



Green Sukuk and Indonesia's Green Economy: A Maqasid Energy Assessment

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Abstract

Indonesia's sovereign green sukuk has grown rapidly, but existing studies rarely distinguish direct clean-energy financing from adaptation-oriented green infrastructure. This study addresses that gap by examining whether the cumulative allocation portfolio supports Indonesia's energy transition and maqasid-based public benefit. Using official Green Sukuk Allocation and Impact Reports published from 2019 to 2025, the study combines document analysis with three transparent indicators: the Core Clean-Energy Ratio, the Broader Energy-Transition Ratio, and sectoral HHI. Global issuance reached USD6.60 billion and domestic issuance IDR71.77 trillion by 2024. Core clean-energy allocation was 8.93%, rising to 30.54% when sustainable transport was included; water and climate resilience accounted for 69.19%. Project reports show measurable benefits, including solar generation and reported transport emission reductions, but actual and expected impacts are not interchangeable. The findings indicate that green sukuk strongly advances *hifz al-nafs*, *hifz al-mal*, and adaptation, while its direct clean-energy contribution remains moderate. The study contributes a replicable classification and transition-intensity framework and recommends preserving adaptation finance while expanding bankable clean-energy projects and comparable impact disclosure.

Green sukuk negara Indonesia berkembang pesat, tetapi penelitian terdahulu jarang membedakan pembiayaan energi bersih secara langsung dari infrastruktur hijau yang berorientasi pada adaptasi. Penelitian ini mengisi kesenjangan tersebut dengan menilai apakah portofolio alokasi kumulatif mendukung transisi energi dan kemaslahatan berdasarkan maqasid al-shariah. Analisis dokumen menggunakan seluruh Green Sukuk Allocation and Impact Reports tahun 2019-2025 serta tiga 173ectoral173 transparan, yaitu Core Clean-Energy Ratio, Broader Energy-Transition Ratio, dan HHI 173ectoral. Hingga 2024, penerbitan global mencapai USD6,60 miliar dan penerbitan domestik Rp71,77 triliun. Alokasi energi bersih inti sebesar 8,93% dan meningkat menjadi 30,54% ketika transportasi berkelanjutan dimasukkan, sedangkan air dan ketahanan iklim mencapai 69,19%. Laporan proyek menunjukkan manfaat terukur, tetapi dampak aktual dan ekspektasian tidak boleh diperlakukan sama. Hasil penelitian menunjukkan kontribusi kuat terhadap perlindungan jiwa, kekayaan, dan adaptasi, tetapi kontribusi langsung terhadap energi bersih masih moderat. Penelitian ini menghasilkan kerangka klasifikasi dan intensitas transisi yang dapat direplikasi serta merekomendasikan perluasan proyek energi bersih yang siap dibiayai dan pelaporan dampak yang dapat dibandingkan.

A. INTRODUCTION

Financing is one of the decisive constraints in Indonesia's shift from a resource-intensive growth model toward a greener economy. Renewable generation, energy efficiency, electric mobility, resilient water systems, and climate-proof infrastructure require long investment horizons and large upfront capital. Conventional public budgets remain essential, but they cannot by themselves absorb the scale, risk, and timing of these needs. Green finance therefore matters not only as a source of funds, but also as a mechanism that directs capital toward activities with measurable environmental benefits. Recent evidence links green financing with renewable-energy dependence, technological innovation, and the broader energy transition, although the strength of this relationship depends on policy credibility and institutional quality (Bai & Lin, 2023; Chu, 2024; Hossain et al., 2024; Wang et al., 2022).

Green sukuk occupies a distinctive place in this landscape because it combines a use-of-proceeds environmental instrument with the asset-linked and ethical requirements of Islamic finance. In principle, the instrument can connect climate objectives with the prohibition of harmful activity, responsible stewardship, and the pursuit of public benefit. Its rapid diffusion has also created a practical bridge between Islamic capital markets and the international green-bond architecture formalized in Indonesia's Green Bond and Green Sukuk Framework (Republic of Indonesia, 2017). Liu and Lai (2021), however, caution that adoption of familiar green-bond standards can increase market acceptance without automatically resolving greenwashing and additionality concerns. A green label is therefore a starting point for evaluation, not proof that the financed portfolio is optimally aligned with the energy transition.

Indonesia pioneered sovereign green sukuk in 2018 and subsequently developed global, domestic retail, and domestic wholesale series. This institutional development has been widely discussed as an innovation in sustainable Islamic finance. Indonesian studies have examined its maqasid orientation, legal basis, development strategy, sustainable-financing role, environmental strategy, and investor outcomes (Alhaq et al., 2023; Endri et al., 2022; Khalilurrahman & Mubarrak, 2022; Mauliyah et al., 2023; Riaz et al., 2024; Rozman & Azmi, 2022). Comparative work also distinguishes the institutional and performance characteristics of green sukuk from conventional green bonds (Lee et al., 2025). Systematic and bibliometric reviews confirm that the literature is growing, but it remains concentrated on concepts, market development, and general sustainability claims rather than the

cumulative composition of the underlying portfolio (Alam et al., 2023; Prayogo et al., 2024).

This distinction is important for energy economics. A project can be environmentally valuable without being a direct energy-transition investment. Flood control, water storage, and disaster-risk reduction mainly strengthen adaptation, while renewable power, energy efficiency, waste-to-energy, and low-carbon transport primarily change how energy is produced or used. Both functions are necessary in a climate-vulnerable archipelago, yet they answer different policy problems and produce different impact indicators. Aggregating them under one green label can hide whether financing expands clean-energy supply, reduces demand, changes mobility, or instead protects people and assets from climate hazards.

The international literature provides a strong reason to examine this composition. Green finance can support renewable-energy transition through lower financing constraints and stronger green innovation (Bai & Lin, 2023; Sun et al., 2023), while energy policies determine whether those financial resources become investable projects (Kilinc & Proskuryakova, 2024). The link between renewable transition and green growth is also not automatic; its economic benefits depend on the quality and sequencing of institutions and investment (Hwang & Sánchez Díez, 2024). For sovereign issuers, climate-labelled instruments can mobilize capital and support just-transition policy, but effectiveness must be judged from allocation and impact rather than issue volume alone (Chavarría-Flores & Warren, 2024; Owusu-Mante et al., 2025).

Transparency is consequently central to both green-finance integrity and Islamic accountability. Evidence from green-bond markets shows that environmental-information quality affects ratings and market credibility (Yang et al., 2023). External oversight, reporting design, and disclosure discipline can restrain greenwashing, whereas broad labels without comparable outcomes may encourage symbolic compliance (Ge et al., 2025; Hunt, 2024; Liu et al., 2026; Wang & Shen, 2024). These issues have a direct Islamic-finance analogue: *amanah* requires that the issuer explain where funds go, what benefits have actually occurred, and which benefits remain expected.

The study adopts *maqasid al-shariah* as a normative theory of public benefit rather than as a numerical religious-compliance score. Its foundation is the preservation of essential human interests, especially life (*hifz al-nafs*), wealth and productive capacity (*hifz al-mal*), intellect, progeny, and faith; in the green-finance

context, these objectives are connected to environmental stewardship, balance (mizan), khalifah, avoidance of waste (israf), and prevention of harm. Green sukuk allocation is therefore interpreted through a causal policy logic: proceeds finance assets, assets provide mitigation or adaptation services, and those services protect human welfare and future generations. Musari and Hidayat (2023) connect Indonesian green sukuk with maqasid and the Sustainable Development Goals, while Rahim et al. (2024) provide a broader theoretical link between Islamic finance and green development. Maqasid-based sustainability research further requires ethical claims to be reflected in financing decisions and measurable performance (Satyakti, 2023).

Despite these advances, a specific empirical gap remains. Previous studies seldom separate core clean-energy allocation from the broader energy-transition portfolio, quantify concentration across sectors, and then assess the result through maqasid. Without this separation, a large cumulative green-sukuk total may be interpreted as equivalent to a similarly large renewable-energy commitment, even when most funding serves adaptation or water infrastructure. The gap is analytical rather than semantic: mitigation, adaptation, and green growth reinforce one another, but policy makers need to know their actual weights.

This study therefore asks three questions. First, how did Indonesia's global and domestic green-sukuk issuance develop between 2018 and 2024? Second, how was the cumulative portfolio distributed across eligible sectors, and what proportion directly or broadly supported the energy transition? Third, how does this pattern align with maqasid-based goals of protecting life, wealth, the environment, and future generations? The study's novelty lies in constructing two transparent transition-intensity ratios from audited government allocation data, combining them with a concentration measure, and interpreting the resulting portfolio rather than the green label alone.

The article aims to provide a replicable allocation diagnosis that can be used by researchers, debt managers, energy planners, and Islamic-finance stakeholders. It does not test whether green sukuk causes national emission reduction or economic growth. Instead, it evaluates the structure of committed financing and the comparability of the reported impacts. This narrower claim allows the discussion to remain faithful to what the public data can support while still yielding clear recommendations for the next generation of sovereign green sukuk.

B. RESEARCH METHODOLOGY

This research uses an embedded single-country case study with quantitative document analysis. The case is Indonesia's sovereign green sukuk program. The documentary population comprises all official Green Sukuk Allocation and Impact Reports released from 2019 through 2025. The 2025 report supplies the cumulative issuance and sector-allocation dataset for 2018-2024 and the detailed impact figures for instruments issued in 2024. Reports from 2019-2024 were used to reconcile historical issue values, terminology, and the distinction between financing and refinancing. No missing values were imputed.

The unit of analysis is twofold. The issuance dataset contains seven annual observations for global sovereign green sukuk and six annual observations for domestic retail issuance, with domestic wholesale issuance beginning in 2022. The allocation dataset contains eight eligible-sector categories. All allocation shares are calculated from the report's USD-equivalent values because the corresponding rupiah values embed exchange rates from different issuance dates. Using one common equivalent prevents a mechanically distorted sector comparison.

Domestic issuance growth is summarized by the compound annual growth rate (CAGR): the ratio of 2024 to 2019 issuance is raised to the power of one-fifth, one is subtracted, and the result is multiplied by 100. Allocation concentration is measured by the Herfindahl-Hirschman Index (HHI), calculated as the sum of squared sector shares expressed as fractions. The reciprocal of HHI gives the effective number of equally weighted categories. Each transition ratio is the allocation to its specified sectors divided by total USD-equivalent allocation and multiplied by 100. Group shares are computed from allocation amounts before the resulting percentages are rounded; they may therefore differ slightly from the sum of displayed percentages in Table 2.

The sector classification follows the function of each activity in the energy transition. Renewable energy changes the supply mix, energy efficiency reduces demand per unit of service, and the combined waste-to-energy and waste-management category covers energy recovery and waste-related emission reduction. These three categories form the Core Clean-Energy Ratio. Sustainable transport is then added to form the Broader Energy-Transition Ratio because it affects fuel demand and mobility emissions. Water and climate resilience are assigned to adaptation because their main function is to reduce vulnerability. The combined waste category cannot be separated into energy and non-energy activities in the sector totals used here. Its

inclusion therefore makes the core ratio an allocation proxy; it does not imply that every financed activity produces clean energy or displaces fossil fuels.

The maqasid interpretation uses a structured coding protocol. Each sector is assigned its dominant public-benefit function, then mapped to protection of life, protection of wealth and productive capacity, environmental preservation, intergenerational justice, or amanah through disclosure. Overlapping benefits are recorded in the narrative but are not double-counted in the allocation shares. Reliability is strengthened through three checks: sector totals are reconciled to the official cumulative total; the classification is tested under narrower and broader energy definitions; and actual, expected, and pending impact indicators are kept separate. Under the narrow definition, renewable energy plus energy efficiency equals 6.34%; adding the combined waste-to-energy and waste-management category produces 8.93%; and adding sustainable transport produces 30.54%. This sensitivity sequence shows which conclusion depends on the treatment of transport and waste, while preserving the adaptation classification.

Data validity was checked in four ways. Sector values were reconciled to the cumulative allocation total; calculated shares summed to 100%; annual global, retail, and wholesale values matched the cumulative figures reported by the Ministry of Finance; and actual impact indicators were kept separate from expected indicators. The last rule is important because adding realized and projected emission reductions would overstate performance. The accompanying workbook preserves the raw transcription, formulas, source URLs, operational definitions, and quality-control checks.

The design has clear limits. It evaluates the allocation portfolio, not the counterfactual environmental effect of projects and not the price advantage of green sukuk relative to conventional securities. The sample is also too short for causal time-series estimation. Accordingly, the analysis uses exact descriptive measures and policy interpretation instead of overstating statistical inference.

B. RESULTS AND DISCUSSION

Results

1. Issuance Growth and the Domestic Market

Indonesia issued USD6.60 billion of global sovereign green sukuk between 2018 and 2024. Annual global issuance was not monotonic: it began at USD1.25 billion,

remained at USD0.75 billion during 2019-2021, reached a peak of USD1.50 billion in 2022, and then moderated to USD1.00 billion in 2023 and USD0.60 billion in 2024. This profile shows continuity of access to the international market, but it does not indicate a stable upward trend in the annual foreign-currency volume.

Domestic development was more expansionary. Retail issuance accumulated to IDR40.60 trillion and wholesale issuance to IDR31.17 trillion, producing a combined domestic total of IDR71.77 trillion. Annual domestic issuance rose from IDR1.46 trillion in 2019 to IDR18.87 trillion in 2024, equivalent to a compound annual growth rate of 66.83%. The highest annual domestic value occurred in 2023 at IDR24.29 trillion, reflecting the combined presence of retail and wholesale instruments.

Table 1. Indonesia's Green Sukuk Issuance, 2018-2024

Year	Global (USD bn)	Retail (IDR tn)	Wholesale (IDR tn)	Domestic total (IDR tn)
2018	1.25	0.00	0.00	0.00
2019	0.75	1.46	0.00	1.46
2020	0.75	5.42	0.00	5.42
2021	0.75	5.00	0.00	5.00
2022	1.50	10.00	6.73	16.73
2023	1.00	8.80	15.49	24.29
2024	0.60	9.92	8.95	18.87

Source: Ministry of Finance, Republic of Indonesia (2025); authors' calculations.

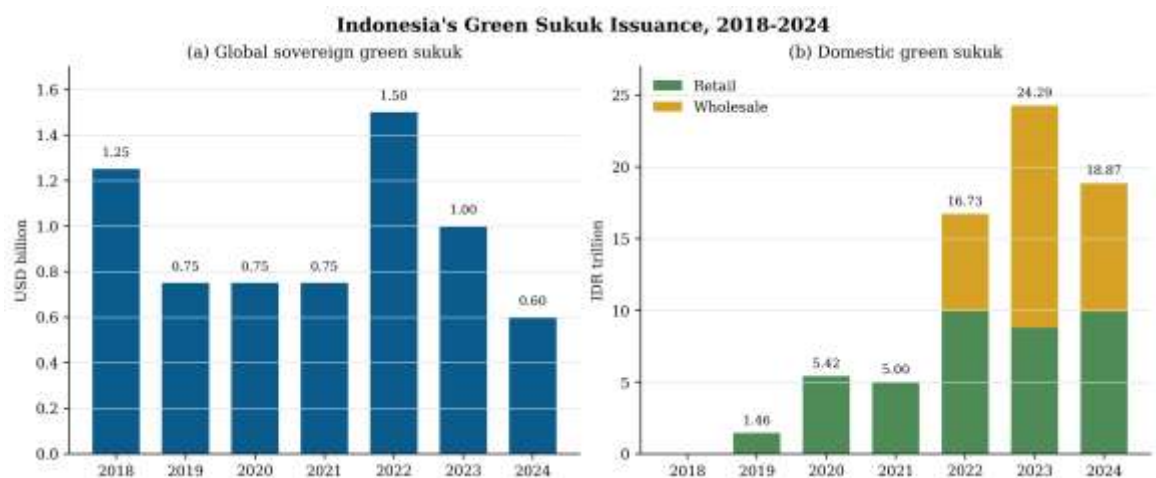


Figure 1. Global and Domestic Green Sukuk Issuance

Source: Ministry of Finance, Republic of Indonesia (2025); authors' visualization.
Global and domestic panels use different currencies and are not added together.

2. Allocation Architecture and Energy-Transition Intensity

Cumulative proceeds allocated during 2018-2024 were equivalent to USD11.53 billion across eight sectors. Sustainable water and wastewater management was the largest category at 43.24%, followed by climate resilience and disaster-risk reduction at 25.96% and sustainable transport at 21.61%. The remaining five sectors jointly accounted for less than 10%. This portfolio is therefore dominated by adaptation infrastructure and mobility rather than electricity generation or efficiency.

The concentration result reinforces this observation. The HHI equals 0.304, corresponding to an effective number of 3.29 equally weighted categories. The two largest sectors alone account for 69.19% of cumulative USD-equivalent allocation. The index is used here descriptively, not as a market-power threshold: it shows that the economic function of the portfolio is much less diversified than an eight-category label might suggest.

Table 2. Cumulative Green Sukuk Allocation by Eligible Sector, 2018-2024

Sector	USD equivalent (million)	Share	Analytical group
Sustainable Water and Wastewater Management	4986.72	43.24 %	Adaptation and resilience
Climate Resilience and Disaster Risk Reduction	2993.84	25.96 %	Adaptation and resilience
Sustainable Transport	2492.79	21.61 %	Low-carbon mobility
Renewable Energy	414.32	3.59%	Core clean energy
Energy Efficiency	317.19	2.75%	Core clean energy
Waste-to-Energy and Waste Management	297.88	2.58%	Core clean energy
Green Buildings	18.87	0.16%	Other enabling green sectors
Sustainable Natural Resources on Land	11.92	0.10%	Other enabling green sectors

Source: Ministry of Finance, Republic of Indonesia (2025); shares calculated from USD-equivalent allocation values. Total = USD11,533.52 million.

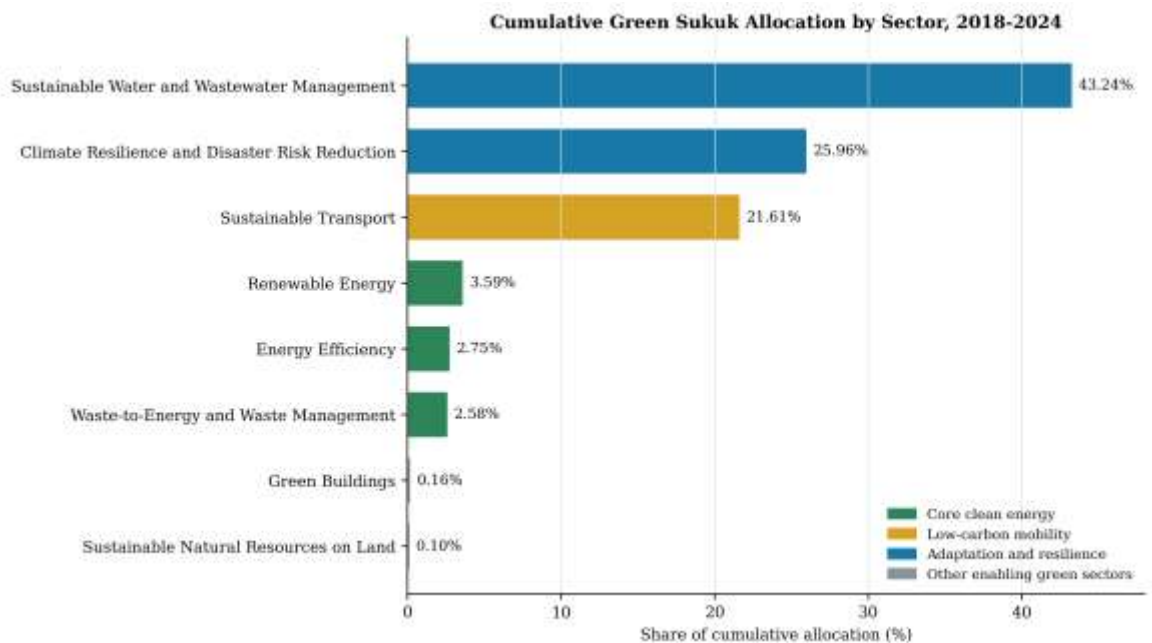


Figure 2. Sectoral Composition of Cumulative Green Sukuk Allocation

Source: Ministry of Finance, Republic of Indonesia (2025); authors' calculations and classification.

Under this classification, the Core Clean-Energy Ratio is 8.93%. Renewable energy receives 3.59%, energy efficiency 2.75%, and the combined waste-to-energy and waste-management category 2.58%. Adding sustainable transport raises the Broader Energy-Transition Ratio to 30.54%. Excluding the combined waste category leaves a narrower renewable-energy and efficiency share of 6.34%. The comparison makes the effect of the classification boundary explicit: almost one-third of allocation is assigned to energy-related sectors and mobility, while less than one-tenth falls within the core proxy. These are measures of allocation composition, not estimates of verified fossil-fuel displacement.

3. Reported Project Impacts

Reported impact examples confirm that energy-related projects are capable of measurable outcomes. For 2024 issuances, rooftop and ground-mounted solar photovoltaic projects were reported to reduce 276 tCO₂e annually and generate approximately 325 MWh of electricity. Sustainable-transport projects under ST013T4 reported 1,634,786 tCO₂e of actual annual reductions and 2,091,219 tCO₂e of expected annual reductions, while the ST012T4 airport-railway project reported 1,464 tCO₂e of actual annual reductions. These values are evidence of project-level benefit,

but they should not be summed because they differ in realization status and project scope. The figures are drawn from the 2025 allocation and impact report (Ministry of Finance, Republic of Indonesia, 2025).

The reported figures also clarify the limits of project-impact comparisons. For ST013T4, actual and expected reductions are kept separate. Interpreting their difference as an implementation gap would require matching project coverage, baselines, and operating periods, which the aggregate values alone do not establish. The solar projects report about 325 MWh of annual generation alongside 276 tCO₂e of annual reductions, illustrating the value of presenting energy output and emission indicators together. The ST012T4 result of 1,464 tCO₂e is project-specific and should not be ranked directly against the larger ST013T4 aggregate. These examples show how the reported benefits complement the allocation analysis while remaining insufficient to establish a national causal effect.

Discussion

1. Market Development and Energy-Transition Balance

The issuance pattern suggests a gradual localization of the green-sukuk funding base. Retail sukuk brings individual investors into climate finance, while the wholesale series provides larger domestic placement capacity. This diversification can improve resilience against external financing conditions and strengthen public ownership of the green agenda. It also fits the inclusive-finance potential emphasized in Indonesian green-sukuk research (Khalilurrahman & Mubarrak, 2022). Nevertheless, growth in instruments is not equivalent to growth in renewable energy. The policy meaning of the expansion ultimately depends on how the proceeds are allocated.

The finding does not mean that the dominant allocations are environmentally weak. Water infrastructure and climate resilience are critical in Indonesia, where floods, drought, food security, and disaster exposure create large social and fiscal losses. Their 69.19% combined share reflects a rational response to adaptation needs. The policy issue is balance: if green sukuk is also expected to accelerate the national energy transition, the current clean-energy pipeline is too small relative to the instrument's cumulative scale.

The composition also clarifies why finance and energy policy must be coordinated. Studies across emerging economies find that finance supports the transition when it is connected to investable technology, policy certainty, and

innovation (Sun et al., 2023; Wang et al., 2022). Indonesia's green sukuk market has demonstrated fund-raising capacity; the remaining constraint appears to be the volume of eligible, implementation-ready renewable and efficiency projects capable of absorbing proceeds with reliable impact baselines.

2. Maqasid Assessment of the Portfolio

From a maqasid perspective, the allocation pattern has a strong protective character. Water management, flood control, and disaster-risk reduction directly protect life and health, while also safeguarding agricultural production, household assets, public infrastructure, and fiscal stability. In this sense, the large adaptation share is not a diversion from Islamic objectives. It expresses the prevention of harm and the preservation of basic conditions for human welfare.

Protection of wealth is visible in both adaptation and sustainable transport. Avoided disaster losses preserve private and public capital, while rail and transit investment can improve productive connectivity and reduce fuel use. The combination supports a green economy because it protects the existing capital stock and changes the infrastructure through which future production and mobility occur. Public-investment research likewise suggests that credible green programs can influence sovereign financing conditions and convert climate risk into investment opportunity (Alessi et al., 2025).

Environmental preservation is present across all eligible categories, but the energy dimension is uneven. The principles of balance and intergenerational justice require more than financing immediate protection; they also require changing the systems that generate long-term emissions and fossil dependence. The 8.93% core clean-energy ratio is therefore best assessed as moderate rather than strong. It indicates a functioning foundation, including solar, efficiency, and waste conversion, but not yet an allocation weight commensurate with the public narrative of an accelerated energy transition.

Amanah is the fourth dimension. Indonesia publishes annual allocation and impact reports, identifies project owners, separates financing from refinancing, and obtains external assurance. These practices are important strengths. Yet comparability remains incomplete: some project categories report tCO₂e, others report water capacity, land protected, beneficiaries, or infrastructure outputs, and several estimates remain pending. Green-bond research shows why this matters. Reporting architecture is not a secondary administrative detail; it shapes information quality, credibility, and

the ability to distinguish real performance from symbolic greenness (Hunt, 2024; Yang et al., 2023).

Table 3. Maqasid-Based Interpretation of the Allocation Portfolio

Maqasid dimension	Observed allocation evidence	Assessment	Priority
Protection of life (hifz al-nafs)	Water and climate-resilience sectors jointly receive 69.19%; projects reduce flood exposure and strengthen water security.	Strong	Preserve adaptation financing and report beneficiary and risk-reduction outcomes consistently.
Protection of wealth (hifz al-mal)	Resilient infrastructure and sustainable transport protect assets, productivity, and mobility.	Strong	Connect allocation to avoided-loss and lifecycle-value indicators.
Environmental preservation	All sectors are green-eligible, but core clean energy represents 8.93% and the broader transition 30.54%.	Moderate	Build a larger pipeline for renewables, efficiency, storage, grids, and clean industrial energy.
Intergenerational justice and balance	Long-lived water, transport, and energy assets create future benefits, although allocation is concentrated.	Moderate	Balance mitigation and adaptation without weakening either function.
Amanah and disclosure	Annual reporting and assurance are established; actual, expected, and pending impacts are not yet fully comparable.	Moderate-strong	Use common baselines, realization status, and portfolio-level transition indicators.

Source: Authors' interpretation based on the audited allocation dataset; the assessment is qualitative and does not constitute a sharia ruling.

3. Relation to Previous Research

The results complement, but also qualify, earlier Indonesian research. Endri et al. (2022) show the sustainable-financing potential of corporate green sukuk, while Alhaq et al. (2023) identify strategic opportunities and constraints for national market development. The present study adds a portfolio-level result: sovereign issuance capacity is no longer the only question. Sectoral balance and the availability of a bankable clean-energy pipeline now determine whether market growth translates into faster decarbonization.

The finding also supports the maqasid argument advanced by Khalilurrahman and Mubarrak (2022) and Musari and Hidayat (2023), but with a more differentiated conclusion. Green sukuk clearly serves *maslahah* through water, resilience, transport, and environmental projects. However, maqasid should not be used only to validate the instrument at a general level. It can also be used as a decision discipline that asks whether the portfolio is balanced across present protection, structural emission reduction, inclusion, and future welfare.

International comparison places this result in a wider emerging-market context. Evidence from China and the E7 economies links green finance with renewable-energy dependence and transition outcomes, but emphasizes the mediating roles of innovation, policy certainty, and institutional quality (Sun et al., 2023; Wang et al., 2022). Research on sovereign climate bonds in developing countries similarly shows that issuance volume alone is insufficient when just transition and additionality are not demonstrated (Chavarría-Flores & Warren, 2024). Indonesia's adaptation-heavy profile is therefore plausible for a climate-vulnerable emerging economy, but it is not a reason to treat direct clean-energy allocation as equivalent to general green infrastructure. Relative to the greenwashing concerns identified in Malaysia and international green-bond markets (Liu & Lai, 2021; Ge et al., 2025; Wang & Shen, 2024), Indonesia's annual allocation and impact reporting is a strength, while the remaining challenge is to make project-level outcomes more comparable across sectors and issuances.

International research on greenwashing makes this discipline especially relevant. Ge et al. (2025) and Wang and Shen (2024) demonstrate that a labelled instrument may still produce weak environmental additionality when disclosure and external supervision are inadequate. Liu et al. (2026) similarly frame environmental disclosure as a test between signalling and greenwashing. Indonesia's reporting framework is comparatively strong, but credibility can be improved further by publishing a consistent portfolio dashboard that separates committed, disbursed, operational, verified, expected, and pending impacts.

4. Policy Implications

The first policy implication is to introduce an explicit allocation corridor for core clean energy. This article does not claim an econometrically optimal percentage. As a practical scenario, however, gradually lifting the core ratio from 8.93% toward at least 15% over successive issuance cycles would nearly double the present weight

while leaving substantial room for adaptation. The corridor should be conditional on project quality, not satisfied by relabeling broad infrastructure as energy. Eligible priorities include renewable generation, storage, smart grids, public-building efficiency, clean industrial heat, and carefully governed waste-to-energy.

The second implication is to report mitigation and adaptation as complementary sub-portfolios. The current instrument already finances both, but the distinction is not sufficiently prominent in public interpretation. A two-window dashboard would show how much funding reduces future emissions and how much reduces vulnerability to unavoidable climate impacts. This would prevent the energy-transition claim from overshadowing adaptation and prevent adaptation success from concealing a limited clean-energy pipeline.

Third, impact reporting should be decision-useful. For comparable energy projects, reports should disclose the baseline, operational date, installed capacity, annual generation or savings, verified tCO₂e, allocation amount, and emissions reduced per unit of expenditure. Expected and actual values should appear in separate columns. For adaptation projects, avoided-loss estimates, people protected, service reliability, and resilience standards can complement physical outputs. This approach responds to the reporting concerns raised by Hunt (2024) and the market benefits associated with high-quality environmental information (Yang et al., 2023).

Fourth, the Ministry of Finance and energy-sector institutions should develop a rolling, pre-screened project pipeline before issuance. Financial policy alone cannot create renewable assets if permitting, land access, grid connection, procurement, and off-take arrangements are unresolved. The evidence that green finance works through innovation and policy coordination (Bai & Lin, 2023; Hossain et al., 2024; Kilinc & Proskuryakova, 2024) implies that debt management and energy planning must share milestones and data definitions.

Finally, future design should retain the social character of Islamic finance. Retail distribution can deepen citizen participation, while blended structures with Islamic social finance may help finance smaller decentralized energy and resilience projects that do not fit conventional sovereign-project scale. Any such expansion requires clear governance and additionality. A maqasid label cannot substitute for technical appraisal; it should make the appraisal more demanding by linking financial structure, environmental integrity, and distributive benefit.

D. CONCLUSION

Indonesia's sovereign green sukuk has mobilized substantial international and domestic Islamic climate finance, but the portfolio's primary function is adaptation, water security, and resilient infrastructure. Core clean-energy sectors account for 8.93% of cumulative allocation, while the broader energy-transition measure reaches 30.54% when sustainable transport is included. This distinction answers the study's central research gap: green-labelled financing is not synonymous with direct renewable-energy financing.

The article makes two contributions. Theoretically, it uses *maqasid al-shariah* as a structured public-benefit lens that connects allocation decisions with protection of life, wealth, environmental conditions, and future generations. Methodologically, it combines a replicable sector-classification protocol and two transition-intensity indicators with the standard HHI concentration measure and a sensitivity sequence that distinguishes narrow clean energy from broader transition activity. Together, these tools make the green-sukuk debate more precise without treating *maqasid* as an arbitrary compliance score.

The policy implication is to preserve adaptation finance while enlarging the bankable pipeline for renewable energy, efficiency, storage, grids, and clean mobility. Future reports should separate committed, disbursed, operational, verified, expected, and pending impacts, and future research should test additionality and financing effects against appropriate counterfactuals.

The study remains limited by its reliance on reported allocation and project-impact data, the short issuance history, and the absence of a causal counterfactual. Cross-country comparison with other sovereign green-sukuk issuers and longitudinal project-level verification would provide the next test of whether stronger clean-energy allocation changes financing cost, investor demand, and national transition outcomes.

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