2</sup>	15,144	13,267
Shelves	Levels	8	10
Co-working space	m <sup>2</sup>	779	485
Common areas	m <sup>2</sup>	1,165	1,557
Number of Staff	numbers	254	181
Coefficient	workspace/person	3.07	2.68
Light Fixtures	number	317	253
AC Fixtures	number	44	51
AC Effectiveness – WH office and Support	BTU/m <sup>2</sup>	472	843
AC Effectiveness – Branch Office	BTU/m <sup>2</sup>	519	553
Average Power Bill	Rp Mio/Month	110	54

*\*Data provided by the Green Standards PIC for DC projects.*

As a result, the implementation of the green building standards covers four out of the six Greenship categories, which are ASD, EEC, and IHC. Adhering to ASD resulted in better use of space with a greater number of workers and inventory, less power use due to the reduced number of lights, and AC fixtures satisfied the EEC standards, and improved work environment with better facilities (e.g., toilet, meeting rooms, and open/common areas) were possible by adopting the IHC principles. Difficulties in monitoring overall improvements were due to the differing contexts of each DC. To demonstrate improvements gained from the green standards implemented, data comparisons between a conventional (Palembang) and a new project (Tegal) were presented in Table 8.



**Figure 8.** Sample of the Indoor Health and Comfort Standards (Source: Internal Reports)

The adoption of the Indoor Health and Comfort (IHC) Standards provided a range of improvements to the offices. As presented in Figure 8, the green building standards made the offices feel more spacious with bright natural lighting. In addition to improving the workspace per person coefficient, the design significantly reduced the number of light fixtures and increased AC effectiveness. More open spaces and common areas not only provide a healthy work environment but also enable collaborations amongst the office workers.

### **Discussions**

A deeper investigation into the three asset management projects confirms the conclusions of the previous study by Tanuraharjo *et al.* (2024). First of all, a proper governance mechanism is in place to make sure that the selected initiatives not only strive for excellence but are also underlined with sustainability principles. Selected asset management projects were prioritized based on the objective of optimal and efficient supply chain operations, while also considering limiting adverse impact to the environment. Tackling energy management, conserving water use, and the adoption of green standards at the DCs were all aimed at advancing Alfamart's core operations toward green retailing. Moreover, Alfamart's established governance allowed for the implementation of the sustainability initiatives to be integrated with the core business operations. This way, the asset management program was carried out seamlessly throughout the business operations and implemented in stages to ensure an optimal outcome.

In congruence with the properly established governance, all three initiatives were developed in compliance with the related regulations and applicable standards. Installation of the Solar Photovoltaic panels and water-use treatments were consistent with related regulations, and took advantage of the most applicable technology. The green building standards adopted were based on applicable standards for new buildings in Indonesia. Adherence to global industrial standards is essential to ensure assets are managed toward excellence. Notably, the adoption of solar panels and

green building standards not only decreased operational costs but also enhanced the company's environmental performance and reputation. Water recycling systems contributed further to resource efficiency, especially in water-intensive processes.

Due to confidentiality agreements, the economic analysis of the initiatives discussed cannot be included in this article, such as detailed analyses on investment versus benefit trade-offs, IRR, or payback periods. Consequently, there was no consent to provide more details on the implementation risks, scalability across the retail network, or the regulatory and financial barriers. Regardless, there are two main lessons learned from this study that should be generalized and extended to other retailers. First is the organization of green retailing initiatives that were made possible through good governance and management commitment to follow through. Second, appropriate information systems must be built in and integrated with business operations to ensure proper monitoring and facilitate decision-making. Although some regulatory impediments posed challenges, particularly in energy management, phased implementation appears to be the most effective approach to ensure success.

Nevertheless, continuous improvements must be pursued to ensure consistently increasing value. Considering the significant efficiencies and value from the already implemented sustainability programs, Alfamart intends to move forward and continue to replicate existing efforts related to energy management, wastewater treatment, and green building standards. Alfamart plans to expand solar panel capacity and deepen ESG integration in daily operations, including the installation of water recycling and conservation programs in more sites. Furthermore, given the good performance obtained from the adoption of green building standards, Alfamart intends to scale green building across new DC projects. Alfamart has also made additional steps to improve the monitoring and performance review of these projects through determining the appropriate measures, optimizing data recording and management information systems to provide complete and timely reports on the performance of the asset management projects.

## **CONCLUSIONS**

The findings reveal that the integration of renewable energy sources, sustainable building designs, and water-efficient technologies resulted in significant reductions in energy and water consumption. A phased, integrated approach to solar panels, green building standards, and water recycling yields measurable energy and water savings, strengthening value creation that is driven by ESG programs. Future challenges faced by Alfamart to further enhance its asset management project include upfront investment, data standardization, and regulatory clarity. Consistently integrating sustainability with strategy has allowed Alfamart to establish the corporate governance necessary to select the right initiatives and execute them accordingly. However, standardized data reporting and KPIs need to be enhanced to ensure information completeness, accuracy, and transparency with regard to measuring and monitoring ESG-driven performance. Alfamart also has to actively engage stakeholders for policy and financing support to improve implementation and elevate its position as a green retailer.

The study demonstrates that what initially appeared as minor or incremental adjustments evolved into substantial improvements, fostering resilience, cost savings, and a competitive edge. Moreover, it bridges the gap between academic research and industry practice by providing practical insights into how large retail firms can integrate sustainability into their asset management strategies. This research contributes to the growing body of literature on corporate sustainability in retail, highlighting how small, strategic green initiatives can support SDG targets, particularly those related to affordable and clean energy (SDG 7), clean water and sanitation (SDG 6), and responsible consumption and production (SDG 12). Ultimately, this case underscores that the adoption of

renewable energy and sustainable practices, even on a small scale, can serve as fundamental steps toward building a greener society and fostering environmental health globally.

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