

Blended Finance and the Bankability of Renewable Energy Infrastructure in Africa: Explaining the Gap Between Capital Commitments and Financial Close

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Abstract

This study examined how blended finance influenced the bankability and financial-close outcomes of six renewable-energy infrastructure cases across Nigeria, Kenya, South Africa and Côte d’Ivoire. A comparative multiple-case design combined documentary analysis, process tracing and a ten-criterion Project Bankability Assessment Index. Evidence was drawn from 48 project, government, development-finance, institutional and peer-reviewed documents covering 2015–August 2026. The analysis distinguished capital commitment, financing approval, financial close, disbursement and operation. Menengai achieved the highest bankability score at 90.0%, followed by Redstone and Singrobo-Ahouaty at 85.0% each, Boundiali at 80.0% and the Nigeria Electrification Project at 75.0%. Nigeria’s utility-scale solar IPP programme recorded 25.0% because currency, tariff, off-taker and guarantee risks remained unresolved. Currency and off-taker weaknesses affected five cases, while construction delays affected four. The findings showed that blended finance supported financial close when instruments addressed identifiable project risks, as demonstrated by public absorption of geothermal exploration risk at Menengai and performance-based support for Nigerian mini-grids. Conversely, capital commitments and signed power-purchase agreements did not produce bankability where revenue and foreign-exchange risks remained unallocated. The study contributed a commitment-to-close framework separating financing announcements from executable investment and distinguished financial bankability from implementation performance. It concluded that Africa required stronger project preparation, local-currency finance, credible off-taker support, transparent guarantees and post-close monitoring to convert climate-finance commitments into operational infrastructure at scale and on time.

Keywords: Blended finance, Climate-resilient infrastructure, Financial close, Project bankability, Renewable energy, Risk allocation.

1. Introduction

1.1. Background to the Study

Renewable-energy infrastructure has become central to Africa’s development and climate-transition agenda. Reliable electricity supports productive activity, public services and household welfare, while renewable technologies can expand energy access and reduce dependence on carbon-intensive generation. Africa nevertheless faces a persistent gap between its renewable-energy potential and the volume of projects that reach financial close and commercial operation. This gap reflects limited capital availability as well as weaknesses in project preparation, revenue security, currency protection, institutional credibility and risk allocation.

Available finance remained far below the scale required. Africa received approximately US\$43.7 billion in annual climate finance during 2021–2022, an increase from US\$29.5 billion in 2019–2020, but this represented only about 23% of its estimated climate-financing requirement (Climate Policy Initiative [CPI], 2024). The United Nations Economic Commission for Africa estimated that the continent could face a climate-finance shortfall of about US\$2.5 trillion by 2030. Africa also attracted only about 2% of global clean-energy investment, although its clean-energy investment requirement was estimated at US\$2.8 trillion by 2030 (Reuters, 2024a). These figures showed that the financing problem involved both insufficient capital and the inability of proposed projects to convert available commitments into executable investments.

Public finance alone could not meet this requirement. African governments faced narrow fiscal space, rising debt-service obligations, volatile currencies and limited access to long-term borrowing. Commercial investors, conversely, required returns that compensated for construction, currency, off-taker, political and regulatory risks. The cost of capital for utility-scale clean-energy projects in Africa was estimated to be at least two to three times higher than in advanced economies (International Energy Agency [IEA], 2023). Ameli et al. (2021) described this condition as a climate-investment trap: high perceived risks increased financing costs, low investment weakened infrastructure and institutional capacity, and the resulting vulnerability further raised risk premiums. Technological viability therefore did not necessarily produce financial viability.

Blended finance emerged as a response to this mismatch. It combines public, concessional or philanthropic resources with commercial capital to improve a project's risk-return profile. Its instruments include concessional loans, subordinated debt, first-loss capital, viability-gap grants, guarantees, political-risk insurance, technical assistance and project-preparation funding. Properly structured concessional capital can absorb risks that commercial investors cannot price efficiently, reduce financing costs and attract investment that would otherwise remain unavailable. Geddes and Schmidt (2020) found that public financial institutions could mobilise private low-carbon investment through tailored risk-sharing instruments, although their effectiveness depended on policy stability, institutional capacity and credible project pipelines.

The presence of blended finance, however, did not make a project automatically bankable. Bankability describes the extent to which a project offers lenders and investors an acceptable combination of predictable revenue, enforceable contracts, capable sponsors, manageable risks and adequate returns. A renewable-energy project might obtain concessional funding yet remain unbankable because the power purchaser lacked creditworthiness, the tariff could not cover costs, land rights were unresolved or foreign-currency obligations were unsupported. Similarly, a climate-resilient transport project might attract donor commitments but fail to progress because feasibility studies, demand forecasts, environmental approvals or procurement arrangements were incomplete.

Financial close provided a more rigorous indicator of bankability than the announcement of funding. It occurred when lenders and sponsors had executed the principal financing agreements and satisfied, or formally provided for, the conditions required before funds could be drawn. A financing commitment represented an intention or approval to provide capital. Disbursement recorded the actual transfer of funds, while financial close confirmed that the contractual, risk-allocation and financing arrangements had become effective. Treating these stages as equivalent could exaggerate investment performance and conceal delayed or abandoned projects.

This distinction was especially relevant to Nigeria, Kenya, South Africa and Côte d'Ivoire. The countries represented large and institutionally distinct infrastructure markets in West, East and Southern Africa. Nigeria possessed substantial renewable-energy and transport needs but faced currency instability, off-taker weakness and regulatory uncertainty. Kenya had attracted private capital into geothermal, wind and road projects, although land, procurement and public-liability concerns affected some investments. South Africa had accumulated extensive experience under the Renewable Energy Independent Power Producer Procurement Programme, but grid constraints, public-utility risks and delays affected later investment rounds. Côte d'Ivoire had used development-finance partnerships and independent power-producer arrangements, while sovereign, currency and project-preparation risks remained material.

These contrasting experiences provided a useful basis for examining why comparable projects produced different financial-close outcomes. Egli (2020) demonstrated that renewable-energy investment risks changed across project stages and institutional settings. This implied that a general country-risk rating could not explain every financing outcome. Project preparation, contractual design, revenue security and the allocation of specific risks also shaped lender decisions.

Blended finance further raised questions about additionality and accountability. Public or concessional resources produced financial additionality when they mobilised commercial investment that would not have occurred under market conditions. Yet excessive risk transfer to the public sector could protect private returns without producing corresponding development value. Recent research has therefore questioned whether financialisation sometimes prioritised transactions attractive to investors over socially necessary infrastructure with weaker revenue streams (Bernards, 2024). Effective blending required disciplined use of public support, transparent allocation of contingent liabilities and evidence that concessionality addressed a defined market failure.

1.2. Research Problem and Gap

Debates on renewable-energy finance in Africa have concentrated largely on aggregate financing gaps, announced capital mobilisation and donor commitments. have concentrated largely on the aggregate financing gap, the amount of capital mobilised and the volume of donor commitments. These measures were important but did not establish whether capital reached projects, whether financing conditions were satisfied or whether infrastructure became operational. The commitment-to-close gap remained poorly measured because project information was dispersed among appraisal reports, financing agreements, government disclosures and development-finance databases.

Many projects secured public announcements, donor approval or expressions of commercial interest but remained delayed before financial close. Recurring constraints included incomplete preparation, weak off-takers, foreign-exchange exposure, tariff disputes, land acquisition, procurement delays, fragmented regulation and insufficient guarantee coverage. The existence of investible funds therefore coexisted with a shortage of investible projects. For example, Africa's domestic institutional investors reportedly held substantial financial resources, yet regulatory restrictions, liquidity requirements and project risks limited their participation in long-term infrastructure (Reuters, 2025).

Three related gaps followed. First, empirical studies often assessed climate-finance mobilisation at national, regional or fund level without tracing the transition from commitment to financial close. Second, blended-finance research frequently treated guarantees, concessional debt and technical assistance as mobilisation instruments without examining whether they addressed the specific risks preventing financial close. Third, limited comparative evidence explained why some climate-resilient infrastructure projects reached financial close while apparently similar projects remained stalled across different African institutional environments.

The study addressed these gaps through a comparative project-level analysis of Nigeria, Kenya, South Africa and Côte d'Ivoire. It linked financing stages to project preparation, institutional conditions, blended-finance instruments and risk allocation. Financial close, rather than capital announcement alone, served as the principal indicator of bankability.

1.3. Research Questions

The study answered the following questions:

1. What blended-finance instruments were applied to the selected climate-resilient infrastructure projects?
2. What differences existed among committed, approved, disbursed and financially closed capital?
3. Which project, financial and institutional constraints delayed financial close?
4. How were currency, construction, revenue, off-taker, regulatory, political and climate risks allocated among project participants?
5. Why did some projects reach financial close while comparable projects remained delayed?
6. What financing and policy arrangements could improve the bankability of climate-resilient infrastructure in Africa?

1.4. Research Objectives

The study sought to:

1. identify the blended-finance instruments used in the selected projects;
2. compare capital commitments, approvals and disbursements with financial-close outcomes;
3. assess the allocation of major risks among governments, sponsors, lenders, development-finance institutions and off-takers;
4. determine the principal constraints affecting project bankability;
5. explain differences between financially closed and delayed projects; and
6. develop a framework for moving climate-infrastructure projects from financing commitment to financial close.

1.5. Scope of the Study

The study covered six renewable-energy projects and programmes in Nigeria, Kenya, South Africa and Côte d'Ivoire between 2015 and August 2026. The cases included solar mini-grids, utility-scale solar photovoltaic projects, geothermal generation, concentrated solar power and hydropower. They were selected purposively based on their renewable-energy relevance, use of public, concessional or development finance, availability of project-level documentation and variation in financial-close and implementation outcomes. The analysis concentrated on project preparation, financing structure, risk allocation, institutional conditions and implementation status. It did not assess engineering performance, physical climate resilience or the continent's total renewable-energy financing requirement.

1.6. Significance of the Study

The study shifted the analytical focus from the quantity of announced climate finance to the quality and executability of financed projects. Its commitment-to-close approach provided governments and project sponsors with a practical basis for identifying where projects stalled. Development-finance institutions could use the findings to match concessional instruments with clearly defined risks, while commercial investors could assess whether public support produced credible revenue and risk protections.

The study also contributed a project-bankability framework for comparing infrastructure transactions across different regulatory settings. By separating commitment, approval, disbursement and financial close, it reduced the risk of overstating climate-investment progress. Its findings were therefore relevant to climate-finance policy, PPP design, investment appraisal and the development of credible infrastructure pipelines in Africa.

2. Literature Review

2.1. Conceptual Review

2.1.1. Climate-Resilient Infrastructure

Climate-resilient infrastructure comprises physical assets and systems designed, constructed and operated to withstand present and projected climate hazards while sustaining essential services. It includes renewable-energy systems, climate-adapted transport networks, resilient power grids, flood-control facilities and infrastructure retrofits. Resilience therefore extends beyond reducing greenhouse-gas emissions. A solar plant may support mitigation but remain physically vulnerable to flooding, heat or water stress. Similarly, an urban road may be low-carbon yet fail to provide reliable access during extreme rainfall.

African infrastructure requires this combined mitigation-resilience perspective because climate hazards interact with existing service deficits, weak maintenance and rapid urbanisation. The Intergovernmental Panel on Climate Change identified Africa as highly exposed to heat, drought, flooding, water insecurity and infrastructure disruption, with limited fiscal and institutional capacity restricting adaptation (IPCC, 2022). Climate resilience should consequently be integrated into engineering design, financial appraisal, procurement and lifecycle maintenance rather than added after project approval.

Resilient design can increase initial capital expenditure, while many of its benefits appear as avoided future losses rather than immediate cash income. Private investors may therefore undervalue resilience where tariffs, tolls or availability payments do not compensate for additional costs. This creates a financing problem: the project may generate substantial economic and social benefits but insufficient commercial returns. Public or concessional finance becomes relevant where it converts wider resilience benefits into a financeable project structure.

2.1.2. Blended Finance

Blended finance refers to the strategic use of public, development or philanthropic resources to mobilise additional commercial capital for projects with development or climate objectives. It does not simply mean that a transaction has multiple financiers. The defining feature is that public or concessional participation modifies the allocation of risk, cost or return sufficiently to attract investors who would not otherwise participate on comparable terms.

Common instruments include concessional loans, subordinated debt, first-loss capital, grants, guarantees, political-risk insurance, local-currency facilities and technical assistance. Concessional debt reduces interest costs

or extends maturity. Subordinated capital absorbs losses before senior commercial lenders. Guarantees transfer defined political, credit or contractual risks to governments or development institutions. Project-preparation grants finance feasibility studies, environmental assessments, transaction advisers and legal documentation.

Blending can address genuine market failures, but its value depends on additionality. Financial additionality arises when public support mobilises investment that would not have occurred on market terms. Development additionality occurs when the financed project generates benefits exceeding those of the available commercial alternative. If concessional capital merely increases private returns on an already bankable project, it may produce little additionality and create unnecessary public exposure.

The Organisation for Economic Co-operation and Development (OECD, 2025) observed that private mobilisation remained far below the investment required in emerging and developing economies. This suggested that blended finance should be evaluated by the quality, timing and sustainability of mobilised investment rather than headline mobilisation ratios alone. Bernards (2024) similarly cautioned that private-finance mobilisation can narrow development priorities toward revenue-generating projects while excluding socially necessary infrastructure with weak or indirect cash flows.

2.1.3. Capital Commitment, Approval, Disbursement and Financial Close

Capital commitment, financing approval, disbursement and financial close represent distinct stages of project finance. A commitment expresses an intention to provide funds, sometimes subject to due diligence, board approval or conditions precedent. Approval indicates that the relevant financier has formally authorised the transaction. Disbursement occurs when approved funds are transferred. Financial close occurs when the principal financing contracts have been executed and the material conditions required for drawing funds have been satisfied or validly waived.

This distinction matters because announced finance may remain unavailable for several years. A project can receive donor approval without completing land acquisition, procurement, guarantees or environmental conditions. It can also reach initial close with one financier while leaving a material financing gap. Therefore, capital commitment overstates executable investment when it is treated as equivalent to financial close.

The commitment-to-close gap may be expressed in financial and temporal terms. The financial dimension is the difference between announced or approved funding and the financing legally secured at close. The temporal dimension is the period between initial commitment and actual close. A wide financial gap indicates incomplete mobilisation, while a long temporal gap signals weak preparation, unresolved risks or slow institutional decisions. Both dimensions provide stronger evidence of project bankability than announcements alone.

2.1.4. Project Bankability

Bankability is the capacity of a project to obtain finance on terms acceptable to its sponsors and financiers. It depends on whether expected cash flows, contractual protections and risk allocation provide a sufficient risk-adjusted return. It is therefore relational rather than purely technical. A project considered bankable by a concessional lender may remain unacceptable to a commercial bank, pension fund or international equity investor.

The principal bankability conditions include technically credible design, realistic cost estimates, predictable revenue, capable sponsors, creditworthy off-takers, enforceable contracts, regulatory stability and adequate risk mitigation. Renewable-energy projects also require clear grid access, curtailment rules, tariff adjustment and payment security. Transport projects require credible demand forecasts, land access, construction certainty and a sustainable revenue or availability-payment mechanism.

Egli (2020) showed that renewable-energy investment risks changed as technologies matured and markets developed. Declining technology costs reduced some risks, but curtailment, market-price and policy risks became more important. Bankability must therefore be assessed at project level and at the point of financing. A technologically mature project may remain unbankable where its revenue or institutional environment is uncertain.

2.1.5. Project Preparation and Transaction Readiness

Project preparation converts a policy idea into an appraisable transaction. It covers prefeasibility and feasibility studies, engineering design, demand analysis, environmental and social assessment, land acquisition, legal due diligence, financial modelling and procurement planning. Transaction readiness is reached when these elements are sufficiently complete for lenders and investors to price risk and negotiate binding agreements.

Weak preparation increases information asymmetry. Sponsors may possess better information about costs and implementation constraints than potential financiers, while governments may underestimate contingent liabilities. Lenders respond through higher risk premiums, restrictive conditions or withdrawal. Preparation facilities can reduce this uncertainty, although technical assistance creates value only when its studies are credible, coordinated and incorporated into procurement and financing decisions.

For climate-resilient infrastructure, preparation must also identify physical climate risks and their financial consequences. Engineering adaptation, insurance, maintenance and emergency-response costs should appear in the financial model. Excluding such costs may make a project appear affordable at approval but expose investors and governments to higher lifecycle losses.

2.1.6. Risk Allocation and Credit Enhancement

Risk allocation assigns responsibility for a project risk to the party best able to control, absorb or insure it. Construction risk is generally allocated to the engineering contractor, operational risk to the operator and demand risk to the party capable of influencing service demand. Governments often retain risks arising from legislation, permits, compulsory acquisition and sovereign action. Currency and off-taker risks may require shared arrangements because neither private sponsors nor individual government agencies can manage them efficiently.

Credit-enhancement instruments alter this allocation. Partial-risk guarantees may cover public-contract breaches, while partial-credit guarantees support scheduled debt repayment. Political-risk insurance covers specified events such as expropriation, transfer restrictions or political violence. Liquidity facilities address

temporary payment shortfalls, and viability-gap funding covers the portion of capital cost that cannot be recovered through affordable user charges.

Duma and Muñoz Cabré (2024) found that risk-mitigation instruments supported renewable-energy investment in West and Central Africa, but their effectiveness depended on accurate diagnosis of the binding constraint. A sovereign guarantee could strengthen an off-taker obligation but would not correct weak demand forecasts or incomplete land acquisition. Effective blending therefore required instrument-risk correspondence.

2.1.7. Currency, Revenue and Off-Taker Risks

Currency risk arises when project revenue is earned in local currency while debt service, equipment costs or investor returns are denominated in foreign currency. Depreciation can weaken debt-service capacity, increase tariffs or create contingent liabilities for government. Full foreign-currency indexation protects investors but transfers the cost to consumers or public budgets. Local-currency finance reduces mismatch but remains constrained by short maturities, limited bond markets and institutional-investor regulations.

Revenue risk concerns the uncertainty of project income. Renewable-energy projects usually depend on long-term power-purchase agreements, while transport projects may rely on tolls, fares, availability payments or government transfers. A well-designed contract cannot eliminate risk if the payer lacks financial capacity. Off-taker creditworthiness is therefore central to electricity-project bankability. Payment delays, technical losses, politically constrained tariffs and weak collection can make otherwise viable projects unacceptable to lenders.

High financing costs reinforce these constraints. Ameli et al. (2021) demonstrated that developing economies can become trapped in a cycle in which perceived risk raises capital costs, limited investment weakens transition capacity and the resulting infrastructure deficit sustains risk. The IEA (2023) similarly estimated that capital costs for utility-scale clean-energy projects in Africa were at least two to three times those in advanced economies.

2.1.8. Additionality, Mobilisation and Public Value

Private-capital mobilisation is commonly reported as the ratio of commercial capital attracted to public or concessional resources committed. Although useful, this ratio can reward transactions that attract large private volumes without demonstrating whether public support was necessary. It can also favour mature mitigation technologies over adaptation projects whose benefits are less easily monetised.

A fuller assessment should examine financial additionality, development impact, concessionality, distribution of risks and fiscal exposure. Public value declines when government absorbs extensive downside risk while private investors retain most upside returns. It also declines when guarantees create large contingent liabilities that are omitted from public accounts.

Bogner (2025) showed that private climate finance depends on complex legal and technical practices that transform projects into investible assets. These practices can facilitate transactions, but they may also privilege financial requirements over local development priorities. Blended finance should therefore be judged by whether it addresses a documented barrier, achieves financial close, preserves affordability and produces measurable climate resilience.

2.1.9. Conceptual Relationship

The study conceptualised financial close as the immediate outcome of bankability. Project-preparation quality, institutional credibility, blended-finance instruments and risk allocation constituted the principal explanatory conditions. Currency volatility, weak off-takers, regulatory instability and unresolved land or procurement issues constrained their effects.

Blended finance was not assumed to affect financial close directly in every case. Its effect depended on whether the selected instrument addressed the project's binding risk. Project preparation reduced information uncertainty; institutional credibility strengthened contractual expectations; and appropriate risk allocation prevented investors from bearing risks outside their control. Their interaction determined whether a capital commitment became executable finance.

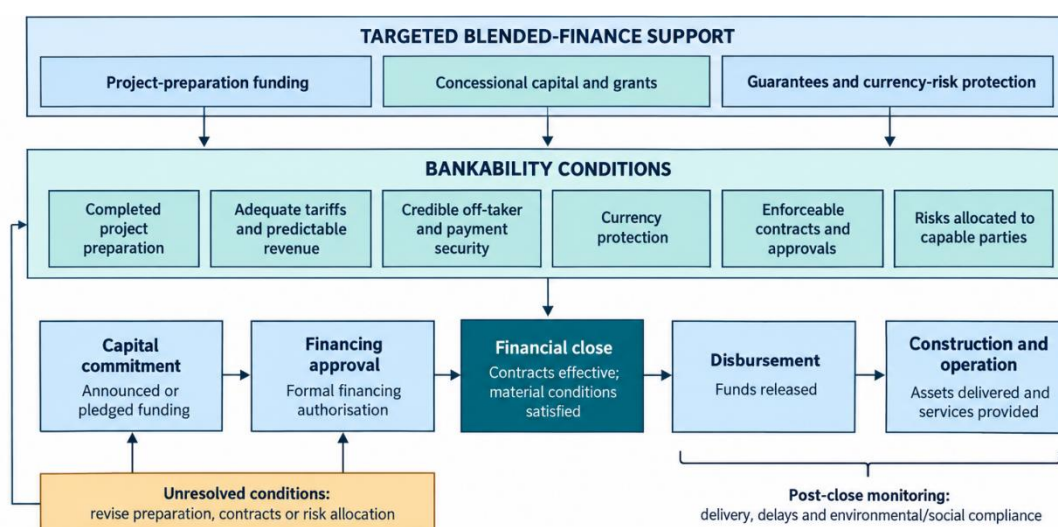


Figure 1. Blended-finance commitments, project bankability and implementation outcomes.

Source: Author's conceptual synthesis based on the study's literature review.

2.2. Theoretical Review

The study was anchored principally in risk-allocation theory and supported by institutional theory, information-asymmetry theory and transaction-cost economics. Risk-allocation theory holds that project risks

should be assigned to the party best able to influence their probability, control their consequences or insure them at the lowest cost. Efficient allocation reduces the total risk premium and improves the likelihood of financial close. Allocation differs from wholesale risk transfer. Requiring a private party to accept an uncontrollable political, currency or regulatory risk may increase bids, create renegotiation or prevent financing altogether. Public guarantees become defensible where government controls the underlying risk and where the guarantee produces measurable additionality.

Applied to blended finance, the theory explains why the type and placement of concessional support matter. Subordinated debt can reduce senior-lender exposure, but it cannot repair a weak power-purchase agreement. Political-risk insurance can protect against expropriation, but it cannot make unrealistic traffic forecasts reliable. A viable structure matches each instrument with the risk preventing commercial participation. The study therefore assessed risk-instrument correspondence rather than treating the presence of concessional finance as sufficient evidence of bankability.

Institutional theory explains how formal rules, regulatory bodies and established practices shape investor expectations. Infrastructure assets are long-lived and largely immobile after construction. Investors consequently depend on credible tariffs, permits, dispute-resolution systems and contractual enforcement over several years. Unpredictable policy changes increase expected transaction costs and required returns, even when project engineering remains sound. Egli (2020) found that credible and stable policies contributed materially to declining renewable-energy investment risk, confirming that technological progress alone did not determine financing conditions.

Information-asymmetry theory explains why incomplete project preparation delays finance. Sponsors, public agencies, contractors and lenders hold unequal information about costs, demand, land, environmental obligations and implementation capacity. When lenders cannot distinguish sound projects from weak ones, they demand more security, impose extensive conditions or decline participation. Feasibility studies, independent verification, transparent procurement and financial modelling reduce this asymmetry. Guarantees cannot substitute permanently for reliable information because poorly prepared projects may fail even when lenders are protected.

Transaction-cost economics extends this reasoning by treating negotiation, due diligence, monitoring, enforcement and renegotiation as real project costs. Infrastructure transactions involve many parties, long maturities and interdependent contracts. Fragmented approvals, inconsistent regulations and bespoke documentation increase transaction costs and extend the commitment-to-close period. Standardised contracts and coordinated approvals can shorten negotiations, but excessive standardisation may ignore project-specific risks.

Together, the theories predicted that financial close would be more likely where preparation reduced information gaps, institutions made long-term commitments credible, and risks were assigned to capable parties. Blended finance improved bankability only where it corrected these weaknesses without generating excessive public exposure. This integrated position also addressed the critical concern that private-finance mobilisation may transfer commercial risks to the state while presenting the result as additional investment (Bernards, 2024; Bogner, 2025).

2.3. Empirical Review

Empirical evidence confirmed a persistent mismatch between Africa's climate-investment requirements and actual finance. CPI (2024) estimated that annual climate-finance flows to Africa increased to approximately US\$43.7 billion in 2021–2022, but only about 23% of estimated needs were being met. The financing composition also remained heavily public and debt-based. Private finance was concentrated in markets and technologies with established revenue models, leaving adaptation and resilience projects comparatively underfunded.

The investment deficit could not be explained by a global shortage of clean-energy capital. Global clean-energy investment was expected to reach about US\$2 trillion in 2024, while emerging and developing economies outside China continued to receive an inadequate share (IEA, 2024). Africa attracted approximately 2% of global clean-energy investment despite substantial renewable resources and infrastructure needs (Reuters, 2024a). This distribution suggested that capital followed perceived risk, market depth and transaction readiness more readily than physical investment potential.

Ameli et al. (2021) quantified how high financing costs reduced low-carbon investment in developing economies. Their findings showed that differences in capital costs could materially alter technology choices and slow decarbonisation. Egli (2020) similarly found that policy credibility, data quality and improved risk assessment reduced renewable-investment premiums, while price and curtailment risks gained importance as markets matured. Together, these studies indicated that reducing equipment costs was insufficient where financing and institutional risks remained high.

Evidence on blended finance was more qualified. OECD (2025) reported that mobilising private capital required larger volumes of concessional and multilateral development finance, but mobilisation varied substantially by country, sector and instrument. Guarantees and direct investment often mobilised more private capital than grants, yet mobilisation ratios did not establish causality or development additionality. Projects that already possessed strong sponsors and predictable revenues were more likely to attract private investors and could therefore appear more successful under mobilisation-based evaluation.

Project-level evidence demonstrated the importance of risk diagnosis. Duma and Muñoz Cabré (2024) found that guarantees, concessional finance and risk-transfer mechanisms supported renewable projects in West and Central Africa, particularly where they addressed political, currency and off-taker risks. However, instruments were less effective when projects lacked basic preparation or when regulatory and contractual problems remained unresolved. This supported the study's proposition that blended finance operated through bankability conditions rather than as an independent source of project success.

South Africa's renewable-energy procurement experience showed how competitive procurement, standardised documentation and long-term power-purchase arrangements could attract private investment. Yet grid-capacity constraints and uncertainty surrounding the public utility later affected project schedules. The case illustrated the

dynamic character of bankability: a procurement framework could reduce entry risk while transmission and off-taker limitations prevented timely closure or operation.

Kenya's renewable-energy experience similarly combined strong resource potential and development-finance participation with land, transmission, public-liability and contractual challenges. Nigeria's market reflected large electricity demand and significant off-grid opportunities, but currency depreciation, tariff shortfalls and power-sector payment weaknesses raised financing costs. Côte d'Ivoire benefited from experience with independent power producers and development-finance guarantees, although sovereign, currency and implementation risks remained relevant. These country patterns showed why national investment volumes alone could not explain project outcomes.

Transport infrastructure introduced additional difficulties. Demand forecasts were often uncertain, land acquisition was politically sensitive, and projects required coordination across several public agencies. Climate resilience generated benefits through avoided disruption and reduced future losses, but these benefits rarely produced direct revenue. Viability-gap funding or availability payments could improve affordability, although both created long-term fiscal obligations. Transparent contingent-liability assessment was therefore essential.

Critical studies questioned the assumption that making infrastructure investible necessarily produced equitable development. Bernards (2024) argued that private-finance mobilisation often depended on state intervention and risk absorption rather than the retreat of the public sector. Bogner (2025) found that legal and financial specialists played a central role in structuring climate transactions, but contractual complexity could reduce transparency and limit participation by public-interest actors. These studies did not reject blended finance; they showed that mobilisation should be assessed alongside affordability, accountability and the distribution of risk.

Overall, the evidence identified four consistent determinants of financial close: adequate project preparation, credible revenue, appropriate risk allocation and institutional reliability. It also revealed three gaps. First, most studies examined national finance flows or portfolios rather than tracing projects through commitment, approval, close and disbursement. Second, mobilisation studies rarely distinguished between the existence of an instrument and its success in addressing a binding project risk. Third, cross-country comparisons seldom combined financing-stage evidence with project-level risk-allocation analysis.

The present study addressed these gaps by comparing financially closed and delayed projects in Nigeria, Kenya, South Africa and Côte d'Ivoire. It treated financial close as an observable bankability outcome and examined how preparation, blended-finance design, institutional conditions and risk allocation explained the conversion, or non-conversion, of capital commitments into executable infrastructure investment.

3. Method

3.1. Research Design

The study adopted a qualitative comparative multiple-case design supported by documentary analysis, process tracing and structured project scoring. The design was appropriate because project bankability resulted from interactions among financing instruments, contractual arrangements, institutional decisions and project-specific risks that could not be represented adequately by aggregate climate-finance data. Comparative case analysis also allowed the study to explain why projects exposed to similar continental financing constraints produced different financial-close outcomes (Glette & Wiig, 2022; Greenhalgh, 2025).

The unit of analysis was the individual infrastructure project or integrated project programme. Each case was traced through preparation, financing commitment, approval, financial close, disbursement and implementation. The study treated financial close as the primary bankability outcome. It did not assume that an announced commitment, signed memorandum or development-finance approval constituted secured investment.

Document analysis provided the principal method because financing structures, guarantees, project costs, implementation conditions and closure dates were recorded in appraisal reports, financing agreements and institutional disclosures. Morgan (2022) maintained that qualitative document analysis could support systematic inference where documents were selected transparently, interpreted within their institutional context and assessed for authenticity and purpose.

3.2. Case Selection

The geographical cases were Nigeria, Kenya, South Africa and Côte d'Ivoire. These countries were selected purposively because they represented distinct West, East and Southern African regulatory and project-finance environments. They also contained renewable-energy projects supported by governments, development-finance institutions and private sponsors.

Within the countries, six embedded project cases were selected through maximum-variation sampling. Selection required: a clear renewable-energy or climate-resilience objective; involvement of public, concessional or development finance; identifiable project-financing stages; adequate documentary evidence; and variation in financial-close or implementation outcomes.

Table 1. Selected project cases and analytical status.

Country	Project or programme	Technology	Principal analytical outcome
Nigeria	Nigeria Electrification Project	Solar mini-grids and stand-alone systems	Programme implementation and private-provider mobilisation
Nigeria	Utility-scale solar IPP programme	Solar photovoltaic	Prolonged delay between signed agreements and financial close
Kenya	Menengai geothermal IPP programme	Geothermal power	Public resource development combined with private generation
South Africa	Redstone CSP project	Concentrated solar power with storage	Financial close achieved after contractual and sponsor delays
Côte d'Ivoire	Boundiali solar project	Solar photovoltaic and storage	Public-concessional financing and operational completion
Côte d'Ivoire	Singrobo-Ahouaty hydropower project	Hydropower	Private project finance followed by implementation delays

The Nigeria Electrification Project had an initial World Bank structure that included US\$150 million in International Development Association finance for its solar-hybrid mini-grid component and an expected US\$180 million contribution from private developers (World Bank, 2018). Redstone reached financial close in 2021 after earlier delays and secured finance from African and international development and commercial institutions (African Development Bank [AfDB], 2022). These contrasting pathways made the sample appropriate for commitment-to-close analysis.

The sample concentrated on renewable-energy infrastructure because comparable financial-close data for climate-resilient transport projects were substantially less complete. This restriction improved comparability across revenue structures, power-purchase agreements and off-taker arrangements.

The sample included different financing arrangements to explain variation in the conversion of commitments into executable investment. Cases combining development support with documented commercial participation were examined as implemented blended-finance arrangements. Boundiali was retained as a public-concessional comparator because its disclosed financing package comprised a KfW loan, an EU grant and a state contribution, without demonstrated commercial-capital mobilisation. Nigeria’s utility-scale solar IPP programme represented a proposed blended-finance pathway whose anticipated guarantees and private investment had not produced material financial close by the evidence cut-off. These distinctions allowed comparison of financing outcomes without treating all public-supported renewable-energy projects as completed blended-finance transactions.

3.3. Study Period and Evidence Cut-Off

The analysis covered project developments occurring between January 2015 and August 2026. The period captured the expansion of blended climate finance, renewable-energy procurement and development-finance risk-mitigation instruments across the selected countries. Documents published before 2015 were consulted only where they established an original concession, power-purchase agreement or financing obligation that remained relevant during the study period. Documentary searches and project-status verification ended on 31 August 2026.

3.4. Documentary Sources and Corpus Construction

The final corpus comprised 48 documents. It consisted of 32 project and country documents, eight cross-country institutional reports and eight peer-reviewed studies. National and project documents included appraisal reports, financing announcements, guarantee information, procurement records, environmental and social assessments, implementation reports and official project-status disclosures.

Documents were obtained from the World Bank, AfDB, International Finance Corporation, development-finance institutions, government ministries, energy regulators, procurement agencies, project companies and recognised evaluation repositories. Reports from the Climate Policy Initiative, IEA, OECD and Stockholm Environment Institute supplied cross-case evidence. Peer-reviewed studies provided analytical support concerning financing costs, investment risks, private-capital mobilisation and institutional credibility (Ameli et al., 2021; Bernards, 2024; Bogner, 2025; Egli, 2020).

A document was included when it identified the project, financing amount, instrument, financier, date, risk or implementation condition relevant to at least one study objective. Promotional statements without verifiable financing or implementation information were excluded. Duplicate documents, undated summaries, unsupported media claims and documents that described national ambitions without project-level evidence were also removed.

3.5. Evidence Authentication and Hierarchy

The study applied a four-level source hierarchy. Level 1 comprised executed legislation, financing agreements, appraisal reports and official completion or implementation reports. Level 2 covered official government, multilateral lender and development-finance disclosures. Level 3 consisted of audited project-company reports and identifiable sponsor publications. Level 4 covered reputable news and industry reporting.

Project costs, financing amounts and closure dates were drawn principally from Levels 1 and 2. Level 3 and Level 4 sources were used to update implementation status or explain documented delays. A contested fact was retained only when it was supported by a primary document or at least two independent sources. This procedure reduced the risk of treating projected financing as actual disbursement.

3.6. Data Extraction

A structured extraction sheet recorded country, project, sector, capacity, sponsor, off-taker, total cost, financing instrument, public or concessional amount, commercial capital, commitment date, approval date,

financial-close date, disbursement status and operational status. It also recorded evidence of construction, currency, revenue, off-taker, regulatory, political, environmental and climate risks. Four financing indicators were computed:

$$\text{Commitment Conversion Ratio} = \frac{\text{Capital secured at financial close}}{\text{Announced or committed capital}} \times 100$$

$$\text{Disbursement Ratio} = \frac{\text{Cumulative amount disbursed}}{\text{Approved financing}} \times 100$$

$$\text{Private Mobilisation Ratio} = \frac{\text{Commercial capital mobilised}}{\text{Public and concessional capital committed}}$$

$$\text{Time to Financial Close} = \text{Financial-close date} - \text{initial commitment date}$$

The first two indicators distinguished financing announcements from executable and transferred funds. The mobilisation ratio measured the volume of commercial capital associated with each unit of public or concessional support. It was not treated automatically as proof of additionality because high mobilisation could occur in projects that were already commercially attractive (Bernards, 2024; OECD, 2025).

3.7. Project Bankability Assessment Framework

A ten-criterion Project Bankability Assessment Framework was constructed from the conceptual review and project-finance evidence. Each criterion was scored 0, 1 or 2.

Table 2. Operationalisation of project bankability.

Criterion	0	1	2
Project preparation	Material studies incomplete	Studies partly completed	Verified preparation completed
Revenue certainty	No credible revenue arrangement	Conditional or disputed revenue	Enforceable long-term revenue
Off-taker strength	Weak and unsupported	Partial support	Creditworthy or guaranteed
Tariff adequacy	Non-cost-reflective	Adjustment uncertain	Contractually adequate
Currency protection	Material mismatch unmanaged	Partial mitigation	Effective hedge or matching
Regulatory certainty	Major approval uncertainty	Some unresolved approvals	Material approvals secured
Risk allocation	Risks poorly assigned	Mixed allocation	Risks assigned to capable parties
Guarantee coverage	No material enhancement	Limited coverage	Relevant risks adequately covered
Sponsor capacity	Capacity unverified		Strong technical and financial record
Environmental and social readiness	Material conditions unresolved	Partial compliance	Requirements substantially completed

The maximum project score was 20. Scores were converted into percentages:

$$PBAI_i = \frac{\sum_{j=1}^{10} S_{ij}}{20} \times 100$$

Projects scoring below 25% were classified as weakly prepared; 25–49.9% as limited; 50–74.9% as transitional; and 75–100% as strongly bankable. Equal weighting was retained because no defensible empirical basis existed for assigning differential weights. Sensitivity analysis therefore recalculated the rankings after revenue certainty, off-taker strength, currency protection and risk allocation were assigned double weights.

3.8. Process Tracing and Thematic Analysis

Process tracing reconstructed the sequence connecting project conception, preparation, commitment, contractual conditions, financial close, disbursement and implementation. Attention was given to decisions or events that altered project progression, including guarantee approval, power-purchase-agreement execution, sponsor replacement, tariff renegotiation, land disputes and currency deterioration.

The documents were also coded thematically. The initial categories reflected the conceptual framework: project preparation, revenue, off-taker, currency, construction, regulation, procurement, environmental and social conditions, guarantee design and institutional coordination. Additional codes were retained when repeated evidence revealed a distinct constraint. Thematic analysis followed a systematic process of familiarisation, coding, category consolidation, cross-case comparison and interpretation (Kiger & Varpio, 2020).

3.9. Reliability, Validity and Ethical Considerations

Reliability was strengthened through a written codebook, uniform extraction template and evidence-linked scoring sheet. Every bankability score was connected to a document and page or section reference. Conflicting evidence was recorded rather than silently reconciled. The project rankings were subjected to alternative weighting and the exclusion of lower-level sources.

Construct validity was strengthened by separating commitments, approvals, financial close and disbursement. Triangulation across lender, government and sponsor documents reduced dependence on any institution’s account. Transparent coding remained more important than reporting a reliability coefficient without an independent second coder, a concern consistent with current guidance on qualitative coding (O’Connor & Joffe, 2020).

The study used publicly available institutional and corporate documents and collected no personal data. Formal participant consent was therefore unnecessary. Ethical attention centred on accurate attribution, balanced treatment of disputed project outcomes and avoidance of unsupported claims about institutions or sponsors.

4. Results and Discussion

4.1. Project and Financing Profiles

The six cases displayed substantial variation in financing structure, time to financial close and implementation outcome. Four projects or programmes secured their principal financing, one recorded mixed closure across several embedded facilities, and Nigeria’s utility-scale solar programme remained materially unresolved by the evidence cut-off date.

Table 3. Project financing and implementation profiles.

Project/programme	Indicative cost or commitment	Main financing structure	Financial-close position	Status at August 2026
Nigeria Electrification Project	US\$550 million	World Bank IDA and AfDB finance, grants and private-provider investment	Programme financing secured; individual subprojects closed progressively	Mini-grids and stand-alone systems under implementation
Nigeria utility-scale solar IPPs	Approximately US\$2.5 billion proposed	Private IPP capital supported by PPAs and proposed guarantees	Material financial close not achieved	Programme remained delayed
Menengai geothermal IPPs, Kenya	Project-specific finance; two disclosed plants exceeded US\$190 million	Public steam-field development, DFI loans, IPP equity and long-term PPAs	Mixed; closures occurred at different dates	One plant operating and others at different implementation stages
Redstone CSP, South Africa	ZAR11.6 billion	Sponsor equity, DFI and commercial-bank debt	Achieved in May 2021	Connected and commissioned after construction delays
Boundiali solar, Côte d’Ivoire	Approximately €40 million	€27 million KfW loan, €9.7 million EU grant and €3.3 million state contribution	Funding package secured	Operational
Singrobo-Ahouaty hydropower, Côte d’Ivoire	Approximately €174.5 million	Sponsor equity and loans from development and commercial financiers	Achieved in 2019	Construction experienced extended delay

Note: Values were reported in their original currencies to avoid exchange-rate distortions. “Programme financing secured” did not imply that every subproject had reached an identical closing date. Financing classifications reflect disclosed arrangements rather than renewable-energy objectives alone. Boundiali represents public-concessional financing; Nigeria’s utility-scale solar IPPs represent proposed support with unresolved financing conditions. Neither case is treated as evidence of completed commercial-capital mobilisation through blended finance.

The Nigeria Electrification Project represented programme-level blending. Its US\$550 million structure combined World Bank and AfDB resources with private delivery of mini-grids and stand-alone solar systems. The World Bank’s original design allocated US\$150 million in IDA finance to the solar-hybrid mini-grid component and anticipated about US\$180 million from private developers (World Bank, 2018). Unlike a conventional IPP, the programme did not depend on a single financial-close event. Grants and performance-based support lowered entry costs, while private providers financed and operated individual systems.

Nigeria’s utility-scale solar IPP programme produced the sharpest commitment-to-close gap. Fourteen PPAs were signed in 2016 for approximately 1,125 MW, but tariff disagreements, currency depreciation, off-taker concerns and incomplete guarantee arrangements prevented the projects from reaching full financial close. The contrast between the two Nigerian cases was instructive. Smaller, modular projects progressed under performance-based support, while large foreign-currency IPPs remained exposed to centralised off-taker and sovereign risks. This supported Egli’s (2020) finding that technology maturity did not remove revenue, policy and market risks.

The Menengai programme used public investment to absorb geothermal exploration risk before private IPPs financed generating plants. This structure directly matched public support to a risk private investors were poorly placed to bear. The state-owned Geothermal Development Company developed the steam field and entered supply arrangements with three 35 MW IPPs. Sosian’s plant commenced commercial operation in 2023, while the Globeleq project reached financial close in 2024 with financing from the AfDB, Trade and Development Bank and Finnfund. The cases progressed unevenly, demonstrating that common resource infrastructure did not eliminate sponsor, finance and implementation differences.

Redstone reached financial close in May 2021 after delays involving its PPA and original technology partner. Its ZAR11.6 billion financing package combined sponsor equity with development and domestic commercial finance. The project achieved its first debt drawdown in 2022 (AfDB, 2022). Boundiali used a more public-concessional structure and became Côte d’Ivoire’s first utility-scale solar facility, entering operation in 2023 before its formal inauguration in 2024 (Reuters, 2024b). Singrobo-Ahouaty showed a different problem: it achieved financial close but experienced substantial construction and environmental-management delays. Financial close was therefore necessary for implementation but did not guarantee timely completion.

4.2. Commitment-to-Close Results

Comparable conversion ratios could be calculated only where project-level commitments and secured financing referred to the same transaction. The study did not calculate ratios where programmes contained several independently financed subprojects or where published sources combined public-resource development with private generation finance.

Table 4. Commitment conversion and time-to-close results.

Project/Programme	Commitment conversion ratio	Approximate commitment-to-close period	Interpretation
Nigeria Electrification Project	Not directly comparable	Progressive subproject closure	Programme structure, not single close
Nigeria utility-scale solar IPPs	0% at cut-off	More than 120 months	Commitments and PPAs did not become executable finance
Menengai geothermal IPPs	Mixed by IPP	Approximately 8–10 years from original programme schedule	Public de-risking succeeded, but private closures remained uneven
Redstone CSP	Approximately 100%	About 72 months from award to close	Finance secured after contractual and sponsor delays
Boundiali solar	Approximately 100% of disclosed package	Closing date not separately disclosed	Fully funded public-concessional project
Singrobo-Ahouaty hydropower	Approximately 100%	About 72 months from concession to close	Closure achieved, but execution remained delayed

The results exposed a measurement problem in climate-finance reporting. A high commitment conversion ratio indicated that a financing package had been secured, but it did not establish rapid implementation, private additionality or value for public resources. Boundiali converted its disclosed €40 million package into an operating asset, but most finance came from public and concessional sources. Redstone mobilised a wider group of commercial and development lenders but required several years to reach close. Singrobo secured financing yet continued to face post-close execution constraints.

Conversely, the Nigeria Electrification Project could not be evaluated using a single conversion ratio because its funds supported numerous private-provider subprojects. Its progress was better assessed through verified disbursement, commissioned systems and beneficiary connections. This finding confirmed that a single mobilisation metric should not be imposed on programmes and stand-alone projects with different financial architectures.

The Nigeria solar programme demonstrated the most serious risk of counting commitments as investment. The PPAs signalled government intent and provided potential revenue contracts, but unresolved guarantees and macroeconomic deterioration prevented commercial lenders from treating the commitments as bankable. Ameli et al. (2021) explained this pattern: higher perceived risks increase the cost of capital, and the resulting financing shortage can persist even where demand and renewable resources are strong.

4.3. Project Bankability Results

The ten-criterion assessment produced scores ranging from 25.0% to 90.0%. Menengai ranked highest because public investment absorbed exploration risk and long-term contractual arrangements supported private generation. Nigeria’s utility-scale solar programme ranked lowest because its principal revenue, currency, off-taker and guarantee risks remained unresolved.

Table 5. Project Bankability Assessment Framework scores.

Criterion	Nigeria electrification	Nigeria solar IPPs	Menengai	Redstone	Boundiali	Singrobo
Project preparation	2	1	2	2	2	2
Revenue certainty	1	1	2	2	2	2
Off-taker strength	1	0	1	1	1	1
Tariff adequacy	1	0	2	2	1	2
Currency protection	1	0	1	1	1	1
Regulatory certainty	2	1	2	2	2	2
Risk allocation	2	0	2	2	2	2
Guarantee/credit enhancement	1	0	2	1	1	2
Sponsor capacity	2	1	2	2	2	2
Environmental/social readiness	2	1	2	2	2	1
Total	15/20	5/20	18/20	17/20	16/20	17/20
PBAI (%)	75	25	90	85	80	85
Classification	Strong	Limited	Strong	Strong	Strong	Strong

Note: Scores measured bankability conditions evidenced in the documentary record. They did not measure engineering performance or social desirability.

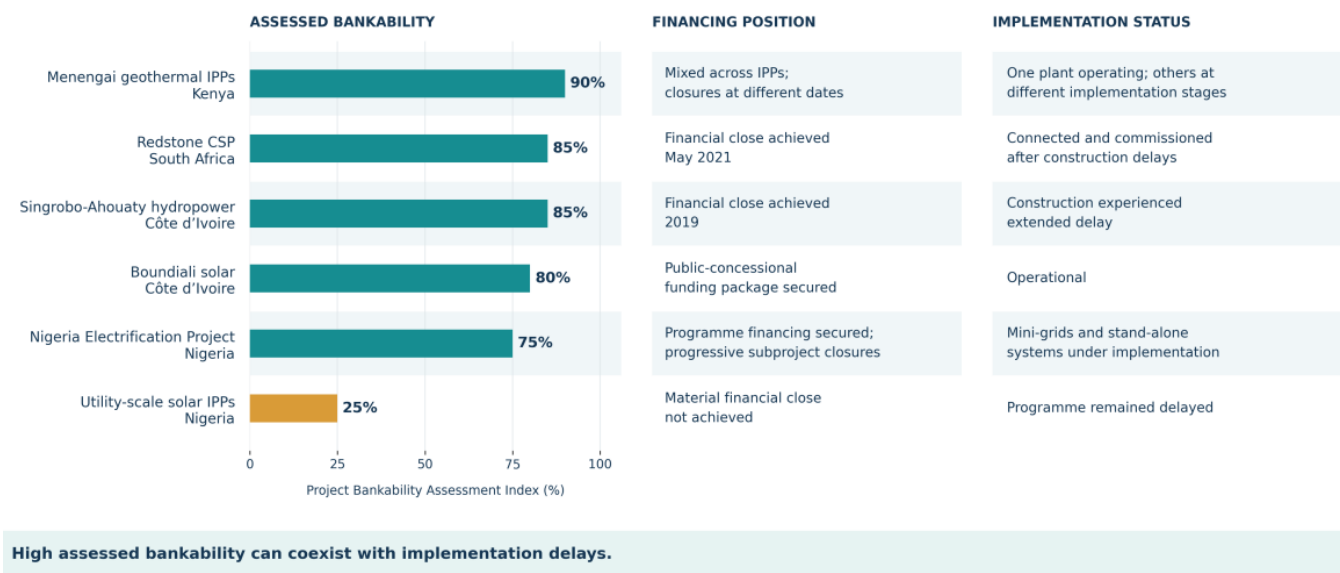


Figure 2. Assessed project bankability, financing position and implementation outcomes across six renewable-energy cases.
Source: Author’s calculations and documentary synthesis from Tables 3–5; evidence cut-off: August 2026.

Five cases crossed the 75% strong-bankability threshold. This did not mean they had identical risk profiles. Menengai’s 90.0% score reflected a clear division between public steam-field risk and private generation. Redstone’s 85.0% score reflected enforceable revenue and capable sponsors, but its weaker off-taker and currency scores captured continuing exposure to Eskom and macroeconomic conditions. Boundiali’s 80.0% score resulted from complete concessional funding and government support, although its capacity to mobilise commercial capital was limited.

Singrobo’s 85.0% score alongside prolonged construction delay revealed an important distinction between financial and implementation bankability. Its agreements were adequate to obtain finance, but post-close environmental, construction and community issues affected delivery. The result indicated that the bankability index should be interpreted with implementation evidence rather than as an unconditional predictor of timely completion.

The sensitivity analysis assigned double weights to revenue certainty, off-taker strength, currency protection and risk allocation, increasing the maximum weighted score from 20 to 28. Menengai scored 89.3%, Redstone and Singrobo-Ahouaty scored 85.7% each, Boundiali scored 78.6%, the Nigeria Electrification Project scored 71.4%, and Nigeria’s utility-scale solar IPPs scored 21.4%. The comparative ranking remained unchanged. However, the Nigeria Electrification Project moved from the strong to the transitional category, while Nigeria’s solar IPPs moved from limited to weakly prepared. The results therefore demonstrated stability in relative ranking but sensitivity in categorical classification. The index was interpreted as a structured comparative assessment rather than a definitive measure of financial-close probability.

Table 6. Sensitivity of bankability scores to alternative criterion weights.

Project/programme	Equal-weight score	Double-weight score	Classification change
Menengai geothermal IPPs	90.00%	89.30%	Strong → Strong
Redstone CSP	85.00%	85.70%	Strong → Strong
Singrobo-Ahouaty hydropower	85.00%	85.70%	Strong → Strong
Boundiali solar	80.00%	78.60%	Strong → Strong
Nigeria Electrification Project	75.00%	71.40%	Strong → Transitional
Nigeria utility-scale solar IPPs	25.00%	21.40%	Limited → Weakly prepared

Note: Weighted scores equal the weighted criterion total divided by 28, multiplied by 100. Four criteria receive weights of two; the remaining six retain weights of one. Classification thresholds remain unchanged.
Source: Author’s recalculation from Table 5.

4.4. Blended-Finance Instruments and Risk Allocation

Table 7. Blended-finance instruments and risks addressed.

Instrument	Cases using instrument	Principal risk addressed
Concessional senior debt	All except unresolved Nigeria solar IPPs	High financing cost and long maturity
Capital or viability grant	Nigeria electrification and Boundiali	Affordability and initial capital gap
Public upstream development	Menengai	Geothermal exploration and resource risk
Partial-risk or political-risk support	Menengai, Singrobo and proposed Nigeria solar IPPs	Public-payment and political risks
Local commercial-bank participation	Redstone	Local-currency funding and market knowledge
Performance-based grant	Nigeria electrification	Provider entry and connection risk
Long-term PPA or concession	Nigeria solar IPPs, Menengai, Redstone and Singrobo	Revenue certainty

Risk or constraint	Instrument or arrangement	Illustrative case	Support status	Interpretation
Exploration and resource risk	Public upstream resource development	Menengai	Implemented	Resource development precedes private generation investment
Provider entry and connection risk	Performance-based grants	Nigeria Electrification Project	Implemented	Support linked to verified provider delivery
Initial capital gap and affordability	Concessional loans and capital grants	Boundiali	Implemented	Public-concessional package supports project funding
Public-payment and political risks	Partial-risk or political-risk support	Menengai; Singrobo-Ahouaty	Implemented	Defined risks receive support; residual exposure remains
Revenue uncertainty	Long-term PPAs or concessions	Menengai; Redstone; Singrobo-Ahouaty	Implemented	Contracts support financing when payment arrangements are credible
Currency, tariff and off-taker risks	Signed PPAs and proposed guarantees	Nigeria utility-scale solar IPPs	Proposed / unresolved	Signed agreements did not produce material financial close

Analytical Proposition: Financing Support Improves Bankability When It Addresses The Binding Project Risk.
Implemented Support Does Not Imply Complete Risk Removal Or Timely Construction.

Figure 3. Correspondence between blended-finance instruments and project risks across the selected cases.
Source: Author’s synthesis of the study’s documentary evidence and Table 6.

The strongest structures matched the instrument to the binding constraint. Menengai allocated exploration and steam-development risk to the public sector while private firms assumed construction and operating risks. Nigeria’s electrification programme used performance-based grants to pay after verified connections, aligning subsidy disbursement with delivery. Redstone combined international development finance with domestic lenders, reducing exclusive dependence on foreign debt.

Nigeria’s solar programme showed the opposite condition. The proposed guarantees had not resolved the interaction among naira depreciation, dollar-linked obligations, tariff affordability and off-taker weakness. Guarantee discussions therefore became part of the delay rather than an immediate solution. Duma and Muñoz Cabré (2024) similarly found that risk-transfer instruments supported renewable investment only when they addressed clearly defined and allocable risks.

4.5. Frequency and Severity of Bankability Constraints

Table 8. Frequency of identified constraints across six cases.

Constraint	Cases affected	Frequency
Currency or foreign-exchange exposure	5	83.30%
Off-taker or public-payment weakness	5	83.30%
Construction or completion delay	4	66.70%
Guarantee or credit-enhancement limitations	3	50.00%
Regulatory or contractual delay	3	50.00%
Sponsor, ownership or procurement change	3	50.00%
Grid, steam or enabling-infrastructure dependence	3	50.00%
Environmental, land or community issues	2	33.30%

Currency and off-taker risks were the most frequent constraints, appearing in five cases each. This result explained why falling renewable-technology costs had not produced proportionate investment growth. Capital providers evaluated the reliability of project cash flows after currency conversion and the probability that the purchaser would pay. Egli (2020) likewise found that market and curtailment risks gained importance after technology risks declined.

Construction delays affected four cases, but their causes differed. Redstone faced pre-close contractual and sponsor disruption before encountering construction delays. Singrobo experienced more substantial post-close implementation and community difficulties. Menengai’s embedded plants progressed at different speeds despite using the same public steam resource. These differences supported process-specific rather than generic risk mitigation.

4.6. Cross-Case Discussion

The findings showed that blended finance improved bankability when it performed three linked functions: reducing information uncertainty, assigning risks to capable institutions and creating credible project revenue. Capital volume alone did not perform these functions. Nigeria’s unresolved solar IPPs possessed large announced investment values and signed PPAs, but these commitments remained insufficient because the underlying currency and payment risks were not financeable.

Public intervention also took different forms. Menengai used public investment to create a common geothermal resource that private generators could use. Boundiali relied predominantly on concessional and state capital. Redstone combined development and commercial lending, while the Nigeria Electrification Project paid private providers against distributed-energy delivery. These structures could not be compared meaningfully through mobilisation ratios alone.

The comparison showed that commercial-capital mobilisation and infrastructure delivery were distinct outcomes. Boundiali’s public-concessional package supported operational infrastructure without demonstrated commercial mobilisation, whereas Nigeria’s utility-scale solar programme sought substantial private investment but remained delayed. Boundiali therefore provided a comparator for assessing delivery under public-concessional finance, rather than evidence of successful blending. Nigeria’s solar IPPs illustrated the limitations of proposed support where payment, tariff and currency risks remained unresolved. The findings supported assessment of both

financing structure and implementation outcome, while reserving claims of blended-finance effectiveness for arrangements with documented commercial participation.

The comparative evidence supported a commitment-to-close framework in which project preparation established reliable information; blended instruments addressed specific financing barriers; institutional credibility supported contracts; and appropriate risk allocation reduced required returns. Financial close occurred when these elements operated together. Implementation then depended on continued construction management, social legitimacy and institutional performance.

The principal result was therefore clear: Africa's climate-infrastructure deficit was not solely a shortage of committed funds. It was also a shortage of projects whose revenue, currency exposure, preparation and contractual risks had been resolved sufficiently to convert commitments into enforceable and drawable finance.

5. Summary, Recommendations and Conclusion

5.1. Summary of Findings

The study examined how blended-finance arrangements influenced the bankability and financial-close outcomes of selected renewable-energy infrastructure projects in Nigeria, Kenya, South Africa and Côte d'Ivoire. It applied a comparative multiple-case design, documentary analysis, process tracing and a ten-criterion Project Bankability Assessment Index to 48 documents covering six project cases.

The findings showed that the availability of committed capital did not guarantee financial close or implementation. Five cases achieved strong bankability scores, but their financing pathways and implementation outcomes differed. Menengai recorded the highest score at 90.0%, followed by Redstone and Singrobo-Ahouaty at 85.0% each, Boundiali at 80.0% and the Nigeria Electrification Project at 75.0%. Nigeria's utility-scale solar IPP programme recorded 25.0%, reflecting unresolved revenue, currency, off-taker and guarantee risks.

Menengai demonstrated the value of allocating geothermal exploration and steam-development risks to the public sector before private investors financed power generation. Redstone showed that development and commercial finance could support a large renewable-energy project where revenue agreements and capable sponsors existed, although contractual and construction delays extended delivery. Boundiali converted a public-concessional financing package into operational infrastructure but mobilised limited commercial capital. Singrobo-Ahouaty reached financial close but experienced post-close construction, environmental and community-related delays. Financial bankability therefore did not guarantee implementation efficiency.

The comparison between Nigeria's two cases was particularly instructive. Performance-based grants and modular investment supported progressive delivery under the Nigeria Electrification Project. Conversely, approximately US\$2.5 billion in proposed utility-scale solar investment did not reach material financial close despite signed PPAs. Large project size and announced private participation could not compensate for weak payment security, tariff disagreement and foreign-exchange exposure.

Currency and off-taker risks appeared in five of the six cases, making them the most frequent constraints. Construction delays affected four cases, while guarantee limitations, contractual uncertainty, sponsor changes and dependence on enabling infrastructure each affected three. Overall, successful financial close resulted from the interaction of credible preparation, reliable revenue, institutional support, appropriate risk allocation and financing instruments directed at identified constraints.

5.2. Recommendations

5.2.1. Establish Dedicated Project-Preparation Facilities

The selected governments and development-finance institutions should fund preparation before seeking commercial commitments. Support should cover feasibility studies, engineering design, demand assessment, environmental compliance, land acquisition, financial modelling and transaction advice. Funds should be released against measurable preparation milestones. Projects should enter procurement only after completing a standard readiness assessment.

5.2.2. Match Financing Instruments to Binding Risks

Public institutions should identify the principal constraint before offering concessional support. Exploration grants should address geothermal resource risk, while partial-risk guarantees should cover defined government or off-taker obligations. Currency facilities should address foreign-exchange mismatch. General subsidies should not replace project preparation, credible tariffs or enforceable contracts. Each concessional instrument should disclose the risk addressed, expected private mobilisation and public contingent liability.

5.2.3. Strengthen Off-Taker and Revenue Security

Governments should improve utility collection, metering, loss reduction and financial reporting. Renewable-energy contracts should include transparent tariff adjustment, payment timelines and termination provisions. Escrow accounts, liquidity facilities and partial-risk guarantees should be used where temporary payment weakness threatens bankability. However, guarantees should accompany utility reform because repeated public support without operational improvement transfers unresolved commercial risk to taxpayers.

5.2.4. Expand Local-Currency Climate Finance

Domestic pension funds, insurers, development banks and capital markets should participate more actively in long-term infrastructure finance. Governments should permit prudent institutional investment in qualified infrastructure securities and support local-currency green bonds, refinancing facilities and credit-enhanced project bonds. Local-currency finance would reduce the mismatch created when project revenues are collected domestically but debt service is denominated in foreign currency.

5.2.5. Standardise Approval and Contractual Processes

Energy regulators, PPP agencies, environmental authorities and ministries should use coordinated and time-bound approval procedures. Standard PPAs, concession agreements, direct agreements and guarantee documents could reduce negotiation time while retaining project-specific schedules. A single transaction timetable should identify the responsible institution, required decision and completion deadline. Material delays and reasons for extensions should be publicly disclosed.

5.2.6. Link Disbursement to Verified Delivery

Development-finance institutions should structure disbursement around completed milestones rather than announcements. Relevant milestones include land availability, executed contracts, financing effectiveness, equipment delivery, grid connection and commissioned capacity. The performance-based approach used in distributed-energy programmes could be adapted where outcomes are measurable. This would reduce the difference between approved finance and operational infrastructure.

5.2.7. Monitor Projects Beyond Financial Close

Financiers and governments should maintain public project dashboards containing committed, approved, closed and disbursed amounts; financial-close dates; construction progress; expected commissioning; and material environmental or social issues. Post-close monitoring remained necessary because the Singrobo-Ahouaty and Redstone cases showed that financially closed projects could still experience extended implementation delays.

5.3. Conclusion

The study concluded that Africa's climate-infrastructure financing problem was partly a capital shortage and partly a bankability problem. Commitments became executable finance where project information was credible, revenue was sufficiently predictable, institutions honoured contractual responsibilities and risks were assigned to parties capable of managing them.

Blended finance improved bankability when it addressed a specific barrier. It performed strongly in Menengai by absorbing exploration risk and in the Nigeria Electrification Project by linking support to private-provider delivery. It was less effective where currency, tariff and off-taker risks remained interconnected and unresolved, as demonstrated by Nigeria's utility-scale solar programme.

Financial close should therefore replace announced commitments as a central indicator of infrastructure-investment progress. It provides stronger evidence that investors accepted the project's risk-return structure. Yet financial close should be assessed alongside disbursement and implementation because it does not ensure timely construction or equitable outcomes. Africa required more capital, but it also required better-prepared projects and more disciplined use of public risk-bearing capacity.

5.4. Contribution to Knowledge

The study developed a commitment-to-close framework that separated capital announcement, approval, financial close, disbursement and operation. It also constructed a replicable ten-criterion bankability index combining preparation, revenue, off-taker strength, tariff adequacy, currency protection, regulation, risk allocation, guarantees, sponsor capacity and environmental readiness.

Its comparative evidence showed that blended-finance effectiveness depended on instrument-risk correspondence rather than the volume of concessional capital alone. It further distinguished financial bankability from implementation performance, thereby extending project-finance analysis beyond closure status.

5.5. Limitations and Future Research

The study relied on public documents whose disclosure depth differed across projects. Some disbursement figures and financing terms remained confidential, limiting uniform computation of conversion and mobilisation ratios. The six-case sample also restricted statistical generalisation, while the bankability scores involved structured qualitative judgement.

Future studies should obtain lender and sponsor interviews, test alternative criterion weights and track projects longitudinally after financial close. Larger samples could apply event-history or survival analysis to estimate how guarantees, currency protection and project preparation affected the time required to reach financial close. Climate-resilient transport, water and urban infrastructure should also be examined once comparable financing data become available.

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