Jurnal Samudra Ekonomi & Bisnis
Volume 16, Nomor 3, September 2025
P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Investment and Decision Analysis on Financing Models for Solar Panel Project by British American Tobacco Indonesia

Analisis Investasi dan Keputusan Model Pembiayaan Proyek Panel Surya oleh British American Tobacco Indonesia

Feri Kurniawan
Program Studi Magister Administrasi Bisnis, Institut Teknologi Bandung, Indonesia
** correspondence e-mail: 29123462@mahasiswa.itb.ac.id*

Article Info

Article History :
Received: 21 April 2025
Accepted: 19 July 2025
Published: September 2025

DOI Number :
10.33059/jseb.v16i3.11340

How to Cite :
Kurniawan, F. (2025). Investment and decision analysis of financing models for solar panel project by British American Tobacco Indonesia. *Jurnal Samudra Ekonomi dan Bisnis*, *16*(3), 721-733. DOI: 10.33059/jseb.v16i3.11340.

Abstract

The research aims to analyze the most viable financing model for British American Tobacco's (BAT) Indonesia solar panel project to meet the ESG target of 50 percent CO_2 emission reduction by 2030. Key challenges include high initial investment, low ROI, and long payback period. The research used a mixed methods approach, that is interviews and FGDs generated decision criteria, which were translated into quantitative analysis using Kepner-Tregoe Decision Analysis and Analytical Hierarchy Process (AHP). The results indicated the leasing model as the best alternative, and TOTAL Solar Indonesia as the most suitable supplier. Kepner-Tregoe Potential Problem Analysis (KT-PPA) was conducted to anticipate long-term contract risks, such as default and taxation. This research provides an optimal financing implementation strategy, best supplier selection, and risk mitigation for BAT Indonesia's renewable energy projects.

Keywords: AHP, Capital Budgeting, Decision Making, Potential Problem Analysis.

Info Artikel

Riwayat Artikel :
Diterima: 21 April 2025
Disetujui: 19 Juli 2025
Dipublikasikan: September 2025

Nomor DOI :
10.33059/jseb.v16i3.11340

Cara Mensitasi :
Kurniawan, F. (2025). Investment and decision analysis of financing models for solar panel project by British American Tobacco Indonesia. *Jurnal Samudra Ekonomi dan Bisnis*, *16*(3), 721-733. DOI: 10.33059/jseb.v16i3.11340.

Abstrak

Penelitian ini bertujuan menganalisis model pembiayaan paling layak untuk proyek panel surya British American Tobacco (BAT) Indonesia guna memenuhi target ESG pengurangan emisi CO_2 sebesar 50 persen pada 2030. Tantangan utama mencakup tingginya investasi awal, ROI rendah, dan waktu pengembalian yang lama. Penelitian menggunakan pendekatan metode campuran, yaitu wawancara dan FGD menghasilkan kriteria keputusan, yang diterjemahkan ke dalam analisis kuantitatif menggunakan Kepner-Tregoe Decision Analysis *dan* Analytical Hierarchy Process *(AHP). Hasilnya menunjukkan model sewa guna usaha sebagai alternatif terbaik, dan TOTAL Solar Indonesia sebagai pemasok paling sesuai. Analisis Masalah Potensial Kepner-Tregoe (KT-PPA) dilakukan untuk mengantisipasi risiko kontrak jangka panjang, seperti wanprestasi dan perpajakan. Penelitian ini memberikan strategi implementasi pembiayaan yang optimal, pemilihan pemasok terbaik, serta mitigasi risiko untuk proyek energi terbarukan BAT Indonesia.*

***Kata Kunci**:* AHP, Penganggaran Modal, Pengambilan Keputusan, Analisis Potensi Masalah.

2614-1523/©2025 The Authors. Published by Fakultas Ekonomi Universitas Samudra.
This is an open access article under the CC BY-SA license (https://creativecommons.org/licenses/by-sa/4.0/).

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

INTRODUCTION

A corporation develops in a world that is always changing. The modern business environment requires that corporations adjust to the social environments in which they operate. Recent advancements in environmental, social, and governance (ESG) are among the crucial aspects that corporations should addres (Chopra *et al*., 2024).

ESG is now more than just a trendy term or greenwashing tactic; it is an essential component of the modern world that businesses operate in (Todaro & Torelli, 2024). British American Tobacco (BAT), a leading international tobacco firm with 122 years of experience, must also take into account the dire repercussions of failing to meet ESG expectations in light of the precedent regarding the importance of ESG for multinational corporations. The tobacco industry, which is a part of Global Tobacco Companies, contributes almost 84 million tons of CO2 emissions worldwide, or roughly 0.2 percent of all emissions (WHO, 2022). Given the tobacco industry's substantial contribution to emissions, British American Tobacco must solve this situation.

Regarding the environment, BAT has pledged to cut its Scope 1 and Scope 2 CO2 emissions by 50 percent by 2030 compared to the baseline of 2020 (BAT, 2023). In order to meet the 2030 ESG goal of reducing 50 percent of Scope 1 and Scope 2 emissions compared to the 2020 emission baseline, Internal BAT presents a business challenge. The difference between the 2020 actual emission baseline and the Scope 1 and 2 emission gaps for BAT Indonesia to meet the ESG target by 2030 is 13,700 tCO2e. The £15.4 million needed to invest in green energy projects will help close these emission reduction gaps (BAT Indonesia, 2024).

However, because of the pressures from excise taxes and the decline in cigarette sales, BAT Indonesia cannot simply utilize all the available internal resource in the form of capital expenditures because doing so will immediately burden the cash flow. The maximum payback period is set at 10 years by BAT Indonesia's internal CAPEX deployment policy to avoid the investment burdening cash flow over an extended period of time. Furthermore, the £32.1 million in annual CAPEX available for all projects ought to be allocated not only for ESG initiatives but also for other projects such as efficiency projects, growth and expansion projects, and projects pertaining to compliance and regulations (BAT Indonesia, 2024). In order to comply with international ESG requirements and adhere to the constraints of its internal CAPEX deployment strategy, BAT Indonesia must carefully select the financing option for the green energy projects because of this perilous situation.

In addition to the financing model, the success of the project also heavily depends on the selection of a supplier or partner who will provide and manage the solar panel installation. A competent supplier must not only demonstrate strong technical quality and cost efficiency, but also be capable of ensuring long-term system performance, including maintenance and after-sales service (Aßländer *et al*., 2016; Taherdoost & Brard, 2019). Therefore, a systematic and data-driven decision-making approach is required to select the partner that best fits the company’s needs and internal conditions.

The objective of this research is to provide strategic recommendations to British American Tobacco (BAT) Indonesia in selecting the most viable and financially sound financing model for the solar panel project, as well as identifying the best-fit supplier to serve as a partner in executing the project. Furthermore, this study aims to develop a strategic implementation plan for the chosen financing model by considering various potential risks that may arise, ensuring that the project is executed effectively, efficiently, and sustainably in alignment with the company’s ESG commitments and its transition toward green energy.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

The novelty of this research lies in its integrated approach, combining qualitative and quantitative methods to analyze the financing models for BAT Indonesia's solar panel project. While previous studies have primarily focused on the financial aspects of renewable energy projects, this study expands the scope by incorporating ESG targets and the specific challenges faced by multinational corporations like BAT. Additionally, by utilizing decision analysis frameworks such as Kepner-Tregoe and Analytical Hierarchy Process (AHP), this study provides a comprehensive, data-driven decision-making model that not only identifies the most feasible financing model but also assesses potential supplier risks. This research contributes to the emerging field of sustainable finance by offering a practical framework for implementing green energy projects within the constraints of corporate financial policies.

.

LITERATURE REVIEW

A financing model is a structured approach to planning the funding of a project or business, including the sources and costs of capital and the financial instruments used, with the aim of assisting strategic decision-making in obtaining funds, managing financial risks, and optimizing the capital structure (Chukwuma-Eke *et al*., 2021). In solar PV projects, three commonly used financing models to support ESG initiatives are Power Purchase Agreements (PPAs), leasing, and green loans. PPAs allow companies to purchase electricity from a third-party provider without a large initial investment, as installation and operational costs are borne by the provider, and provide rate certainty and long-term savings (Hoogstede, 2024). Meanwhile, leasing offers the option of a fixed monthly payment for the use of solar panels, regardless of the energy produced, thus reducing the initial cost barrier (Tongsopit *et al*., 2016; Zhang, 2016). Another alternative is green loans, which are loans with favorable terms such as low interest rates and long tenors for sustainable projects.

Capital expenditures (CAPEX) financing plays a crucial role in corporate finance as it is used to acquire, upgrade, and maintain tangible assets such as property, production facilities, and equipment that form the core of a firm's operations and competitive advantage (Bae *et al*., 2021). Its funding sources can come from internal funds such as retained earnings and depreciation funds, or externally through bank loans, bonds, and equity, depending on the financial conditions, markets, and strategies of the company (Chukwuma-Eke *et al*., 2021). CAPEX decisions are often influenced by the real options framework, where investments increase when revenue expectations are positive and decrease when volatility is high (Ambrose & Steiner, 2022). Recent trends encourage the use of sustainable financing models such as green bonds and loans to support ESG projects. The effectiveness of CAPEX financing also demands risk management strategies against market, regulatory and technological uncertainties (Doshi *et al*., 2017).

Lease financing is an alternative method of acquiring assets without large initial capital requirements, allowing companies to use assets from the lessor with smaller periodic payments compared to CAPEX (Bello *et al*., 2016). This model provides flexibility and maintains cash flow, and improves the company's liquidity and financial ratios because the debt is not recorded on the balance sheet, thereby strengthening borrowing capacity and providing tax benefits through reduced taxable income. There are two types of leasing. The first is an operating lease, a short-term agreement in which ownership remains with the lessor; and the second is a finance lease, a long-term agreement in which the risks and rewards of ownership are transferred to the lessee (Obiero, 2016). In the context of a solar panel project, leasing allows the lessor to bear the entire investment and operational costs,

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

while the lessee pays the tariff for the electricity generated, with excess energy sold to PLN. All terms should be clearly spelled out in the leasing contract (Mutai *et al*., 2025).

METHOD

This study combined qualitative and quantitative methodologies in a mixed methods approach. To handle the comprehensive nature of decision-making cases in the corporate sector, where decision problems are treated from both a quantitative and qualitative perspective, a mixed methods approach is selected (Rigo *et al*., 2020). Interviewing project decision-makers and holding focus groups are part of the qualitative components. The quantitative methods will take the shape of using KT-DA to convert the qualitative dimension into quantitative analysis, together with the quantitative capital budgeting strategy found in the criterion and AHP.

The data collection techniques in this study were carried out using two types of sources, that is primary and secondary data. Primary data were obtained through semi-structured interviews with internal stakeholders, such as the CEO, Head of Engineering & Sustainability, Finance Director, and Procurement Manager, aimed at gathering in-depth insights related to decision-making criteria (Dadzie *et al*., 2018). Additionally, focus group discussions (FGDs) were conducted to formulate the MUST and WANTS criteria for selecting the appropriate financing model, as well as to establish relevant supplier selection criteria that align with the company's needs. Meanwhile, secondary data were collected from various sources, including internal company documents, sustainability reports, technical proposals from potential suppliers, and academic literature discussing financing for renewable energy projects (Elmustapha & Hoppe, 2020), in order to support the validity and comprehensiveness of the analysis.

This study was carried out in five major phases. An examination of business concerns pertaining to BAT Indonesia's ESG initiatives, particularly the solar panel project and its funding plans, kicked off the first phase. At this point, semi-structured interviews with the Head of Engineering and Sustainability, the Director of Manufacturing, and the Director of Finance were conducted in addition to a thorough literature research and an examination of internal documentation. The goal was to compile comprehensive data on BAT Indonesia's solar panel project master plan, financing obstacles and limitations, and internal policies pertaining to budget availability, CAPEX allocation, and financial parameters like WACC, discount rate, and applicable tax rates. The second stage involved a detailed capital budgeting analysis of the three financing schemes for the solar panel project — CAPEX, green bonds, and lease financing. Quantitative techniques like NPV, IRR, payback period, profitability index, and levelized cost of emission abatement were used to evaluate each plan. Following their weighting by the decision-makers, the analysis's findings were subsequently utilized as decision-making criteria in the following phase (Singh *et al*., 2022).

The third stage focused on developing decision objectives and financing scheme selection criteria based on the previous capital budgeting analysis. This phase was carried out through FGDs facilitated by the Value-Focused Thinking approach (Bortoluzzi *et al*., 2021). The expected output was a list of decision criteria structured in the format of Kepner-Tregoe Decision Analysis (KT-DA), consisting of MUSTS and WANTS criteria along with their respective attribute weights (Ardiananta & Basri, 2024). FGD participants also provided ratings for the three financing alternatives, from which the best option was selected. The fourth stage was a continuation of the decision-making process, this time focused on selecting the supplier for the solar panel project implementation. The selection criteria were developed through an additional FGD, with the results used as input for the

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Analytical Hierarchy Process (AHP) method. At the end of the session, FGD participants rated the four supplier alternatives, and the best supplier was selected based on the AHP synthesis results (Singh & Nachtnebel, 2016).

Following the selection of the supplier and finance strategy, the fifth step was devoted to creating the implementation plan. The Kepner-Tregoe Potential Problem Analysis (KT-PPA) method was used to create this strategy in order to identify potential risks and difficulties resulting from the decisions made (Ardiananta & Basri, 2024). The outcome was a structured implementation plan that includes a list of potential problems, identification of their possible causes and preventive actions, as well as contingency actions in case the issues actually occur.

RESULTS

Capital Budgeting Analysis

Table 1 shows the results of the comparative analysis between CAPEX and lease financing schemes based on five indicators, that is NPV, IRR, payback period (PP), profitability index (PI), and levelized cost of carbon abatement (LCCA). The Lease model generated a higher NPV (IDR1.36 billion) than CAPEX (IDR775 million), indicating greater long-term added value. However, CAPEX excels at IRR (7.58 percent vs 6.16 percent) and has a PI of 1.07 (feasible), while Lease is only 0.95. CAPEX takes 10 years and 1.05 months to payback, while Lease has no payback period as there is no direct initial investment. In terms of sustainability, the cost of reducing CO_2 emissions is more efficient in CAPEX (IDR1.23 million/tCO_2e) than Lease (IDR1.55 million/tCO_2e). Although CAPEX is more efficient, Lease is chosen due to its financing flexibility and lower CAPEX pressure.

Business Solution for Choosing a Project Financing Model

Establishing the KT-DA MUSTS and WANTS criteria through FGD is the first step in the business solution to choose the solar panel project finance model. The Head of Engineering and Sustainability, the Director of Finance, the Director of Manufacturing, and the Procurement Manager participated in this FGD in accordance with the agenda. The Green Bonds model is immediately disqualified for not meeting the necessary criteria based on the scoring profiles of all stakeholders in Tables 2, 3, and 4. The Lease model was superior in the most important areas, but the CAPEX model did better on metrics like NPV, PP, and Operational Simplicity (OS) that had lower stakeholder weightings. Consequently, the Lease model is concluded to be the most appropriate financing option for the solar panel project, as it best satisfies the overall decision criteria prioritized by all stakeholders. This finding is particularly relevant for BAT Indonesia, given its early stage in adopting green energy initiatives. Therefore, lease financing validated through the KT-DA process is the recommended business solution for BAT Indonesia's solar panel project.

Table 1. Capital Budgeting Data Analysis Summary

Analysis	CAPEX Model	Lease Model
NPV	775,438,315.37	1,365,966,324.24
IRR	7.58 percent	6.16 percent
PP	10 Years & 1.05 months	NA
PI	1.07	0.95
LCCA	1,230,406.55 IDR/tCO2e	1,558,441.56 IDR/tCO2e

Source: Primary data (processed), 2025.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Table 2. CAPEX Model KT-DA Scoring

MUSTS					Go/No Go
Adhere to the finance plan authorized by the BAT group.					Go
Both significant companies have chosen the financing strategy.					Go
Business professionals have been aware of the financing strategy for at least a decade.					Go
WANTS	MD	FD	HES	PM	Average Score
	Weighted Score	Weighted Score	Weighted Score	Weighted Score	
NPV is Positive	46.25	27.75	27.75	37	35
Desirable Payback Period	24	24	16	16	20
IRR Meet Shareholder's Expectation	44	38.5	44	44	43
High Profitability	17.5	17.5	17.5	21	18
Carbon Emission Cost Effective	31.5	31.5	36	31.5	33
Simple Operationality	18	24	12	18	18
Financial statement reporting compatibility	58.5	65	58.5	58.5	60
Procurement invoicing compatibility	31.5	31.5	31.5	35	32
Aligned contractual framework	40.5	40.5	40.5	40.5	41
Treasury Ease of process	31.5	31.5	28	28	30
Total			329		

Source: Primary data (processed), 2025.

Table 3. Lease Model KT-DA Scoring

MUSTS					Go/No Go
Adhere to the finance plan authorized by the BAT group.					Go
Both significant companies have chosen the financing strategy.					Go
Business professionals have been aware of the financing strategy for at least a decade.					Go
WANTS	MD	FD	HES	PM	Average Score
	Weighted Score	Weighted Score	Weighted Score	Weighted Score	
NPV is Positive	83.25	92.5	83.25	83.25	86
Desirable Payback Period	64	64	64	64	64
IRR Meet Shareholder's Expectation	22	16.5	22	22	21
High Profitability	10.5	10.5	10.5	10.5	11
Carbon Emission Cost Effective	22.5	22.5	22.5	22.5	23
Simple Operationality	48	48	54	48	50
Financial statement reporting compatibility	45.5	39	45.5	39	42
Procurement invoicing compatibility	17.5	17.5	21	10.5	17
Aligned contractual framework	31.5	36	31.5	27	32
Treasury Ease of process	17.5	17.5	17.5	14	17
Total			360		

Source: Primary data (processed), 2025.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Table 4. Green Bonds Model KT-DA Scoring

MUSTS					Go/No Go
Adhere to the finance plan authorized by the BAT group.					No Go
Both significant companies have chosen the financing strategy.					No Go
Business professionals have been aware of the financing strategy for at least a decade.					Go
WANTS	MD	FD	HES	PM	Average Score
	Weighted Score	Weighted Score	Weighted Score	Weighted Score	
NPV is Positive	-	-	-	-	-
Desirable Payback Period	-	-	-	-	-
IRR Meet Shareholder's Expectation	-	-	-	-	-
High Profitability	-	-	-	-	-
Carbon Emission Cost Effective	-	-	-	-	-
Simple Operationality	-	-	-	-	-
Financial statement reporting compatibility	-	-	-	-	-
Procurement invoicing compatibility	-	-	-	-	-
Aligned contractual framework	-	-	-	-	-
Treasury Ease of process	-	-	-	-	-
Total			0		

Source: Primary data (processed), 2025.

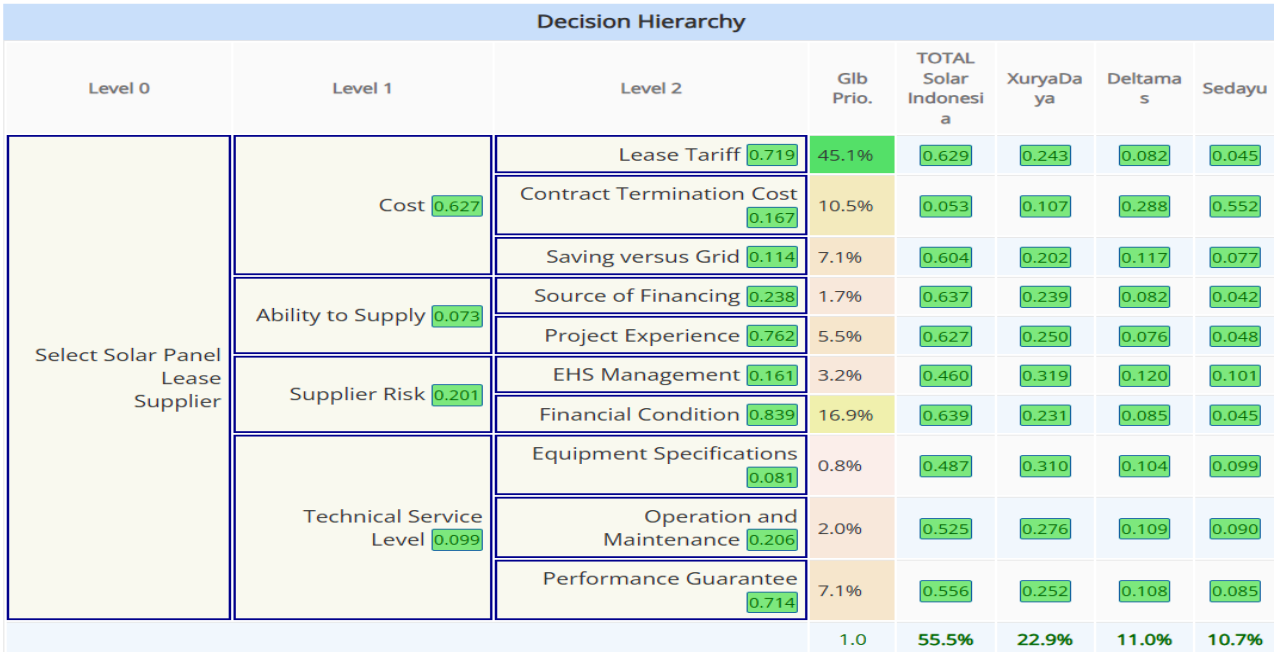


Figure 1. Simulation Results of AHP-OS Alternative Selection
Source: Primary data (processed), 2025.

Business Solution for Lease Financing Supplier Selection

Cost has the highest score in the priority ranking of criteria, at 62.7 percent, based on the weights of all alternatives and criteria in Figure 1. This is because, from a business-at-risk (BAT) perspective, it is crucial to provide a clear and certain business value because the leasing contract, which BAT

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

cannot default on, is 20 years long. With a weight of 20.1 persent, supplier risk is the second most important criterion for ensuring a 20-year contract's assurance of commitment. Due to TOTAL Solar Indonesia performs very well in terms of the most weighted factors of cost, supplier risk, and technical service level, it is therefore the ideal option for BAT Indonesia to deliver the Solar Panel Leasing project. Even though it didn't do as well as others in terms of contract termination costs, the risk will be manageable under the Kepner-Tregoe PPA.

Implementation Plan & Justification

According to Table 5's Kepner-Tregoe Potential Problem Analysis for Lease Financing Model, the implementation plan will be thorough since it takes into account multifaceted concerns regarding the kind of contract that BAT Indonesia enters into for the first time. The implementation plan for the solar panel lease financing at BAT Indonesia is designed based on a potential problem analysis to ensure a smooth execution over an estimated three-month period. Key actions focus on technical installation aspects and lease contract negotiations, especially given the 20 to 25 years duration of the agreement. The plan involves coordinated efforts among engineering, procurement, and finance departments. The Head of Engineering & Sustainability is responsible for ensuring the project's technical viability through a two-week assessment of building structure and disaster risks, funded by the lessor. Once technical feasibility is confirmed, the Finance Director must review the financial treatment of the lease, particularly regarding liabilities and tax implications, to avoid adverse impacts on the company's financial statements. Finally, the Procurement Manager leads contract negotiations, emphasizing clear clauses on potential risks such as default, termination, and insurance, guided by Kepner-Tregoe's Potential Problem Analysis framework.

Discusssion

The Most Suitable Model for Solar Panel Project Financing

The most appropriate financing model for a solar panel project largely depends on a company's internal conditions and its strategic objectives. In the case of British American Tobacco Indonesia, limited capital expenditure (CAPEX) poses a major constraint in adopting conventional direct investment models. Therefore, alternative financing approaches such as lease financing are considered more flexible and better suited to a company that is newly adopting green initiatives (Song & Poh, 2017). Lease financing allows the company to utilize solar panel systems without owning the assets directly, thereby minimizing the impact on the company's balance sheet (Klein *et al*., 2021).

Theoretically, this decision aligns with capital budgeting principles that emphasize evaluation based on financial indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (Panigrahi, 2022). In this study, lease financing yields the highest NPV and the shortest payback period compared to other financing options such as CAPEX and Green Bonds. This is supported by, who argue that financing models with high IRR and low risk are more suitable for innovative projects that lack an established internal funding pattern (Chukwuma-Eke *et al*., 2021; Klein *et al*., 2021). The lease model also offers managerial and strategic advantages. Through this model, the company can transfer most operational and technical risks to a third party (the lessor), including maintenance and solar panel performance (Hong *et al*., 2018). In the long run, this ensures stable energy system performance without requiring the company to develop new competencies that would demand significant time and cost (Lam & Yu, 2016). Thus, the company can focus on strengthening its ESG strategy without being burdened by complex technical challenges.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Table 5. KT-PPA for Implementation Plan

Lease Financing Model PPA			
Problem	Possible Cause	Preventive Action	Contingent Plan
Lessee Default and Penalty for Termination	Future uncertainty is created by the contract's excessive 20-year duration.	A contract that can be extended every five years should be negotiated. Negotiate a yearly reassessment of the termination charge using real-time asset valuation in place of fixed costs	In the contract, allow for the transfer of lease ownership to other BAT affiliate facilities.
Treasury complexity through the lessee's quarterly £24,000 bank guarantee with a 3 percent bank fee	Problems with lessor trust and the requirement for extra assurance in the event of late payment by Lessee.	To lessen the frequency of treasury complication, suggest an annual bank guarantee. After five years, suggest doing away with the bank guarantee because the lessor has demonstrated its ability to make payments and mutual confidence has been established.	To lower the bank guarantee sum deposited to the bank, amend the bank guarantee clause.
In comparison to the promised performance guarantee, solar panels perform poorly	Lessor's inaccurate estimation.	Recalibrate the Lessee-Lessor meeting committee and conduct a quarterly performance audit	Create a clause in the contract for underperformance of the solar PV system.
	The lessor's improper implementation of system maintenance	Make an audit of the maintenance plan.	If the maintenance was defective, the lessor should be charged.
As the new owner of the assets leased to the lessee, the lessor sells the lease agreement to another organization	The lessor wishes to sell the contract transaction in order to obtain a quicker return.	Apply the terms for the transfer of lessor ownership by calculating the negotiation costs and associated costs that would prevent the lessor from opting out of the contract.	Provide a lease term for the transfer of lessor ownership in order to use the lessee's influence to get the new lessor approved.
Uncontrollable events like earthquakes and volcanic eruptions that cause the system to collapse	Unpredictable circumstances.	Verify the strength and structural integrity of the structure and roof at the specified cost by Lessor. Before agreeing, have a consultant conduct a disaster assessment.	The contract should state that the lessor has insured the system and the lessor has insured the building.
Effect on the Debt Covenant	Changes in lease accounting that impact the balance sheet.	Gain insight into how leasing obligations will appear on the balance sheet by working with an accounting management consulting business.	alignment with the lessor to allow for the recording of the assets' financial statements under the terms of the lease.
Effect on the Debt Covenant	The asset is owned by the lessor instead of Lessee.	Employ tax consulting professionals to mediate the leasing agreement's tax deduction method for assets.	Talk to the lessor about lowering the lease tariff payments in order to pass on the tax credit or advantage.

Source: Primary data (processed), 2025.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

The Best Supplier to Partner with for the Solar Panel Project

Selecting the best supplier is a crucial element in the successful implementation of a solar panel project, especially given its long-term and highly technical nature. In this study, four supplier candidates were systematically evaluated using the Analytical Hierarchy Process (AHP) method, based on four key criteria: cost, supplier risk, technical quality, and project experience (Singh & Nachtnebel, 2016). The evaluation results show that TOTAL Solar Indonesia scored the highest overall, making it the most ideal partner for BAT Indonesia. The company offers a strong combination of cost efficiency and technical credibility — two of the most important indicators in sustainable technology procurement decisions.

TOTAL Solar Indonesia stands out in terms of transparent pricing, clear performance guarantees, and a proven track record of relevant past projects (Sovacool, 2018). These strengths are vital, as many renewable energy projects in Indonesia face post-implementation challenges due to suppliers' limited technical capabilities. A study by Napiza (2023) and Chowdhury & Mourshed (2016) underscores the importance of experience and post-installation service quality in selecting partners for renewable energy projects. TOTAL Solar Indonesia also excels in providing a regular maintenance system that has been shown to improve energy efficiency and reduce operational downtime.

Strategic Implementation Plan for the Selected Financing Scheme and Mitigation of Potential Risks

The strategic implementation of the lease financing scheme requires thorough planning, as leasing contracts are long-term in nature and involve sustained financial commitments (Adenuga *et al*., 2021). In the context of BAT Indonesia's solar panel project, the implementation plan is designed with consideration of key risks such as contract default, changes in fiscal regulations, and technical disruptions to system performance. The initial step involves drafting a detailed contract, including clauses for termination, contract extension, and performance guarantees from the lessor. With a clear contractual structure that prioritizes the company's interests, financial and operational risks can be managed from the outset of the project.

Based on the analysis, several preventive measures are recommended, including the provision of a bank guarantee to protect the lessee's rights, strict monitoring of solar panel technical performance targets, and insurance coverage against force majeure events such as natural disasters. Studies by Angelakoglou *et al*. (2020) and Li *et al*. (2020) emphasize that long-term projects should be accompanied by performance-based monitoring mechanisms, using legally binding Key Performance Indicators (KPI) and Service Level Agreements (SLA). In BAT Indonesia's case, this is particularly relevant as the company lacks extensive experience in managing renewable energy projects.

From the perspective of project risk management theory according to PMBOK (Project Management Body of Knowledge), effective implementation requires a combination of proactive risk planning and early stakeholder engagement. Each risk must be assessed based on its likelihood and impact, then prioritized for mitigation with appropriate strategies (Adegboyega *et al*., 2024; Rocha *et al*., 2024). For this project, the researcher recommends establishing a cross-functional task force (finance, legal, engineering) to oversee all phases of implementation. Such interdepartmental coordination will enhance the company's internal capacity to anticipate challenges and develop timely and accurate responses when risks arise.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

CONCLUSION

The conclusion of this study is that lease financing is the most feasible financing model for BAT Indonesia's solar panel project, as it meets financial and operational viability without burdening the company's internal CAPEX. TOTAL Solar Indonesia was selected as the most suitable supplier partner based on the results of the AHP analysis. Project implementation must be accompanied by risk mitigation strategies based on KT-PPA results to ensure long-term sustainability. This study offers practical contributions for corporations in making strategic decisions regarding green project financing.

Managerial recommendations include a deeper understanding of the consequences of long-term contracts, attention to accounting and fiscal impacts, and comprehensive management of the technical aspects of the project. Limitations of this study include the limited use of decision-making methods, reliance on cost and performance estimation assumptions, and perspectives derived solely from internal decision-makers. Future research is recommended to use alternative approaches, expand stakeholder coverage, and integrate external variables to strengthen the analysis and policy applicability.

REFERENCES

Adenuga, A. H., Jack, C., & McCarry, R. (2021). The case for long-term land leasing: A review of the empirical literature. *Land*, *10*(3), 238. https://doi.org/10.3390/land10030238.

Adegboyega, A. W., Ani, E. C., Oladunni, S. O., & Pramanik, A. S. (2024). Project management tools in renewable energy integration: A review of U.S. perspectives. *Engineering Science & Technology Journal*, *5*(7), 2364–2378. https://doi.org/10.51594/estj.v5i7.1359.

Ambrose, B. W., & Steiner, E. (2022). Economic fundamentals, capital expenditures and asset dispositions. *The Journal of Real Estate Finance and Economics*, *64*(3), 361–378. https://doi.org/10.1007/s11146-019-09698-9.

Angelakoglou, K., Kourtzanidis, K., Giourka, P., Apostolopoulos, V., Nikolopoulos, N., & Kantorovitch, J. (2020). From a comprehensive pool to a project-specific list of key performance indicators for monitoring the positive energy transition of smart cities — An experience-based approach. *Smart Cities*, *3*(3), 705–735. https://doi.org/10.3390/ smartcities3030036.

Ardiananta, I., & Basri, M. H. (2024). Inventory management improvement at PT Inalum, Kuala Tanjung, Sumatra Utara. *European Journal of Business and Management Research*, *9*(2), 71–78. https://doi.org/10.24018/ejbmr.2024.9.2.2302.

Aßländer, M. S., Roloff, J., & Nayır, D. Z. (2016). Suppliers as stewards? Managing social standards in first- and second-tier suppliers. *Journal of Business Ethics*, *139*(4), 661–683. https://doi.org/10.1007/s10551-016-3148-0.

Bae, J., Biddle, G. C., & Park, C. W. (2021). Managerial learning from analyst feedback to voluntary capex guidance, investment efficiency, and firm performance. *Management Science*, *68*(1), 583–607. https://doi.org/10.1287/mnsc.2020.3896

BAT. (2023). *BAT annual & sustainability report*. https://www.bat.com/investors-and-reporting/reporting/sustainability-reporting.

BAT Indonesia. (2024). *Internal CAPEX deployment policy and ESG investment planning document*. https://www.bat.com/ar/2024/documents/BAT_Combined_Summary_2024_Reduced.pdf.

Bello, U., Sabo, H., & Alhaji, A. (2016). The impact of lease financing on financial performance of Nigerian oil and gas industry. *Research Journal of Finance and Accounting*, *7*(4), 28–34. https://core.ac.uk/download/pdf/234631267.pdf.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Bortoluzzi, M., Furlan, M., Colombo, S. G., Amaral, T. M., de Souza, C. C., dos Reis Neto, J. F., & de França, J. F. (2021). Combining value-focused thinking and promethee techniques for selecting a portfolio of distributed energy generation projects in the Brazilian electricity sector. *Sustainability*, *13*(19), 11091. https://doi.org/10.3390/su131911091.

Chopra, S. S., Senadheera, S. S., Dissanayake, P. D., Withana, P. A., Chib, R., Rhee, J. H., & Ok, Y. S. (2024). Navigating the challenges of environmental, social, and governance (ESG) reporting: The path to broader sustainable development. *Sustainability*, *16*(2), 606. https://doi.org/10.3390/su16020606.

Chowdhury, S. A., & Mourshed, M. (2016). Off-grid electrification with solar home systems: An appraisal of the quality of components. *Renewable Energy*, *97*, 585–598. https://doi.org/10.1016/j.renene.2016.06.017.

Chukwuma-Eke, E. C., Ogunsola, O. Y., & Isibor, N. J. (2021). A conceptual framework for financial optimization and budget management in large-scale energy projects. *International Journal of Multidisciplinary Research and Growth Evaluation.*, *2*(1), 823–834. https://doi.org/10.54660/.ijmrge.2021.2.1.823-834.

Dadzie, J., Runeson, G., Ding, G., & Bondinuba, F. K. (2018). Barriers to adoption of sustainable technologies for energy-efficient building upgrade — Semi-structured interviews. *Buildings*, *8*(4), 57. https://doi.org/10.3390/buildings8040057.

Doshi, H., Kumar, P., & Yerramilli, V. (2017). Uncertainty, capital investment, and risk management. *Management Science*, *64*(12), 5769–5786. https://doi.org/10.1287/mnsc.2017.2815.

Elmustapha, H., & Hoppe, T. (2020). Challenges and opportunities of business models in sustainable transitions: Evidence from solar energy niche development in Lebanon. *Energies*, *13*(3), 670. https://doi.org/10.3390/en13030670.

Hong, T., Yoo, H., Kim, J., Koo, C., Jeong, K., Lee, M., Ji, C., & Jeong, J. (2018). A model for determining the optimal lease payment in the solar lease business for residences and third-party companies – With focus on the region and on multi-family housing complexes. *Renewable and Sustainable Energy Reviews*, *82*, 824–836. https://doi.org/10.1016/j.rser.2017.09.06.

Hoogstede, T. J. A. (2024). *The role of power purchase agreements in the financing of solar parks.* https://resolver.tudelft.nl/uuid:2e736852-6d4a-4033-a1ca-1b7aa7c7f7d3.

Klein, S. J. W., Hargreaves, A., & Coffey, S. (2021). A financial benefit-cost analysis of different community solar approaches in the Northeastern US. *Solar Energy*, *213*, 225–245. https://doi.org/10.1016/j.solener.2020.11.031.

Lam, P. T. I., & Yu, J. S. (2016). Developing and managing photovoltaic facilities based on third-party ownership business models in buildings. *Facilities*, *34*(13/14), 855–872. https://doi.org/10.1108/F-04-2015-0019.

Li, J., Wang, Q., & Zhou, H. (2020). Establishment of key performance indicators for green building operations monitoring — An application to China case study. *Energies*, *13*(4), 976. https://doi.org/10.3390/en13040976.

Mutai, Kiptum, K., Abdul, F., & Kimutai, C. (2025). Impact of lease financing on the financial performance of listed firms in Kenya. *Asian Journal of Economics, Finance and Management*, *7*(1), 49–61. https://doi.org/10.56557/ajefm/2025/v7i1253.

Napiza, E. A. (2023). Assessment on the acceptability of the off-grid solar panel installation trainer board. *International Journal of Research Publications*, *124*(1), 1199–1253. https://doi.org/10.47119/ijrp1001241520234944.

Obiero, J. (2016). Effects of lease financing on the financial performance of companies listed on Nairobi Securities Exchange. *Research Project*, University of Nairobi. https://erepository.uonbi.ac.ke/handle/11295/98650.

P-ISSN 2089-1989
E-ISSN 2614-1523
Terakreditasi (SK No. 225/E/KPT/2022)

Rigo, P. D., Rediske, G., Rosa, C. B., Gastaldo, N. G., Michels, L., Junior, A. L. N., & Siluk, J. C. M. (2020). Renewable energy problems: Exploring the methods to support the decision-making process. *Sustainability*, *12*(23), 10195. https://doi.org/10.3390/su122310195.

Rocha, F., Barros, T., & Fernandes, G. (2024). Risk management in photovoltaic energy projects: A Portugal case study. *Procedia Computer Science*, *239*, 1935–1941. https://doi.org/10.1016/j.procs.2024.06.377.

Singh, R. P., & Nachtnebel, H. P. (2016). Analytical hierarchy process (AHP) application for reinforcement of hydropower strategy in Nepal. *Renewable and Sustainable Energy Reviews*, *55*, 43–58. https://doi.org/10.1016/j.rser.2015.10.138.

Singh, S., Alharthi, M., Anand, A., Shukla, A., Sharma, A., & Panchal, H. (2022). Performance evaluation and financial viability analysis of grid associated 10 MWP solar photovoltaic power plant at UP India. *Scientific Reports*, *12*(1), 22380. https://doi.org/10.1038/s41598-022-26817-4,

Song, S., & Poh, K. L. (2017). Solar PV leasing in Singapore: Enhancing return on investments with options. *IOP Conference Series: Earth and Environmental Science*, *67*(1), 012020. https://doi.org/10.1088/1755-1315/67/1/012020.

Sovacool, B. K. (2018). Success and failure in the political economy of solar electrification: Lessons from World Bank solar home system (SHS) projects in Sri Lanka and Indonesia. *Energy Policy*, *123*(12), 482–493. https://doi.org/10.1016/j.enpol.2018.09.024.

Taherdoost, H., & Brard, A. (2019). Analyzing the process of supplier selection criteria and methods. *Procedia Manufacturing*, *32*, 1024–1034. https://doi.org/10.1016/j.promfg.2019.02.317.

Todaro, D. L., & Torelli, R. (2024). From greenwashing to ESG-washing: A focus on the circular economy field. *Corporate Social Responsibility and Environmental Management*, *31*(5), 4034–4046. https://doi.org/10.1002/csr.2786.

Tongsopit, S., Moungchareon, S., Aksornkij, A., & Potisat, T. (2016). Business models and financing options for a rapid scale-up of rooftop solar power systems in Thailand. *Energy Policy*, *95*, 447–457. https://doi.org/10.1016/j.enpol.2016.01.023.

Zhang, S. (2016). Innovative business models and financing mechanisms for distributed solar PV (DSPV) deployment in China. *Energy Policy*, *95*, 458–467. https://doi.org/10.1016/j.enpol.2016.01.022.