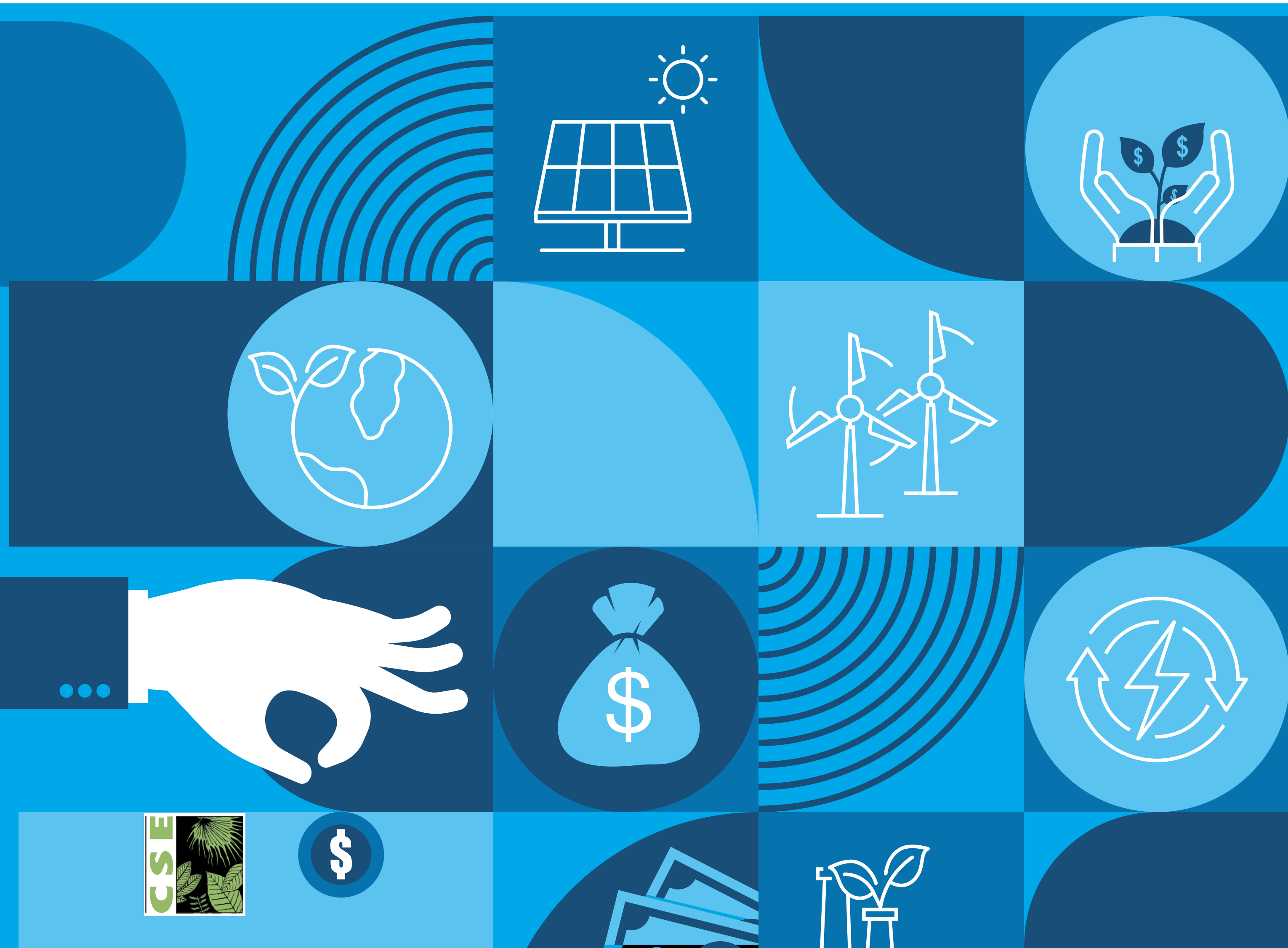

THE BORROWING FLOOR

Examining the Cost-of-Capital Crisis Keeping Climate Finance Expensive in the Global South

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CONTENTS

EXECUTIVE SUMMARY

The clean energy transition is booming, but among its many hurdles, one of the primary challenges it faces is that of financing. This paper argues that the high cost of capital facing developing countries is less a reflection of real project risk than a structural feature of how the global financial system prices risk. Emerging Markets and Developing Economies (EMDEs) hold two-thirds of the world's population and a third of global GDP yet receive only 15 per cent of clean energy investment, and face financing costs roughly twice as high as advanced economies for identical technologies.

Section 2 shows why this matters more for clean energy than for fossil fuels. Because renewables are financed almost entirely through upfront capital rather than ongoing fuel costs, the price of that capital becomes the single biggest lever on project viability, and that price is set by a mix of a base rate and a risk premium that is consistently steeper for the Global South.

Section 3 interrogates that risk premium and finds it is driven substantially by perception rather than fundamentals. Sovereign credit ratings, which anchor pricing for everything built in a country, correlate more closely with income level than with actual repayment capacity, and this bias compounds through Basel III capital rules and dollar-denominated debt, keeping borrowing costs high even where macroeconomic performance is strong.

Section 4 grounds this in India, a country with strong growth and fiscal fundamentals that still borrows 300–640 basis points more expensively than France, Italy or Japan. Primary research from Indian financiers, project developers etc. points to DISCOM payment delays, not currency or technology risk, as the dominant concern shaping financing terms on the ground.

Section 5 maps the solution space and argues that project-level de-risking tools, guarantees, payment security mechanisms, and blended finance can improve individual project bankability but cannot touch the sovereign ceiling, dollar hegemony, or rating methodology that set the borrowing floor. The paper concludes that de-risking should be treated as one tool among many, not a substitute for reform of the international financial architecture itself, including credit rating reform, deeper multilateral lending, and the broader reform agenda championed by efforts such as the Bridgetown Initiative.

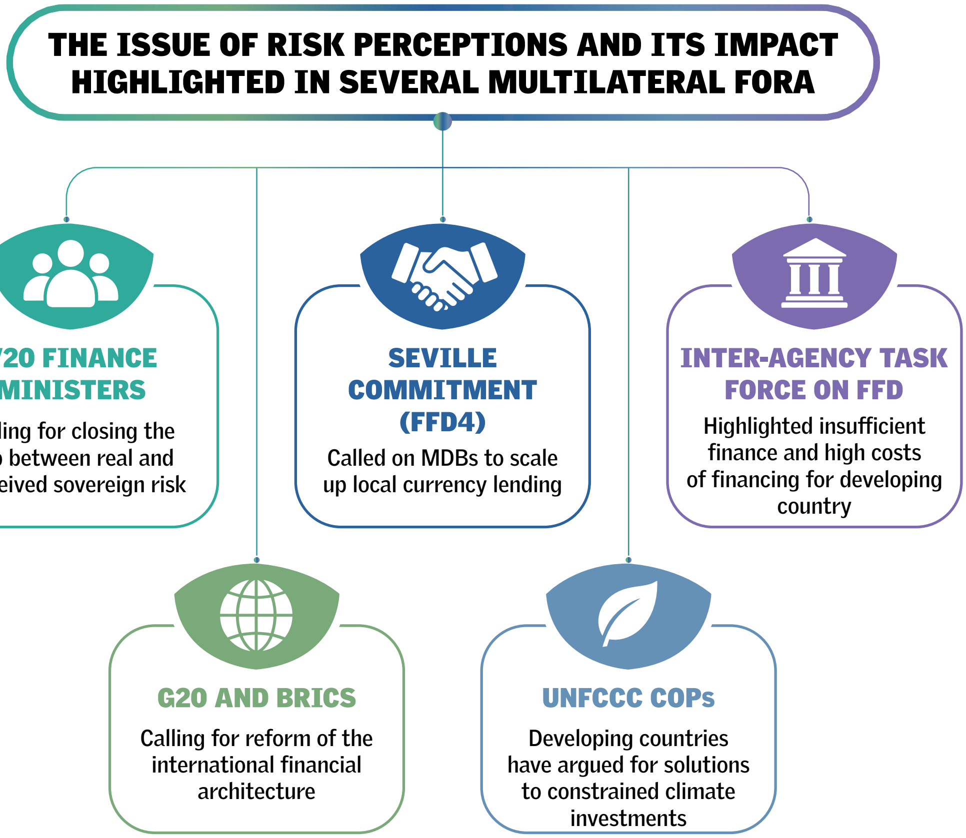
1 INTRODUCTION

- Clean energy's high upfront costs make the financing costs central to project viability, but access to affordable capital varies between developed and developing countries.
- This gap reflects not just project risks, but also structural biases in how the global financial system prices risk.
- This paper decodes how the cost of capital is shaped, how the global financial system inflates risk, the case of India, and proposed solutions and their limitations.

At its core, the clean energy transition faces a financing challenge. Unlike fossil fuels, where economics are tied to volatile supply and demand dynamics, clean energy projects are capital-intensive upfront, making financing central to every project's viability.

Yet the conditions that make capital accessible and affordable are not the same everywhere. This divergence is sharpest for Emerging Markets and Developing Economies (EMDEs), precisely the countries where support and enabling conditions for clean energy deployment is most urgently needed. EMDEs account for two-thirds of the world's population but only 15 per cent of global clean energy investment since 2020, further down from 20 per cent since 2016, despite accounting for one-third of global gross domestic product (GDP).[1,2] On average, EMDEs face financing costs that are twice as high as those in advanced economies

Figure 1: What is being said to address the issue of risk perception at the global level?



Source: CSE, Climate Vulnerability Forum,[3] UNCTAD,[4] Global Policy Forum Europe[5] for the same technologies, making the high cost of capital a structural barrier to meeting their climate goals.

While some risks exist at all levels from the project to the sovereign layer, it is an oversimplification to assume that clean energy projects in the Global South are riskier to build or operate. The global financial system still prices risk in ways that structurally disadvantage lower-income countries, regardless of project fundamentals.

Section 2 highlights how the cost of capital is structured, why it matters more for clean energy than fossil fuels, and how geography shapes financing conditions.

Section 3 maps the risks that influence the cost of capital and traces how the global financial system perpetuates this inflation.

Section 4 uses India as a case study of how these dynamics play out within a large and maturing renewable energy market.

Section 5 maps solutions that have been tabled so far and lists their limitations as they currently exist in the literature, some targeting project-level risk, others the structural conditions that keep the borrowing floor high for the Global South.

2

WHAT ARE COUNTRIES REALLY PAYING FOR?

- Unlike fossil fuel plants, clean energy technologies require most of their investment upfront, making the cost of capital a key factor in their affordability.
- Developing countries often face financing costs twice as high as those in developed countries, even for now-mature technologies such as solar.
- Both global issues like the US dollar dominance and domestic challenges such as high inflation or weak financial markets make projects more expensive to finance.

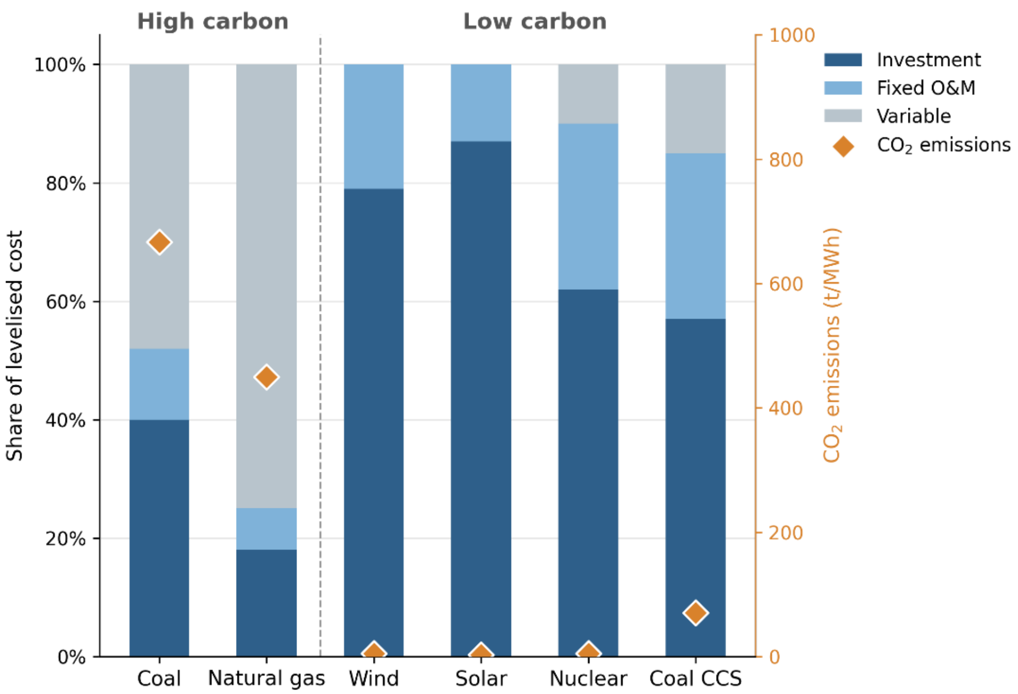
To assess whether the higher interest rate is justified, it helps to step back and look at what actually drives the cost of capital, and why it affects clean energy projects and fossil fuels so differently.

2.1 Is clean energy riskier than fossil fuels or just treated that way?

Every power project has to be paid for over its lifetime, but how that payment is structured, and when it needs to be paid, varies sharply depending on the technology being used.

Clean energy and fossil fuel-based power generation differ fundamentally in their cost structures, with important implications for how financing conditions shape projects on the ground. As illustrated in *Figure 2*, a comparison of fossil fuel and clean energy technologies shows that fossil fuel technologies are dominated by variable costs, largely driven by fuel expenditures, and operations and maintenance (O&M) costs through their lifetime.

Figure 2: Comparative analysis of cost composition of power generation technologies



Source: Lion Hirth and Jan Christoph Steckel (2016) Environ. Res. Lett. 11

Note: 'Fixed O&M' refers to fixed operations and maintenance costs. For cost composition of different power generation technologies, typical parameters were used. 7 per cent WACC and capacity factors of 60 per cent for fossil fuelled plants, 35 per cent for wind power, 20 per cent for solar power, and 90 per cent for nuclear. A price of US $30 per tonne CO_2 was assumed. Under these assumptions, the levelized costs of electricity (LCOEs) of all technologies are comparable in level (US $58–84 per MWh).

Renewable energy technologies, by contrast, have virtually no variable costs through their lifetime, but are instead dominated by high upfront investment costs required at the outset to set up these technologies. This difference in payment structure, whether the costs are upfront or spread over a period of time, shapes how exposed each technology is to financing conditions (such as interest rates and debt repayment periods).

Further, within clean energy technologies, nascent technologies face a higher cost of capital due to a range of factors including lack of scale, cost competitiveness and limited historical performance data although technologies such as solar photovoltaic (PV) and wind power have matured at this point. For instance, in 2024, solar PV was on average 41 per cent cheaper than the lowest-cost fossil fuel alternatives, while onshore wind was 53 per cent cheaper.[6] However critical technologies such as energy storage and green hydrogen face higher costs and limited investments.[7,8]

What is the cost of capital?

The cost of capital or financing cost represents the minimum return that a financier expects from their investment. It, therefore, provides a measure of risk involved in a project, with higher cost of capital reflecting higher risk.

Funding for such investments can include:

- A debt component with interest to be repaid to debtors, and
- An equity component, with financial returns expected by equity shareholders through dividends and capital appreciation.[9]

Power generation projects generally rely on two distinct financing structures: corporate (balance sheet) finance or project finance via a Special Purpose Vehicle (SPV).

- Corporate finance allows a firm to secure funding based on its overall financial health, with the firm's broader assets serving as collateral.
- In contrast, project finance utilizes a legally independent SPV, where funding is secured solely by the specific project's cash flows.

While corporate finance remains the global standard, project finance is increasingly used for large renewable projects to reduce risk and facilitate syndicated (or pooled) lending from multiple lenders.[10,11]

For an overall assessment of the cost of capital for a particular project, the debt and equity components can be factored in using weights that reflect their respective contribution to provide the Weighted Average Cost of Capital, or WACC.

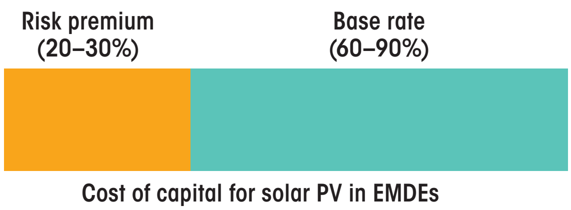
WACC = (**Cost of equity x Share of equity in total funding**) + (**Cost of debt x Share of debt in total funding**) + (**1 – Corporate Tax Rate**)

The WACC is therefore a primary measure of risk and can be used to determine the feasibility of a project.

A project's cost of capital is primarily composed of a base rate and a risk premium.

- The base rate, also known as the risk-free rate, refers to a benchmark for the minimum cost of borrowing (or interest) required to invest in a given country, such as long-term sovereign bond yields.
- The risk premium is further incurred to compensate investors for project-level, sectoral, technology-specific or country-related uncertainties in achieving expected returns.

Figure 3: Composition of cost of capital for solar PV projects in emerging economies



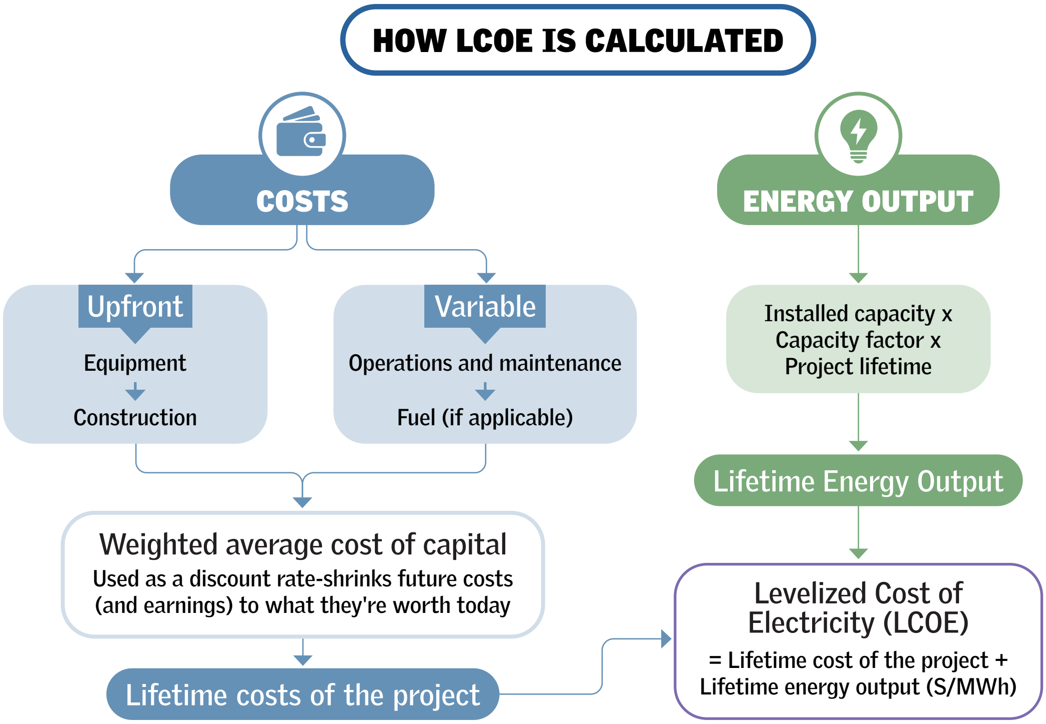
Source: IEA

The base rate constitutes the largest share of financing costs for solar PV projects in EMDEs, accounting for **60–90 per cent of the total cost of capital**, while the risk premium adds an average of **20–30 per cent** on top of the base rate.

The role of LCOE in understanding the cost of capital

A useful metric to understand the influence of financing cost on different power generation technologies at the project level is the Levelized Cost of Electricity, or LCOE. The LCOE combines all the cost elements that are directly associated with a given energy technology, including the cost of capital, equipment, construction, fuel and maintenance, and provides the expected average production cost for each unit of electricity generated over a project's lifetime. Hence, LCOE can be used to evaluate the economic competitiveness of a particular technology and serves as a metric for assessing the minimum viability of a project.[12]

Figure 4: Composition of the Levelized Cost of Electricity (LCOE) for an energy project.



Source: CSE based on U.S. Energy Information Administration, M. Kabeyi et al. (2023)
Notes:
1. Capacity factor represents the ratio of actual energy output compared to the maximum possible output, varying significantly by technology and location.
2. Money spent or earned years from now is worth less than money today. WACC is the rate used to shrink those future amounts down to what they're worth today—it doesn't add to the total cost, it adjusts it. The × signs show inputs that multiply together.

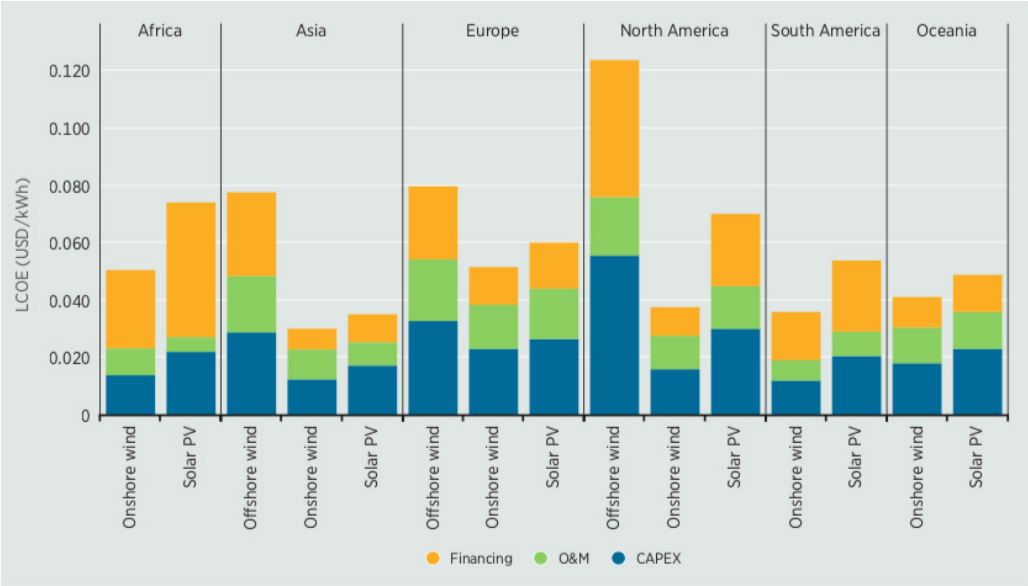
As shown in *Figure 5*, financing costs can take up a significant portion of the overall expenditures and, consequently, a high share of LCOE for renewable energy technologies.

This is especially true in vulnerable and underinvested regions like Africa, where financing costs continue to dominate project financials relative to capital expenditures or O&M costs, as shown in *Figure 5* (see *Box: Integration costs accounted for by different metrics compound the cost of financing*).[13]

2.2 How does the cost of capital differ between the developed and the developing world?

The cost of capital for the same clean energy technology can vary widely across countries. *Figure 7* provides an overview of sovereign credit ratings (an assessment of a country's creditworthiness as assigned by global credit rating agencies)

Figure 5: LCOE breakdown in selected regions



Notes: CAPEX = capital expenditure; kWh = kilowatt hour; LCOE = levelised cost of electricity; O&M = operation and maintenance; PV = photovoltaic; USD = United States dollar.

Source: IRENA (2025)

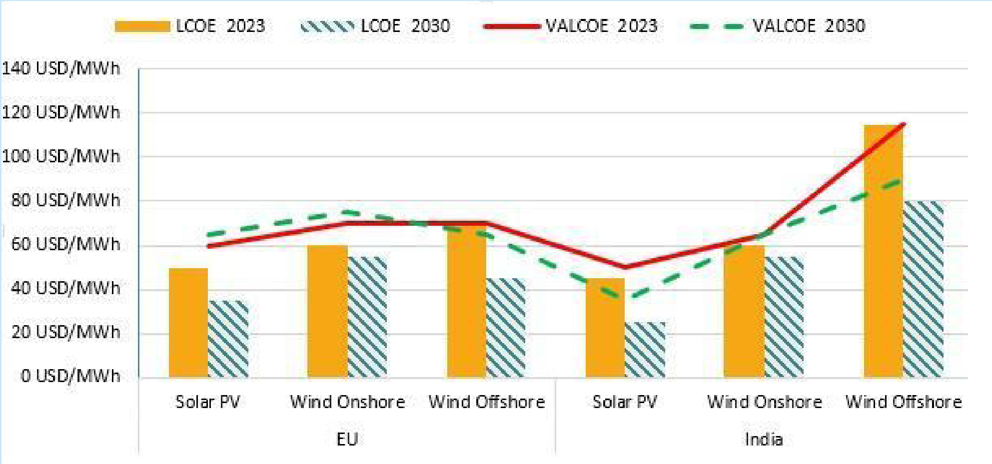
INTEGRATION COSTS ACCOUNTED FOR BY DIFFERENT METRICS COMPOUND THE COST OF FINANCING

It is important to note that while LCOE is useful to compare project-level costs for different technologies, it does not incorporate larger system-level costs such as grid upgrades and the expenses required to maintain system reliability. LCOE treats power plants as standalone units and fails to account for how they interact with existing grid infrastructure or the varying value of electricity depending on when it is produced relative to system demand. For variable renewable energy (VRE) technologies such as wind and solar, LCOE ignores integration costs, or the added system-wide expenses of accommodating the intermittency of VRE generation—which can rise as the share of VRE in the power generation mix grows.[1]

Another metric, the Levelized Avoided Cost of Electricity (LACE) measures the 'avoided cost', or the economic value the system would otherwise have to bear to supply the electricity that a new project displaces from existing generation sources. Similarly, Value-adjusted LCOE (VALCOE), a metric developed by the International Energy Agency (IEA), accounts for the 'system value' cost of a project and the box delves into how these additional costs increase the cost of financing.

The Value-Adjusted LCOE (VALCOE) adjusts the LCOE based on a project's 'system value', incorporating its contribution to system flexibility and capacity during peak demand. For VRE technologies such as solar PV, VALCOE begins to diverge upward from LCOE as penetration increases, reflecting the added costs imposed on technologies whose output is tied to weather conditions rather than system demand. Because of this reason, grid operators must increasingly invest in complementary infrastructure such as flexible backup capacity, storage, and transmission expansion to ensure reliability during peak load periods. These are the costs that VALCOE factors back into the assessed cost of the VRE technology itself.

Figure 6: Electricity generation costs by technology for EU and India in the IEA's Stated Policies Scenario



Source: IEA World Energy Outlook 2024

Figure 5 illustrates that while the LCOE of renewable technologies declines significantly in 2023–30, the value-adjusted levelized cost of electricity (VALCOE) does not fall at the same pace and, in some cases, even increases. This trend is particularly evident with solar PV and wind technologies, where falling LCOEs are offset by persistent or rising VALCOEs. In India, the pattern is striking: onshore wind shows almost no improvement in VALCOE despite lower LCOE while offshore wind retains very high VALCOE levels overall.

Consequently, such alternative metrics are able to shed light on the rising system-wide integration costs associated with higher VRE penetration. For instance, lenders and investors pricing risk into a renewable project must contend not only with the project's own revenue uncertainty, but increasingly with system-level signals such as curtailment risk, grid congestion, or declining prices on average that a VRE generator receives for the electricity it sells. As integration costs grow, they effectively raise the risk premium asked by financiers, pushing up the cost of capital for new VRE projects even when the technology costs are falling.

The pattern is observed in IEA's projections for VALCOE rising between 2023 to 2030 for solar PV and wind onshore, while LCOE appears to fall. For instance, in India, utility-scale solar LCOE held near record lows (US $29–31/MWh) through 2025 even as solar WACC rose 320 basis points from 7.08 per cent (2020) to 10.3 per cent (2024), with grid/transmission curtailment risk alone contributing roughly 14 per cent of the total risk premium.[2] The result is an increased divergence between what LCOE suggests a project should cost and what developers must actually pay to finance it.

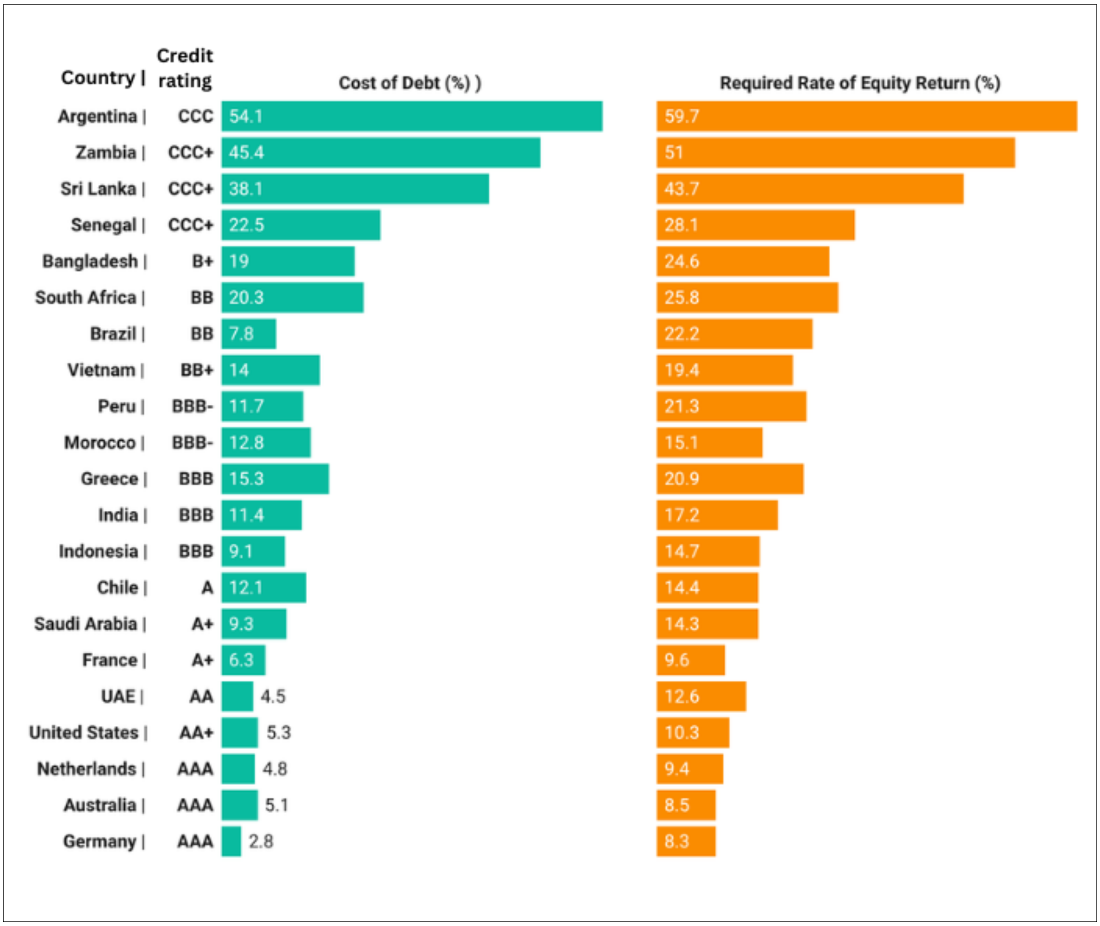
Sources:

1. Yuhji Matsuo. 2022. Re-Defining System LCOE: Costs and Values of Power Sources. *Energies, Volume 15, Issue 18*, 2022. Available at https://www.mdpi.com/1996-1073/15/18/6845

2. Saurabh Trivedi and Gireesh Shrimali. 2025. Cost of Capital for Indian Renewable Energy Projects: A Review of Methodologies, Risk Drivers, and Policy Evolution. University of Oxford, Smith School of Enterprise and the Environment, 2025. Available at https://sustainablefinance.ox.ac.uk/wp-content/uploads/2025/12/Cost-of-Capitol-for-Indian-Renewable-Energy-Projects.pdf

alongside the cost of debt (the debt component) and the required rate of return on equity (the equity component) for climate projects (especially solar energy deployment) in these countries. As per this illustration, developing countries face lower credit ratings and higher cost of capital for green investments.

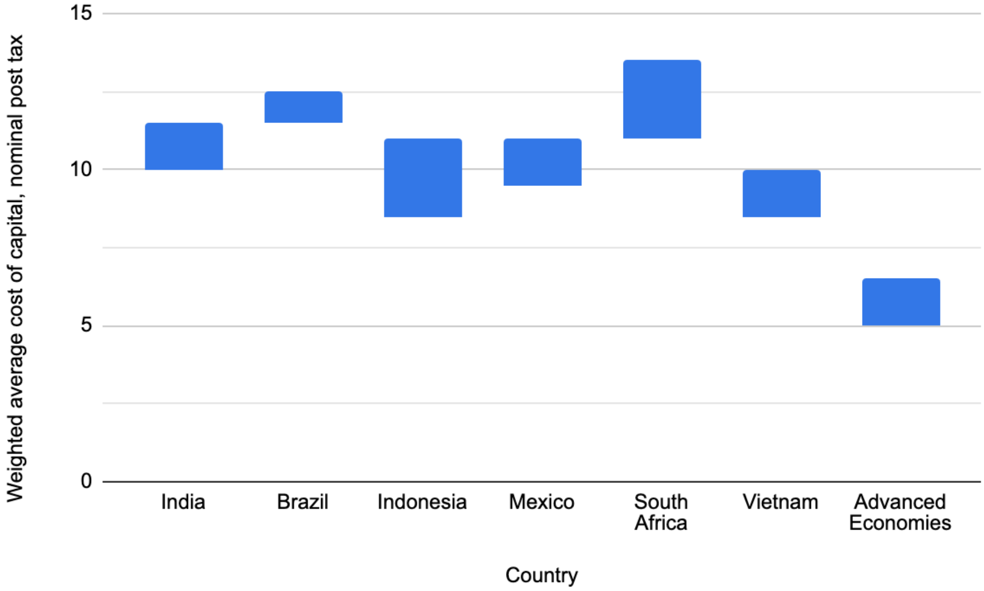
Figure 7: Country ratings and cost of capital indicators of solar energy projects for select countries



Sources: S&P Global Ratings 2025 (accessed on January 28, 2026), Climate Policy Initiative 14, 2023

Clean energy projects, even those where the technology has matured, such as utility-scale solar PV, as a result, are costlier to set up in developing countries than their developed counterparts. To illustrate this, *Figure 8* compares the financing costs for utility-scale solar PV projects in selected EMDEs and advanced economies. The figure highlights that the cost of capital can be almost twice as high in developing economies (about 8–12 per cent) compared to advanced economies (about 5–6.5 per cent), reflecting differences in underlying financing conditions.

Figure 8: Weighted average cost of capital for utility-scale solar PV projects in select economies



Source: IEA Cost of Capital Observatory, 2025

Moreover, for climate-vulnerable developing countries, physical exposure to climate-linked disasters makes borrowing more expensive. For instance, 25 developing countries, all members the Vulnerable Twenty (V20) group (a coalition of 74 climate-vulnerable nations from the Global South representing 1.81 billion people) have on average paid a 1.174 per cent higher cost of debt, limiting their access to international capital markets and worsening sovereign debt sustainability.[15]

2.3 What are the true drivers of high capital costs in the Global South?

The cost of capital for energy projects in the Global South is shaped by two distinct layers of risk:

- Global factors that are largely beyond a country's control:
    - At the global level, the structure of the international financial system plays a decisive role. The US dollar sits at the top of a global currency hierarchy, meaning that countries whose currencies are not widely held or traded internationally have limited ability to borrow in their own currency. Instead, those countries must raise debt in dollars or other hard currencies. This creates a structural mismatch where project revenues are earned in local currency while debt repayments must be made in foreign currency.[16] When the dollar strengthens, that repayment burden grows heavier because the exchange rate moves against the borrower, especially for countries in the Global South.[17]

- Domestic fundamentals that reflect the local macroeconomic environment:
    - At the domestic level, macroeconomic fundamentals set the borrowing floor. High inflation forces central banks to maintain elevated interest rates, which raises the minimum rates at which any project can be financed.[18] Further, if a country runs a large current account deficit or public debt, it means that there is a dearth of financial resources to support investments in energy-related projects by the state.

Together, these layers compound to produce borrowing costs that can be significantly higher than those faced by developed economies.

Apart from roughly seven to 10 emerging markets (for example, China, India, Brazil, Indonesia, Mexico, Turkey and South Africa) who feature strong macroeconomic fundamentals and issue significant domestic debt in local currencies,[19] the domestic financial markets in many developing economies are also relatively underdeveloped. This forces greater reliance on international borrowing, which is more expensive and volatile.[20]

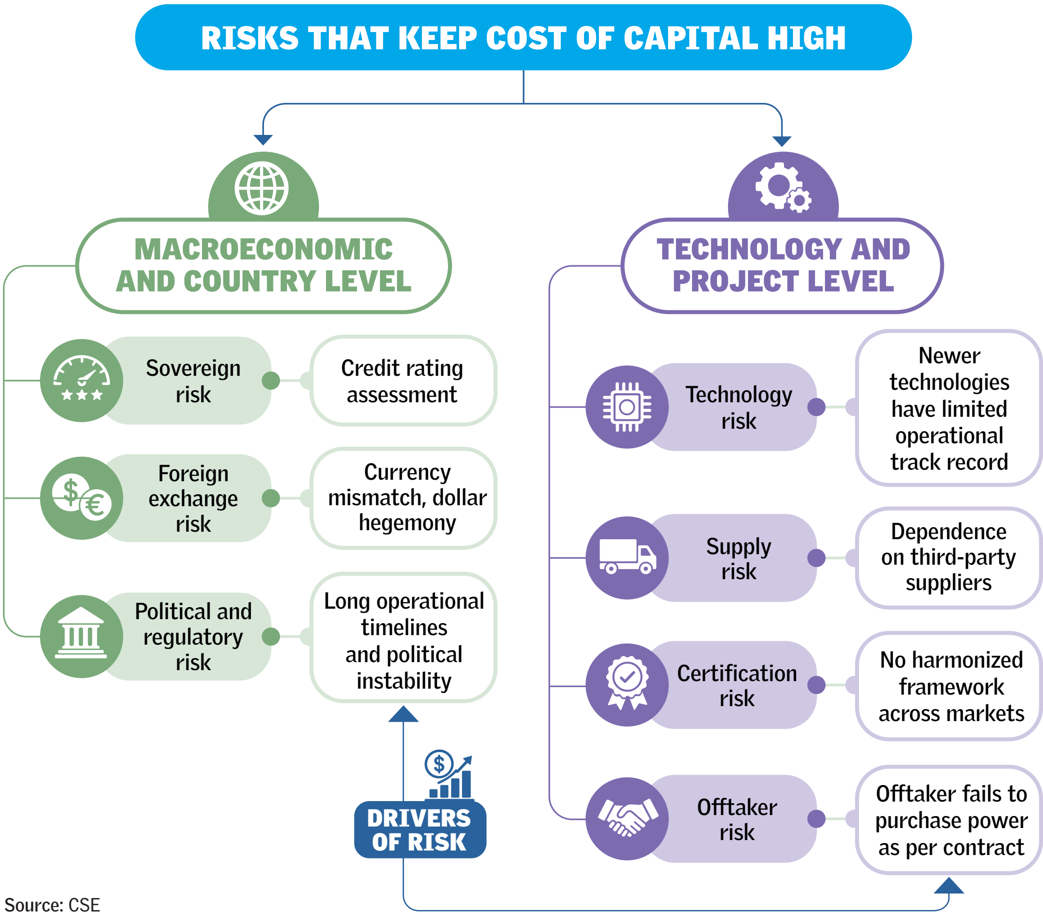
The interaction between global and domestic layers makes the cost-of-capital challenge in the Global South particularly complex. For renewable energy specifically, this becomes significant because clean energy projects are capital-intensive and require upfront investments, which means that financing costs, unlike in the case of fossil fuels, need to be hedged before a project is built.

As per experts interviewed by CSE, a lack of reliable and standardized data (information asymmetries) as well as lack of previous track record in renewables can also lead to overestimation of risk and inflated financing costs in developing countries. However, India provides an example of how state-led schemes that aim to address the viability funding gap to establish certain technologies such as offshore wind can help in gaining investor confidence if the projects commissioned are of a sufficient capacity (for instance, 1GW in the case of India).[21] Ultimately, higher perceived risks in any of these categories increase the cost of capital and can deter the investment needed to meet global climate goals.

2.4 What are the risks and who defines them?

Risks, real and perceived, strongly influence investment decisions. Emerging markets and developing economies (EMDEs) are perceived as high-risk investment regions and, as such, face higher cost of capital and relatively lower levels of investment in clean energy. Among EMDEs, India's cost of capital for grid-scale renewable energy is one of the lowest. However, it is still 80 per cent higher than

Figure 9: Breakdown of types of risks that keep cost of capital high



Source: CSE

in advanced economies.[22]

The international community has long acknowledged the need to address this risk perception. Even as recently as April 2026, the Spring Meetings of the World Bank and IMF saw several official communiques and civil society statements emphasizing the importance of challenging risk perceptions and addressing high capital cost barriers.

To ramp up investments, it is crucial to understand the risks associated with the cost of capital for green technologies in the Global South.[23,24]

These are present at various levels—country, sector, project, and technology.[25]

Macroeconomic and country-level risk

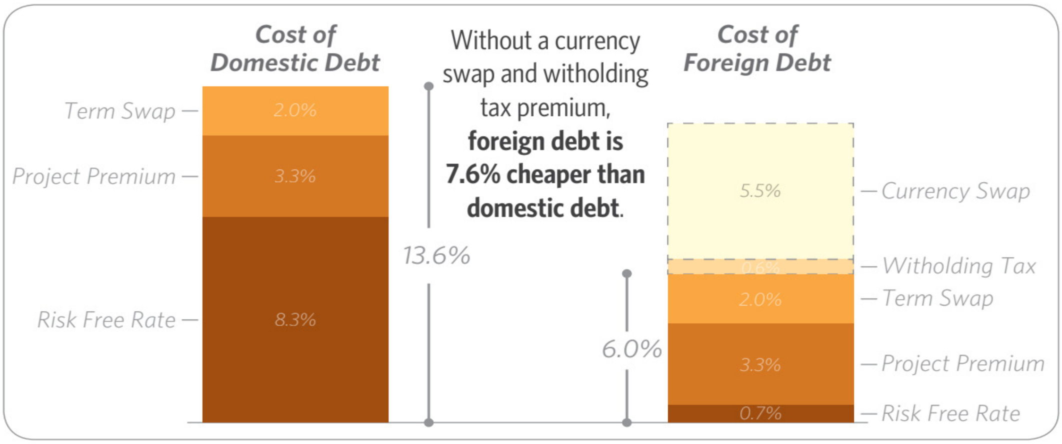
i. **Macroeconomic and country level (sovereign risk):** Countries act as implicit or explicit guarantors of investments made in the country, making sovereign borrowing conditions a useful proxy for assessing country risk. A well-established correlation exists between weaker sovereign credit ratings and higher risk premia, which translate directly into higher financing costs. These effects are particularly pronounced in developing countries, which are systematically assessed as higher risk due to 'macroeconomic volatility, weaker institutions, and constrained fiscal capacity'—all parameters considered to varying degrees by Credit Rating Agencies (primarily S&P, Moody's and Fitch) while carrying out assessments for ratings.

ii. **Foreign exchange risk:** Capital markets comprise institutions and mechanisms such as stock markets, bond markets, banks, and investment funds that facilitate long-term financing and investment—essentially, a segment of the financial system aimed at channelling the savings of an economy to those in need of capital. In jurisdictions with underdeveloped capital markets, access to long-term local currency required to finance green energy projects is limited. In such cases, borrowing in foreign currency, say the US dollar, becomes the predominant financing route. But when the revenues from the said energy project are earned in local currency while the capital for investment is sourced in hard currency (money from a politically 'stable' and economically strong country, considered the safest for worldwide transactions for goods and services), likely the dollar, any depreciation in local currency with respect to the dollar will wipe out returns.

Investors then price this exchange-rate uncertainty into the returns required from the project. This need for higher project returns, due to perceived local-currency depreciation, is eventually reflected in a higher cost of capital. To mitigate this risk, developers and lenders often use currency hedging instruments and swaps to transfer exchange-rate risk from the developer to other financial institutions or counterparties providing the hedging instrument, but this increases the overall project cost.[26] A study by CPI finds that in India, foreign debt for renewable energy may be approximately 7.6 per cent cheaper than domestic debt. However, when the cost of a hedging instrument such as a currency swap is accounted for to address currency risk, the overall cost of foreign debt rises by 5.5 per cent, effectively erasing much of the advantage of issuing foreign debt.[27]

Foreign exchange risk is typically defined by central and international banks, investors, lenders, etc., who assess exchange rate vulnerabilities. Options and swaps are widely used derivative instruments (a type of financial contract between two or more parties) for hedging foreign exchange risk. Options markets give an entity the right to buy or sell foreign currency on a specific date at a specific price. A foreign currency swap is a financial agreement in which two parties exchange principal and interest payments in different currencies to manage exchange rate risk or obtain more favourable loan terms.[28]

Figure 10: The impact of the currency hedge on the cost of foreign debt



Source: Climate Policy Initiative[29]

iii. **Political and regulatory risks:** Financial viability of a project is susceptible to changing laws and policies. The long operational lifetimes and extended payback periods that are characteristic of clean energy investments increases uncertainty for investors regarding the changes in government policies, fiscal incentives, and taxation regimes. Projects in countries with poor records of contract enforcement or frequent policy reversals have been seen to face higher risk premiums, even when underlying technologies are mature or become economically competitive. An apt example of regulatory risk hurting renewable energy (solar and wind) investments comes from Vietnam when the government considered retroactively altering promised feed-in tariffs.[30,31] This move faced backlash from investors, as scaling back on the feed-in tariffs would result in widespread losses for contracts with long-term pricing.

Another example is the delay of signing up to 27 Power Purchase Agreements (PPAs) by Eskom, South Africa's largest electricity producer (government owned). The country's Renewable Energy Independent Power Producer Procurement Programme was halted in 2015–18, with official sources citing overcapacity and pressure on the grid as reasons. However, critics have argued it resulted from an expanded appetite for coal and nuclear sources of power.

Eskom did not sign PPAs amounting to US $4.7 billion until more than two years after the planned timeline.[32] The delays, though eventually mitigated, generated significant investor concern regarding policy credibility and contractual certainty, with industry groups describing the episode as a 'massive blow to investor confidence' in South Africa's renewable energy sector.[33,34] An example of similar risks impacting a developed country is Spain (see *Box: The case of Spain: Retroactive solar subsidy reductions increase regulatory risk*).

THE CASE OF SPAIN: RETROACTIVE SOLAR SUBSIDY REDUCTIONS INCREASE REGULATORY RISK

An older but significant example is Spain, where retroactive reductions in solar feed-in tariffs after 2010 (following the 2008 financial crisis) undermined investor confidence and led to multiple international arbitration disputes involving renewable energy investors. Spain dramatically increased solar installation through government subsidies in 2008, but did not account for falling costs of solar PV projects, and attracted investors with an 'overgenerous' rate structure of the proposed feed-in tariff among other regulatory levers.[1]

Following fiscal distress caused by the 2008 financial crisis, coupled with falling solar PV costs, the country progressively slowed down deployment and reduced costs until a complete moratorium on support for solar PV by 2012–13. Key policy changes leading up to this were introduced in 2010, when the government reduced the cap on running hours eligible for feed-in tariffs (FITs) and reduced the lifetime of FIT payments to 25 years.[2] The solar PV sector considered these retroactive changes and grounds for legal disputes. As of 2024, the country remains embroiled in international energy claims against it, primarily for the retroactive policies that reversed guaranteed gains for energy companies and investors. Moreover, one study in 2022 found that the retroactive subsidy changes—including on feed-in tariffs—directly impacted investments in renewable energy. The investment rate for onshore wind as well as solar PV decreased by approximately 16 per cent and 45 per cent, respectively, following the policy 'flip-flop'.[3]

Sources:

1. Pablo del Rio and Pere Mir-Artigues. 2014. A Cautionary Tale: Spain's Solar PV Investment Bubble. International Institute of Sustainable Development. Available at https://www.iisd.org/sites/default/files/gsi/rens_ct_spain.pdf

2. Arbitration Monitor. 2025. Spain's Renewable Energy Reckoning: A Case Study in Non-Compliance with Investment Treaty Awards. Available at https://arbitrationmonitor.com/spains-renewable-energy-reckoning-a-case-study-in-non-compliance-with-investment-treaty-awards/

3. Lars H. Sendstad, Verena Hagspiel, Wilhelm Jebsen Mikkelsen, Ruben Ravndal, Martin Tveitstøl. 2022. The impact of subsidy retraction on European renewable energy investments, Energy Policy, Volume 160,112675, ISSN 0301-4215. Available at

https://doi.org/10.1016/j.enpol.2021.112675.

Political risks are incorporated into sovereign ratings by credit rating agencies and other investment risk indices. These agencies draw on evaluations by political risk analysts, such as MIGA (World Bank Group), political risk insurers, and Oxford Analytica, among others. These evaluations consider political stability, continuity, and institutional strength, among other factors.

Technology, project and sector-level risk:

i. **Technology risk:** This risk varies with how mature the technology is, and whether historical performance data of said technology is available for validation. Investors rely on proven operational track records to forecast future revenues. In newer and evolving technologies, such data can be limited or unreliable, increasing perceived risk of those technologies. Therefore, early deployment phases contribute to elevated financing costs for clean technologies.

   Firms assess technology risk through due diligence and technology certifiers, who may evaluate the performance data from pilot projects to assess operationality and the technology's track record. These assessments are then included in ratings by private organizations such as DNV (Det Norske Veritas), UL Solutions and agencies such as IRENA, which analyse project-level risk and ratings.

ii. **Supply risk**: Supply risk arises from uncertainty regarding the availability and reliability of key inputs and equipment required for energy production. These inputs—fuel, components, or grid access—vary across technologies, so developers often depend on third-party suppliers or utilities for them. Reliance on a third-party creates exposure to risks related to contract pricing, volumes, and duration. Supply insecurity thus increases the risk premium demanded by investors. Supply risk is evaluated by advisors and analysts which is accounted for by project lenders. A recent example of supply risks impacting clean energy financing, and therefore deployment in India, is the delays in grid access for renewable energy projects caused by the global transformers supply crunch in 2024. Projects in Gujarat and Rajasthan faced delays in transmission-line connectivity due to the global supply crunch. The Government of India mandates transformers with at least 60 per cent domestic value addition, further exposing developers to supply risks. The demand for High Voltage Direct Current (HVDC) transformers, which enable efficient bulk evacuation of energy from clean sources for long distance distribution, is increasing across the globe. Delays in supply have caused delays in bringing projects online, underscoring the role that supply risks cause in increasing the risk premium demanded by developers.[35] This supply shortage is expected to continue for several years globally, impacting even developed countries such as the United States and the UK.[36]

iii. **Certification risk:** Certification risk arises from the absence of harmonized certification frameworks, creating uncertainty, particularly for projects intending to export energy to jurisdictions with stringent environmental regulations or carbon border adjustment mechanisms. This is becoming increasingly relevant for EMDEs. Project developers who fail to comply with national and international standards for emissions intensity and sustainability face additional revenue uncertainty, thereby raising project financing costs. While technical and management standards are set by bodies such as the International Organization for Standardization (ISO), carbon credit certification and verification are governed by standards such as Verra and Gold Standard, which are relevant where project revenues depend on verified emissions reductions. Project investors may use them to evaluate compliance and risk.

iv. **Offtake or demand risk:** An 'offtaker' is an entity, such as a buyer or a utility company that agrees to purchase energy from a generator. When there is a risk that the offtaker might fail to purchase the energy as mandated by the contract, this creates offtake risk. Offtake or demand risk is influenced by the project's expected cash flows and depends heavily on the ability to secure a buyer for the generated energy as well as on the likelihood of delayed or incomplete payment. It is also influenced by inflation, which may affect future energy prices and therefore long-term revenues. Power purchase agreements (PPAs) can mitigate offtake risk by providing contractual revenue certainty, but challenges persist.

A CEEW study has highlighted that DISCOMs, which are the primary off-takers of renewable power in India, routinely delay payments by an average of 11 months, while the contractual requirement is around 30–60 days.[37] This serious delay impacts project liquidity, weakens debt servicing capacity and increases the overall perception of risk. Offtake risk is assessed by analysts and credit rating agencies and is taken into account by investors when making investment decisions.

3

THE GLOBAL SOUTH AND STRUCTURAL BIAS

- **The high cost of capital in many developing countries is driven more by perceived risk than actual project performance.**
- **Sovereign credit ratings often rely more on a country's income level than its actual ability to repay debt.**
- **Structural features of the global system compound this bias, keeping the cost of capital disproportionately higher for developing countries.**

3.1 Is the high cost of capital in the Global South actually justified by risk?

Cost of capital is structurally higher in the Global South, and different categories of risk drive this elevation. Real risk is determined by factors such as defaults, missed loan repayment instalments, currency fluctuations, and an inability to service debt. Perceived risks entail making investment decisions on the basis of factors such as assumptions that certain countries' political outlook is inherently unstable, such as a generalized 'Africa risk' narrative for many African countries, higher risk weights in global banking regulations (Basel III), lower ratings despite sound repayment records, and investors pricing uncertainty beyond observed default data (see *Box: Unfair 'African risk' narrative penalizes economies trying to transition*). The question is: are these risks real, or are they (in part) a product of how the global financial system perceives and prices them?

UNFAIR 'AFRICAN RISK' NARRATIVE PENALIZES ECONOMIES TRYING TO TRANSITION

Misconceptions regarding credit risk in Africa result in an estimated US $75 billion in annual excess borrowing costs, a phenomenon often termed the 'prejudice premium'. Evidence shows that African nations perform on par with similarly rated global peers; for example, World Bank data during 2010–20 reveals that African infrastructure loans had the second-lowest default rate globally.[1] Despite this performance, African countries have to pay higher interest rates compared to countries from other regions to borrow money on global markets. As highlighted by the UNDP Africa Credit Ratings Resource Platform, interest costs for African countries average 11.6 per cent, which is 8.5 percentage points higher than the US Benchmark. Additionally, between 2004 and 2021, Sub-Saharan Africa paid 2.1 per cent more in coupons than other regions.[2] A stark comparison shows that bond-holders earn approximately 9.8 per cent on African debt versus only 6.5 per cent for Latin American bonds, despite African infrastructure returns being six times higher than the S&P 500 over the last three decades.[3]

Only four of the 32 rated countries in Africa possess investment grade ratings as of end 2025, namely, Botswana, Morocco, Mauritius and St Helena.[4] The African Union (AU) decided to form its own African Credit Rating Agency (AfCRA) to counterbalance the bias of global agencies and challenge the 'prejudice premium' that costs the continent billions each year. However, the success of such an effort depends on various factors, including acceptability, i.e. to what extent global investors actually legitimize the ratings when issued; legal obligations of firms in certain countries (such as USA) to only consider ratings by the big three, and, lastly, the lack of funds for initializing operations.[5]

Sources:

1. *Editorial Staff. 2025. Bias Costs Africa $75 Billion a Year. Africa Briefing. Available at https://africabriefing.com/bias-costs-africa-75bn-year/#google_vignette*
2 United Nations Development Programme (UNDP). 2024. *Africa Credit Ratings Resource Platform*. United Nations Development Programme (UNDP). Available at https://www.undp.org/africa/credit-ratings-resource-platform
3 *Editorial Staff. 2025. Bias Costs Africa $75 Billion a Year. Africa Briefing. Available at https://africabriefing.com/bias-costs-africa-75bn-year/#google_vignette*
4 United Nations Office for South-South Cooperation (UNOSSC). 2026. *Strengthening Sovereign Credit Rating Capacity: UNDP Consultations Aim to Lower Africa's Cost of Capital*. United Nations Office for South-South Cooperation (UNOSSC). Available at https://unsouthsouth.org/2026/02/27/strengthening-sovereign-credit-rating-capacity-undp-consultations-aim-to-lower-africas-cost-of-capital/
5 Bodo Ellmers. 2025. *The Price of Money: High Capital Costs as an Obstacle to Development. Global Policy Forum Europe*. Available at *https://www.globalpolicy.org/en/publication/price-money*

3.2 If it's not 'real' risk alone, what are credit ratings actually measuring (or not measuring)?

Sovereign risk forms the foundation against which a country's investments are analysed. It is based on global risk assessments. These assessments are largely produced by a small set of stakeholders such as global credit rating agencies (CRAs), major institutional investors, and international regulatory frameworks, whose methodologies have been critiqued for bias and lack of transparency.

- In a comprehensive study of cost of capital in emerging markets and developing economies (EMDEs), the Columbia Center on Sustainable Investment (CCSI) examines which macroeconomic indicators most strongly influence sovereign credit ratings and its implications for climate finance flows.[38] It finds that GDP per capita, an indicator of per capita income rather than an indicator of creditworthiness, directly determines a country's sovereign credit score. An IMF paper detailing the ratings methodologies of the Big Three ascribes the use of this indicator as a 'comprehensive proxy for the level of development of the economy as a whole and, thence, for its resilience to political and economic shocks'.[39] However, as the Columbia study points out through regression analysis of a set of ratings for Moody's, in practice this means that higher-income countries have good credit ratings, and low-income countries are rated lower, often irrespective of country-specific credit risks.
- The debt-to-GDP ratio signifies a country's debt servicing capacity, but it was not found to be statistically significant to the country's sovereign credit score in the paper by CCSI. Many developed countries awarded a AAA rating had a debt-to-GDP ratio exceeding 100 per cent, while developing countries with a much lower debt-to-GDP ratio were rated worse. Countries with access to Federal Reserve 'swap lines'[40] that developed countries typically enjoy also have higher ratings. Countries with high inflation, on the other hand, were found to have lower ratings.

Table 1: The bias of CRAs against developing countries in numbers

Country	Status	S&P Credit Rating	Growth rates for 2026 (in %)	Debt to GDP ratio in 2024 (in %)
India	Developing	BBB	6.5	81.2
Italy	Developed	BBB+	0.5	135.3
Spain	Developed	A+	2.1	101.6

Source: IMF - growth rates: https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD

Public debt as percentage of GDP: https://www.imf.org/external/datamapper/d@FPP/FRA/JPN/GBR/SWE/ESP/ITA/ZAF/IND

Table 1 points to the inherent bias against developing countries such as India, who continue to be impacted despite strong macroeconomic fundamentals. Italy and Spain with weaker growth and higher public debt levels, continue to receive better ratings[41,42] while India's rating was static, and at lowest investment grade for more than 18 years before being changed in 2025.[43]

- The disclosure on weightage of different parameters or methodologies is not made publicly available. This lack of transparency may allow room for biases to precipitate. CSE's 2023 paper, *Beyond Climate Finance* highlights similar concerns where data driven results are combined with discretionary judgements in assessing sovereign ratings.[44]
- Credit ratings have a crucial role in determining the cost of capital and therefore deciding how much and what kind of capital flows in EMDEs for energy transition. The sovereign 'ceiling' lite effect highlights that a country's credit rating effectively caps the risk assessment for individual projects, treating low-income nations as inherently riskier regardless of individual project attributes.[45] Even if project level indicators such as PPAs and payment security mechanisms are strong with predictable revenue streams, EMDEs will face a higher cost of capital due to their sovereign risk indicators. This effect can become cyclic, essentially creating a trap where countries with historically lower ratings pay a higher cost of capital because they are rated as riskier, even when project fundamentals and macroeconomic

CRAs PENALIZE DEVELOPING COUNTRIES FOR THEIR CLIMATE VULNERABILITY

A 2026 publication titled *Dancing to Their Tune: Credit Rating Agencies, Sovereign Risk, and Financing Conditions in the Global South*[1] highlights two examples of developing countries being penalized for climate vulnerability. First, the case of the Maldives: the small island nation, highly vulnerable to climate impacts, with an economy highly dependent on tourism, saw its credit rating downgraded after rising sea levels and recent flooding, as well as the COVID19 pandemic. Credit rating agencies have specifically used its high climate risk to justify these lower scores, which has pushed borrowing costs to very high levels (9–12 per cent), the paper notes.

Secondly, the case of Pakistan is highlighted. Following catastrophic flooding in 2022 (regarded as worsened by climate change by scientists of the World Weather Attribution), the country saw 33 million people displaced, along with severe infrastructure devastation. The country's ability to repay existing debts took a hit as well, forcing it to impose austerity under an IMF bailout loan, delaying investment in social spending, including climate resilience. Moreover, rating agencies included the climate risk in their evaluations, with Fitch explicitly citing climate-related floods as an important factor undermining external liquidity and fiscal health, driving lower ratings. Despite some progress, the country remains caught in a cycle of climate risks reinforcing negative ratings, which in turn exacerbate growth and slow sustainable development.[2]

Sources:

1. Bhumika Muchhala, Patricia Miranda, Maria Syed, Jorge Luna. 2026. *Dancing to Their Tune: Credit Rating Agencies, Sovereign Risk, and Financing Conditions in the Global South.* LATINDADD. Available at https://latindadd.org/wp-content/uploads/2026/03/CRAs-summary2.pdf
2. Ibid.

indicators improve, reinforcing a self-fulfilling perception that distorts capital allocation and undermines equitable access to finance for climate action (see *Box: CRAs penalize developing countries for their climate vulnerability!*).[46]

Such critiques emphasize that sovereign ratings can lag economic reality and are shaped by criteria that inflate perceived risk beyond what project fundamentals alone would warrant.

3.3 What other structural forces are at play?

3.3.1 Dollar hegemony and foreign exchange risk

The long-standing dollar hegemony (structural dominance of the United States dollar in the global financial system) often stands in the way of developing countries in accessing crucial finance for clean technologies necessary to mitigate climate risks (see *Box: Dollar dominance*).

Dollar dominance

The United States dollar acts as the 'reserve currency' for the global financial system. A reserve currency is held by central banks and financial institutions in large quantities to facilitate international trade, investment, and debt payments. Since much of global borrowing and commodity trade is denominated in dollars, countries and firms across the world depend heavily on access to dollar liquidity. This central role of the dollar in global trade and finance gives the United States disproportionate influence over international financial systems. The structural dominance of the US dollar is often referred to as 'dollar hegemony'.

Numerous projects in Kenya and Senegal, for example, are dollar- or euro-denominated despite revenues being in local currency. In Senegal, projects earn revenue in CFA francs but are often financed in euros. This creates currency risk, where a mismatch between the dollar and local currency could expose developers and lenders to exchange rate shocks. The Kenyan shilling's depreciation against the US dollar between 2018 and 2024 raised financing risk perceptions, contributing to higher projected WACCs.[47] These currency risks are real, but only due to the design of the present global financial system, which is tipped against countries that do not hold large US$/euro reserves, and are exposed to currency volatility without any choice.

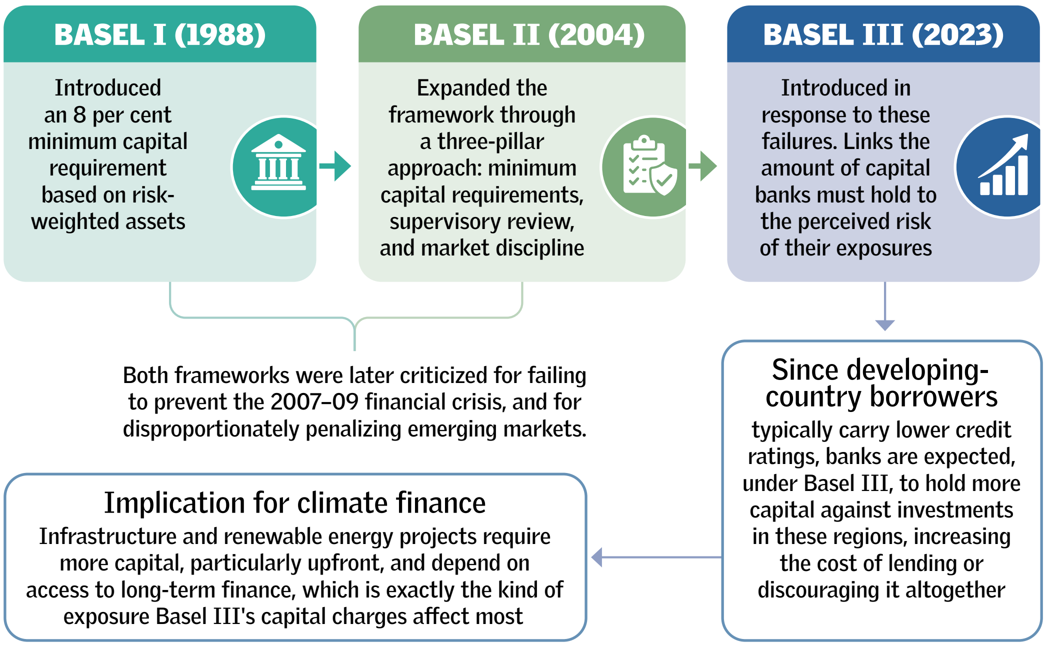
Financial markets refer to systems and institutions that facilitate the borrowing, lending, and trading of financial assets; deep financial markets are characterized by high liquidity, broad investor participation, and easy access to diverse sources of finance. Capital markets refer to those segments of financial markets where long-term financial securities, such as stocks and bonds, are issued and traded to raise investment capital. Mitigating forex risks points to the inability of developers to access deep financial markets as well as the poor growth of capital markets in developing countries.

But it also points to the structural global dollar hegemony, where most international finance is in hard currency rather than domestically denominated, and developers resort to such dollar-denominated borrowing as a last resort—further amplifying perceived risk premia, and keeping costs of clean energy finance for EMDEs high.

3.3.2 Banking regulations impact climate finance for developing countries

The Bank for International Settlements (BIS) is an international financial institution owned by 63 central banks, representing around 95 per cent of global GDP, and acts as a 'bank to central banks'. It supports monetary and financial stability and develops global regulatory and supervisory standards. Among these are the capital adequacy frameworks developed by the Basel Committee on Banking Supervision, under the BIS. Capital adequacy requirements determine the minimum capital banks must hold to absorb potential losses and remain financially stable. The Basel Accords form the core international framework for these requirements.

Figure 11: The evolution of the Basel Accords



Source: CSE analysis, Brookings,[48] Investopedia [49]

Experts have argued that by embedding sovereign risk assessments into prudential (banking) regulation, the 'reformed' Basel III reinforced structural disadvantages for financing the energy transition in developing countries, and reduced private investment potential. It is also well noted that constrained finance for climate/energy transition is an 'unintended consequence' of the accord that otherwise made improvements in maintaining global financial stability (see *Box: India attempts to resolve unintended consequences of global banking regulations*).[50]

INDIA ATTEMPTS TO RESOLVE UNINTENDED CONSEQUENCES OF GLOBAL BANKING REGULATIONS

The Reserve Bank of India (RBI) attempted to address the accord's impacts by utilizing certain flexibilities within the Basel III regulations. In essence, the RBI has proposed that banks consider climate-related risks when assessing loans, allowing projects with greater exposure to physical or transition risks to attract higher capital requirements. At the same time, it has reduced the risk weight for operational infrastructure projects from 130 per cent to 80 per cent, while maintaining higher requirements during the construction phase, when projects are inherently riskier.[1] Because lower risk weights mean banks need to hold less capital against these loans, lending costs fall, making it easier to finance long-term infrastructure, including renewable energy projects. By better aligning capital requirements with the actual risk profile of infrastructure investments, the RBI aims to preserve financial stability while improving the flow of finance to sectors critical for India's low-carbon transition.

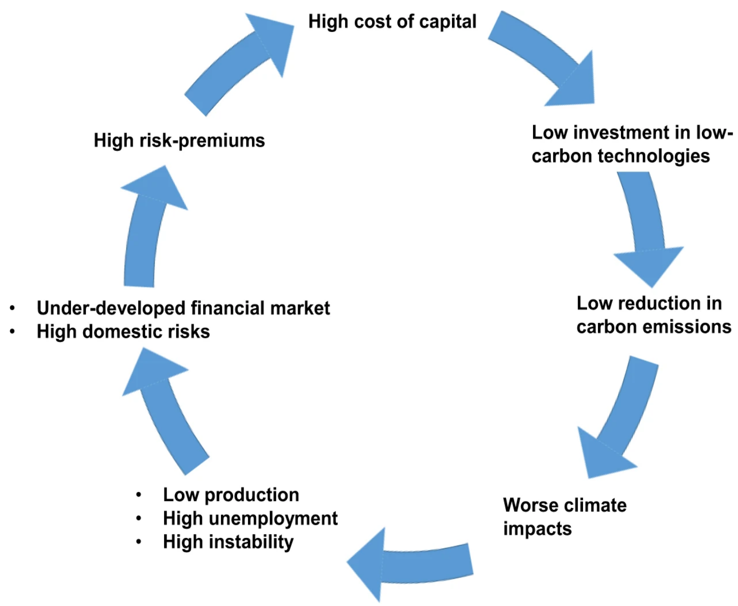
Source:
1. Joseph Feyertag, Arunima Sharan and Agnieszka Smolenska. 2026. *Is India Setting the New Standard for Basel III Supervision?* CETEx. Available at https://cetex.org/news/is-india-setting-the-new-standard-for-basel-iii-supervision/

Investec, a South African banking and wealth management company, highlights these fallouts and has called for changes to the implementation of Basel III, arguing that the framework disproportionately affects banks in emerging markets. According to Investec, African banks already face higher funding costs and operate in countries with lower sovereign credit ratings, meaning they must hold more regulatory capital against their assets than banks in advanced economies. This reduces banks' capacity to lend and increases the cost of credit, particularly for long-term investments such as infrastructure and renewable energy. Investec adds that global prudential rules should be better calibrated to account for the structural realities of emerging markets to allow for more investment in energy transition and broader economic development for countries in Africa.

3.4 What happens when climate vulnerability is an added layer?

Even with strong project fundamentals (such as abundant renewable resources, mature/proven technologies, predictable long-term revenue), when high and persistent perceptions of sovereign, currency, and macroeconomic risk keep the cost of capital for clean technologies and energy high, they slow the pace of renewable energy deployment, which is crucial to mitigating climate change. This situation, in turn, exacerbates the ‘climate investment trap’ in developing economies.[51] When risk perceptions remain high, they produce the need for higher returns to justify investment, i.e., cost of capital. A high cost of capital leads to lower investment, validating the original perception of the risk. This creates a vicious cycle that undermines crucial investment to combat climate change in the regions where it is needed the most.

Figure 12: The climate investment trap at the macroeconomic level



Source: Nadia Ameli et al. 2021

4

WHAT DOES THE EVIDENCE FROM INDIA SAY ABOUT THE COST OF CAPITAL?

- Despite being a global leader in renewable energy, India—even with strong economic growth and policies—still faces much higher financing costs than many developed countries.
- Insights from our primary survey reveal that the risk of payment delays or default by electricity distribution companies in India is a primary factor elevating the cost of capital.
- Government-backed payment guarantees and concessional loans were rated as the most effective, but structural asymmetries at the global level keep the cost of capital high.

Having established the factors driving poor credit ratings, and the significance of such ratings for climate finance for the Global South, this section focuses on India. The subnational clean energy financing ecosystem is changing rapidly. The government's ambition for 500 GW of non-fossil capacity by 2030 and the target to achieve 60 per cent of cumulative installed electricity capacity from non-fossil sources by 2035 in its third Nationally Determined Contribution (NDC) set policy direction for the inflow of domestic and international investments.

India has a rapidly maturing solar market supported by a dedicated financing institution for renewables through the Indian Renewable Energy Development Agency Limited (IREDA) and the Solar Energy Corporation of India (SECI). Between 2012 and 2020, the cost of financing a solar project in India fell by roughly 3–4 percentage points. This happened because as more solar projects were built successfully, lenders became more comfortable with the technology and the policy environment. This further helped the market become more mature.[52]

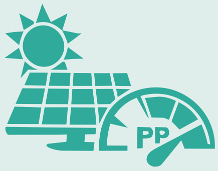
Yet India's cost of capital in India remains higher than in advanced economies. For instance, despite having the lowest debt-to-GDP ratio among its EMDE peers, and among the fastest growth rates, India pays significantly higher borrowing costs—roughly 300–640 basis points more than countries like Italy, France, or Japan.[53] This tends to impact viability of projects in a significant way.

Thus, India offers an instructive case study to examine how the above-mentioned risks influence financing decisions, and the factors that impact the cost of financing for clean energy projects.

4.1 Financing a utility-scale solar PV project in India

The rapid deployment of solar PVs and maturation of such a technology in the Indian market is also a story of how the projects continue to be financed. Financing a utility-scale solar project in India is a phased process, with each phase carrying distinct regulatory requirements, capital structures, and risk exposures. *Figure 13* maps this journey from initial concept to operation, with an indicative assessment of how sensitive the decision-making is at each stage to the cost of capital.

Figure 13: How is a utility-scale solar power project typically financed in India?

	PHASE 1 CONCEPT AND PRE-FEASIBILITY	PHASE 2 OFFTAKE, BIDDING AND PROCUREMENT
ADMINISTRATIVE/ REGULATORY LAYER	• Identify potential sites and conduct high-level land use/ zoning assessment: pre-feasibility and feasibility studies • Initial grid connection assessment offtake route: Will the project sell through SECI/ NTPC/state DISCOM or any other route? • Assessments/studies such as initial Bankable Energy Yield prediction; EIA or other environmental/social concern reports; DPR etc.	• Request for Selection Issuance (RfS): Initiation of competitive bidding process for procurement of electricity from generators. • Technical evaluation: Eligibility based on technical criteria and MNRE's Approved List of Models and Manufacturers (ALMM) • Financial bid and e-Reverse auction: After primary e-bidding identifies the initial lowest possible tariff, the shortlisted bidders enter an online reverse auction, where the lowest possible tariff acts as the benchmark and bidders compete by quoting lower tariffs.
FINANCING LAYER	• Funding source: Equity from a developer/sponsor or early-stage investor capital. Equity typically covers studies before the second or third stage, as debt comes into the picture once basic bankability is established. 	• Equity • Bank/Special Purpose Vehicle (SPV) • Bid Bond: Requirement for a 'bid guarantee' to be provided by bidders, which will be forfeited if PPA is not successfully executed • Qualification: Bidders must meet a financial qualification threshold, typically to be at least 20 per cent of estimated project cost or other specified in RfS • Successful bidder receives Letter of Award/Letter of Intent, then proceeds toward PPA signing (and PSA where applicable) and financial close.
COST OF CAPITAL SENSITIVITY	**LOW** At this stage, expenditure is relatively low; the primary focus is on risk identification and whether the project can become bankable. Assumptions about tariff, offtaker risk, grid access, and future debt terms influence whether the project proceeds.	**MODERATE TO CRITICAL** Since the awarded tariff usually forms the basis of a long-term PPA—25 years—during the auction, the developer's assumptions on future debt costs must be precise to remain viable. 

Source: CSE analysis

PHASE 3
DEVELOPMENT AND FINANCIAL CLOSE

- PPA signing: Finalizing the 25-year contract with the offtaker
- Due diligence: Comprehensive review of technical, legal and insurance bankability

- Performance guarantee: A submission by the bank which is a minimum 5 per cent of project cost
- Structure: Standard Indian debt-equity split of 75:25 with roughly 15-year debt tenures
- Layering: Example, accessing soft loans from IREDA to lower interest rates below 5 per cent for eligible projects

DIRECTLY AFFECTED

The interest rate, tenor, and DSCR (Debt Service Coverage Ratio) and finance fundamentals are locked in here.

PHASE 4
CONSTRUCTION AND COMMISSIONING

- Adherence to performance standards depending on the nature of funding source, example: IFC Performance Standards for environmental and social compliance
- Grid synchronization and final commissioning certificates

- Disbursement: Milestone-based access to funds instead of lump sum (stage-wise debt draw-downs, e.g., 40–60 per cent upon equipment delivery)
- Interest during construction (IDC): IDC represents the interest a developer must pay on loans while the plant is being built but before it has begun generating revenue to cover those costs.

HIGH

During construction, solar projects are very sensitive to borrowing costs, because delays in commissioning lead to cost overruns (IDC escalation) and payment of penalty for delays.

PHASE 5
OPERATION AND REFINANCING

- PPA/PSA compliance (selling the power); regulatory compliance

- Monitoring Performance Ratio of the plant as per PPA/EPC warranties.

- Refinancing: Once de-risked, moving debt from NBFCs to Commercial Banks or Global Bond Markets to lower the cost of capital (or in infra lenders like IIFCL)

MODERATE TO LOW

The project is now an 'operating asset'; lower risk profiles allow for significantly lower interest rates than during construction; forfeiture of guarantees possible.

4.2 What do investors and policymakers say? Insights from India survey

Here we synthesize insights from a detailed survey of 14 respondents across India's renewable energy (RE) financing ecosystem. Respondents were primarily drawn from non-banking financial companies (NBFCs), with half of them working on rooftop/distributed solar and one-fourth on utility-scale solar, and the rest working on technologies such as onshore wind and hybrid technologies. It is also important to note that not every respondent answered every question, thus there is a difference in sample size across findings.

The findings are organized across three themes:
1. Risk perceptions;
2. Translation of risk into financing terms; and
3. Effectiveness of interventions.

4.2.1 Risk perceptions

Offtaker payment risk is the top-ranked concern for financiers, followed by resource variability and construction risk (see *Table 2*). Policy and regulatory uncertainty also ranks high.

Table 2: Risks that impact the viability of a project

Risk	Score
Offtaker payment risk	3.9
Resource risk	3.5
Construction risk	3.5
Policy/regulatory change risk	3.5
Land acquisition/permitting risk	3.2
Grid curtailment risk	3.3
Refinancing risk	3.0
FX risk	2.1

Source: CSE analysis

Note: See the glossary in the annexure for a glossary of what these risks mean.

- Foreign exchange risk ranks notably low. Most respondents finance projects through domestic capital markets and have limited exposure to external borrowing, pointing to the relative strength of India's domestic market compared to other developing countries where this can be a barrier. For instance, in July 2022, ReNew Energy Global became the first Indian renewable IPP to refinance its dollar-denominated bonds, replacing US $525 million in

USD debt with domestic project debt, citing lower cost of capital and greater flexibility.[54]

- Risk perceptions are shaped less by current project fundamentals than by three factors, ranked highest to lowest (see *Annexure Fig. A2*)
  - › Past policy reversals;
  - › Early-stage market failures, including payment delays and contract renegotiation; and
  - › Credit committee conservatism.
- As a result, lending behaviour continues to be shaped by these past and present factors even as project fundamentals, such as abundant renewable resources, mature technology, and predictable long-term revenue, keep improving.

4.2.2 Translation of risk into financing terms

Risk shows up in financing agreements as higher interest rates and additional collateral requirements, not deal rejection (see *Annexure Fig. A3*).

- Project finance is the near-universal mode of financing clean energy projects in India, used far more than balance sheet or intermediary-based finance (see *Annexure Table A1*).
- The duration of time over which loans can be repaid is more prominent in the six- to 10- year bracket but ranges widely, from under five years to over 20 years, with no clear pattern by project type (see *Annexure Table A2*).
- Interest rates for most respondents fall between less than 10 per cent and 10–13 per cent (see *Annexure Table A3*). According to one expert interviewed, such a range could hide the distribution of financing costs across residential rooftop solar financing, where costs have fallen sharply due to the PM-SURYAGHAR subsidy scheme, while the commercial and industrial segments have seen no equivalent.
- Lenders weigh a developer's financial strength and track record more heavily than the technology being deployed, scoring 3.86 out of 5 on a scale where 5 means financing costs are driven entirely by the developer's reputation (see *Annexure Fig. A4*). CRISIL's own ratings criteria confirm this, placing track record and cash flow discipline ahead of technology assessment once a project is operational.[55]

4.2.3 Effectiveness of interventions

Government-backed offtaker guarantees and concessional loans are rated the most effective tools for reducing the cost of capital, closely followed by standardized PPAs. Political risk insurance is seen as having minimal impact (see *Table 3*).

- Two interventions look effective in theory but under-deliver in practice
  - › **Partial credit guarantees** often look effective in theory but can raise

Table 3: Most effective interventions in reducing cost of capital

Interventions	Score
Government-backed offtaker guarantees	4.2
Concessional loans	4.0
Standardized PPAs	3.9
Policy credibility and governance	3.6
Partial credit guarantees	3.2
Currency hedging facilities	2.7
Political risk insurance	2.3

Source: CSE analysis

Note: A glossary of what these risks mean have been given in the annexure

financing costs in practice due to implementation bottlenecks. Such schemes are well-intentioned but particularly complex and difficult to realize.

› **Political risk insurance** in domestic contracts does not make much difference. Also, the legal system covers contract sanctity, so political risk may not be relevant.

- Interventions designed to reform sector-wide risk pricing have the highest impact rating as compared to measures aimed to improve financing for a group of projects or those that simply facilitate individual projects only (see *Annexure Fig. A5*).
- Almost 40 per cent of respondents point to regulatory reform as the government's foremost responsibility in lowering the cost of capital, ahead of market creation for clean energy technologies. Support for a dedicated green finance institution is also gaining traction (see *Annexure Fig. A6*).

4.2.4 Survey summary: What does the Indian evidence tell us?

The survey finding that offtaker payment risk is the leading concern for financiers is consistent with evidence gathered through expert interviews conducted for this study. For instance, in 2025, more than 40 GW[56] of centrally tendered renewable energy projects had no confirmed buyer for their power, and even a signed 25-year power purchase agreement remains at risk until the tariff is formally approved by state regulators.

This pattern also helps explain why government-backed offtaker guarantees and concessional loans, rather than partial credit guarantees, were rated the most effective interventions. Interviewees explained that India has moved away from partial credit guarantees at utility scale, relying instead on payment security mechanisms, such as letters of credit and tripartite agreements involving a central nodal agency, to manage risk. This distinction becomes significant because the main problem in India is delayed payment by distribution companies, not outright default, and credit guarantees are designed to cover default rather than delay.

Additionally, tenders backed by central agencies were reported to have a lower risk profile than similar state-backed agencies, offering a clear sense of how much a credible counterparty is worth to lenders. A key point is that newer tender formats introduce risks the current survey framework does not yet capture. For instance, round-the-clock (RTC) and firm dispatchable renewable energy tenders (advanced SECI procurement mechanisms, used to supply continuous green power) require developers to build extra capacity and sell the surplus on power exchanges, exposing them to external price and volume risks.

Considering the survey findings as a whole and the interventions ranked by respondents, the emphasis is on de-risking strategies in India, which are primarily geared towards addressing payment delays by distribution companies. As a result, government-backed offtaker guarantees and concessional loans score the highest.

However, such interventions also become a limitation as procurement structures diversify and newer technologies enter the mix. Even where these tools may work effectively, they operate at the level of individual projects and cannot address the sovereign-level constraints that experts also flagged. Therefore, addressing the latter requires engaging with the architecture of international finance itself, which is mapped in Section 4.

5 THE LIMITS OF DE-RISKING IN AN UNEQUAL FINANCIAL ARCHITECTURE

- Solutions are categorized into three levels: project and market interventions; domestic financial system and institutional reform; and international financial architecture reform.
- Project-level de-risking tools such as guarantees and concessional loans can make individual projects bankable, but cannot lower the sovereign borrowing floor.
- Structural reform agendas such as the Bridgetown Initiative and credit rating agency reform target the root causes, but do not yet have widespread buy-in.

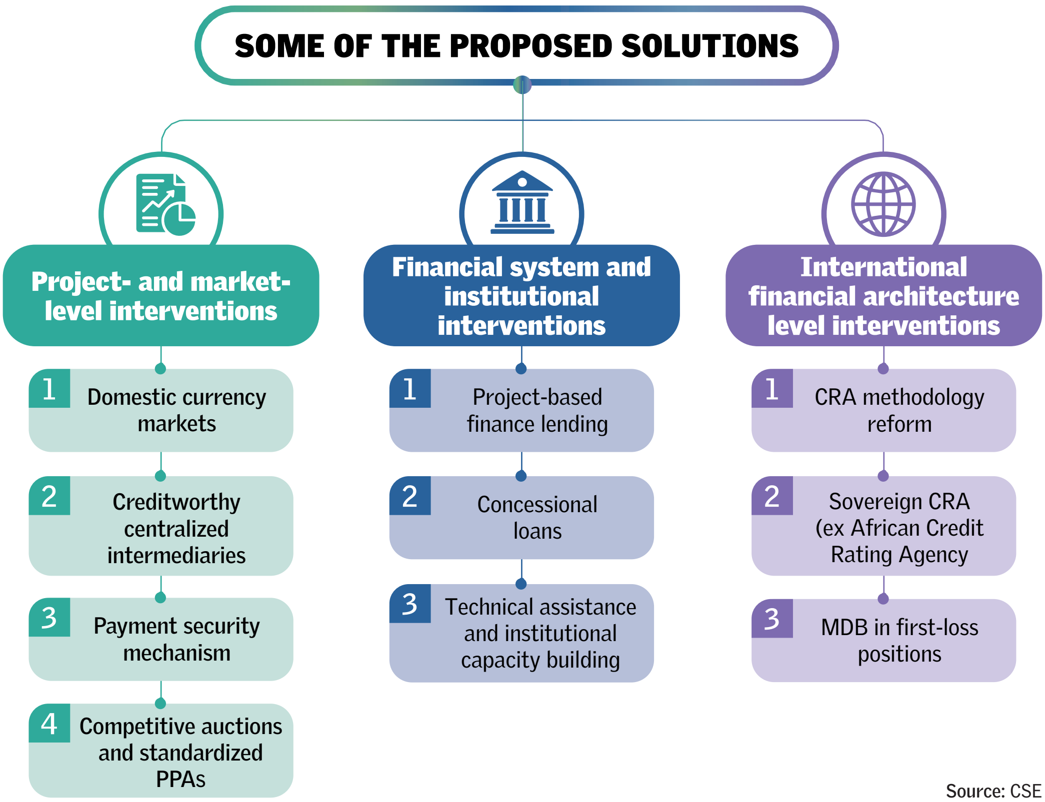
The earlier sections argue that a significant share of the higher cost of capital in the Global South comes not from weaker project fundamentals but from how the international financial system prices structural disadvantage as risk. This matters directly for what kind of solutions can work. Tools that operate at the level of individual projects can improve how a specific deal looks to an investor, but they cannot, on their own, move the sovereign ceiling, the dollar's dominance in global lending, or the credit rating methodology that sets the borrowing floor for an entire country.

The rest of this section maps the solutions currently on the table against that distinction and asks how much of the cost-of-capital problem each one can actually solve.

5.1 The proposed solutions on the table

Here, we map the full landscape of solutions by different levels. For instance, in EMDEs, sector-specific and project-level elements are estimated to account for roughly 20–30 per cent of the higher cost of capital.[57]

Figure 14: Proposed solutions across levels to reduce the cost of capital



Source: CSE

Thus, the following solutions in Table 4 aim to provide specific interventions to improve the project-level fundamentals through risk sharing and policy interventions.

Table 4: Project- and market-level interventions

Solution	What does it do?	Limitations: What do experts say?
Addressing revenue and payment risk		
Creditworthy centralized intermediaries	In the Indian context, the Solar Energy Corporation of India (SECI) signs PPAs with project developers and 'back-to-back' agreements with financially weak DISCOMs, acting as a 'shock absorber'.	Even with SECI, more than 40 GW of capacity remains stalled because local DISCOMs are still reluctant to sign the final agreements, highlighting that project-level buffers cannot fully fix underlying sectoral concerns.[58]
Payment security mechanism (PSM)	It is 'a funded capital reserve that provides interest-free working capital to its beneficiary projects in the case of a default event by the DISCOM purchasing its power'.[59]	It works only when the offtaker has underlying fiscal capacity. The underlying financial distress of utilities, with Rs 6.84 trillion[60] in debt in India, remains a fundamental structural barrier that PSM alone cannot resolve.
Addressing regulatory and policy risks		
Competitive auctions and standardized PPAs	Reverse auctions with standardized 25-year PPAs provide revenue certainty, reduce information asymmetry, and improve bankability by giving lenders a predictable cash-flow template.	Aggressive bidding and other tender-design challenges have contributed to project realisation risks: 38.3 GW of utility-scale renewable energy capacity was cancelled between 2020 and 2024, equivalent to around 19 per cent of capacity issued.[61] Conversely, retroactive policy changes can instantly erode investor confidence and stall investment despite technical potential.

The following interventions in Table 5 aim to reduce the systemic risk premiums applied by lenders by building their capabilities and mandating MDBs to go beyond providing grants and facilitating the development of enhanced regulatory frameworks.

While project-level tools such as partial credit guarantees and blended finance instruments can address specific risks, they fail to resolve larger systemic issues embedded in the global financial system which keep the borrowing floor high for the Global South. The following solutions in Table 6 aim to address the structural conditions such as the sovereign rating methodology, dollar hegemony and macro debt sustainability highlighted earlier.

Table 5: Domestic financial system and institutional interventions

Solutions	What does it do?	Limitations: What do experts say?
Addressing the financial sector capabilities		
Move lenders from asset-based to project-based finance lending	Building technical expertise in banks and NBFCs to assess project cash flows rather than the value of collaterals held by developers.	Capability-building is gradual. Even with better lender skills in assessing risks, the sovereign ceiling and dollar hegemony constrain how low interest rates can go and granular project-level pricing cannot overcome a high country-level borrowing floor.
Concessional loans	Concessional loans help absorb early losses from defaults, reducing the risk faced by commercial investors and enabling projects to attract private capital at lower effective rates, particularly for emerging technologies.	Although international climate finance has increased, but the amount is still scarce when compared to the actual global needs.[62]
Evolving role of MDBs		
Technical assistance and institutional capacity building	MDBs provide grants and advisory services for regulatory framework development and project preparation facilities, thus reducing the non-financial barriers to investment.	Technical assistance alone cannot compensate for macro risks. Its benefits are concentrated in the project pipeline and lender capability.

Table 6: International financial architecture reform

Solutions	What does it do?	Limitations: What do experts say?
Sovereign credit rating reform		
CRA methodology reform	Separates the link between GDP per capita and credit ratings. Instead, a reform would allow fiscal trajectory, and growth potential to drive ratings	S&P, Moody's and Fitch are private institutions with no obligation to reform. Institutional investors mandated to use the ratings from the top three CRAs would also need regulatory changes to consider alternative assessments.
African Credit Rating Agency (AfCRA)	Provides sovereign credit assessments grounded in African economic structures, long-term development trajectories, and climate vulnerability profiles.	AfCRA is nascent and could take years to develop the institutional credibility and investor acceptance needed to move capital markets.
Escaping dollar hegemony		
Domestic currency markets	Redirecting the estimated US $17 trillion in EMDE's domestic savings (through pension funds, insurance) into long-local currency green bonds.	Most EMDE capital markets remain underdeveloped, with smaller markets characterized by shallow local-currency bond markets and shorter maturities, constraining their ability to mobilize long-term domestic finance for capital-intensive low-emissions infrastructure.[63]
Redefining MDB mandate		
MDB in first-loss positions	They take the first hit if a project fails, allowing projects to attract the required private capital because of reduced risks.	MDBs resist first-loss to protect their AAA-rating as losing it would raise their own cost of borrowing.

5.2 Can de-risking tools address the root cause or only the symptoms?

Much of the international response to the high cost of capital has centred on de-risking. Development finance institutions, multilateral development banks and governments have increasingly promoted instruments such as guarantees, political risk insurance, blended finance, concessional loans and first-loss capital to mobilize private investment into clean energy projects in developing countries. The underlying logic is straightforward: if investors perceive projects to be less risky, they will require lower returns, reducing the overall cost of capital.

These instruments play an important role. They have enabled projects that might otherwise have struggled to attract financing, particularly in markets with limited investment histories or weak domestic financial systems. For technologies that remain relatively immature, or for projects facing genuine construction, regulatory or offtake risks, de-risking mechanisms can improve bankability and accelerate investment.

However, the evidence presented in this paper suggests that these interventions address only part of the problem.

The central finding emerging from Sections 1 to 3 is that a significant proportion of the cost of capital facing developing countries is established before investors assess the merits of an individual project.

Sovereign credit ratings, foreign exchange risk, macroeconomic conditions, prudential banking regulations and the structural dominance of the US dollar together establish a borrowing floor upon which project-specific risks are subsequently priced. De-risking instruments may reduce the premium associated with individual projects, but they do little to lower this underlying floor.

This distinction is important because it highlights the different levels at which reforms operate. While project-level interventions can improve financing conditions for individual investments, they cannot, by themselves, change the structural mechanisms that produce and price risk across developing economies.

5.2.1 International financial architecture reforms: addressing structural sources of risk

A growing body of literature therefore argues that the cost-of-capital challenge cannot be fully resolved without reforms to the international financial architecture itself.

Proposals by organizations such as UNCTAD as well as recommendations[64] from the UN Secretary-General on reforms to the IFA seek to address the institutional mechanisms through which sovereign risk is defined and transmitted throughout the global financial system. These include reforming sovereign credit rating methodologies, improving the transparency and accountability of credit rating agencies, strengthening debt restructuring mechanisms, increasing the lending capacity of multilateral development banks, and reducing dependence on hard-currency borrowing by expanding local-currency finance.

Unlike project-level interventions, these reforms seek to influence the borrowing floor itself. If sovereign risk assessments align more closely with actual repayment capacity than with structural characteristics such as income level or climate vulnerability, the cost of capital across entire economies could decline rather than only for isolated projects.

Similarly, reforms that reduce exposure to exchange-rate volatility or improve debt sustainability would lower the structural risk premiums embedded throughout financing decisions. In this sense, they address the causes rather than simply the symptoms of elevated financing costs.

Importantly, these proposals are no longer confined to academic debate. Calls for reform increasingly feature across international policy processes, including the Bridgetown Initiative,[65] the V20 agenda, the outcomes of the Fourth International Conference on Financing for Development, and ongoing discussions around multilateral development bank reform. Although these initiatives differ in their specific recommendations, they share a common recognition that mobilizing significantly greater climate finance requires reducing the structural cost of capital facing developing countries.

5.2.2 Implications for climate finance

This distinction carries important implications for international climate finance discussions.

The New Collective Quantified Goal[66] on climate finance seeks not only to mobilize greater volumes of finance but also to improve its accessibility and effectiveness. Similarly, the Baku to Belém Roadmap's ambition of mobilizing US $1.3 trillion annually assumes that private investment can be significantly scaled in developing countries.

Yet if the structural drivers of high capital costs remain unchanged, increasing the volume of available finance alone may not translate into affordable finance. Countries may continue to face borrowing costs that render otherwise economically viable clean energy investments financially unattractive.

Reducing the cost of capital therefore cannot be understood simply as a project finance challenge. It is also a question of reforming the institutions and rules that govern global finance. De-risking will remain an important part of the solution, but it cannot substitute for broader reforms to the international financial architecture that determine how risk is perceived, priced and allocated across the global economy.

Ultimately, lowering the cost of capital is not only about making individual renewable energy projects bankable. It is about correcting structural asymmetries that continue to make the clean energy transition systematically more expensive in precisely those countries where investment is needed most.

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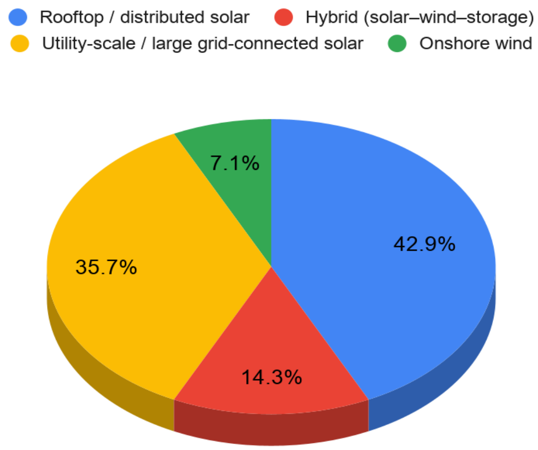
ANNEXURE

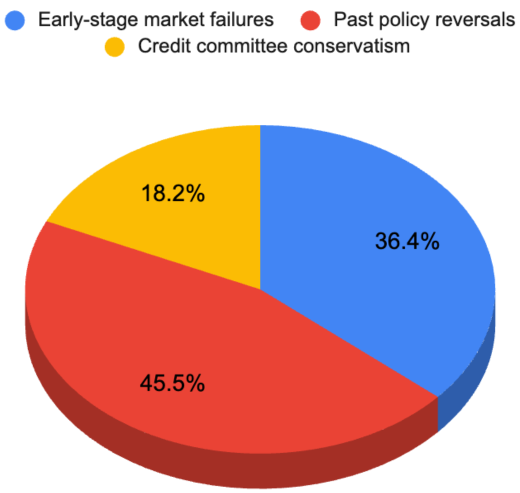
The following figures and tables provide the full underlying data for the survey findings summarized in Section 4.2 (Insights from primary research). Each is cross-referenced from the relevant bullet in the main text.

4.2.1 Risk perceptions

Annexure Fig. A1: Profile of respondents based on the dominant project/technology they work with

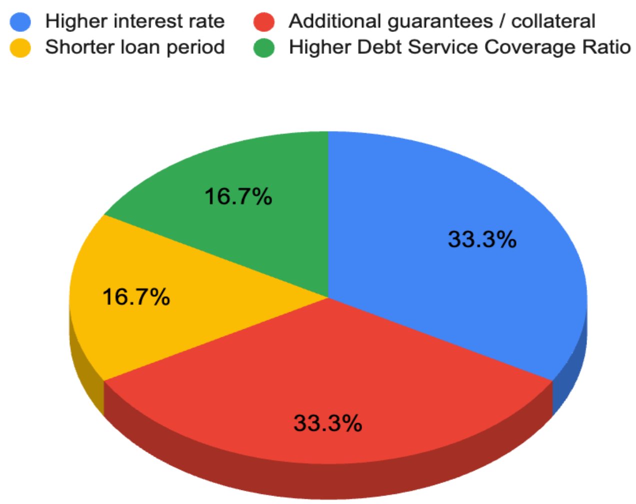


Annexure Fig. A2: Factors that continue to shape current risk perceptions



4.2.2 Translation of risk into financing terms

Annexure Fig. A3: How does a risk get reflected in financing terms—from a lender's perspective? (n=6)



Annexure Table A1: Mode of financing clean energy projects

Financial structure	Number of respondents
Project financing	6
Financial intermediary	1

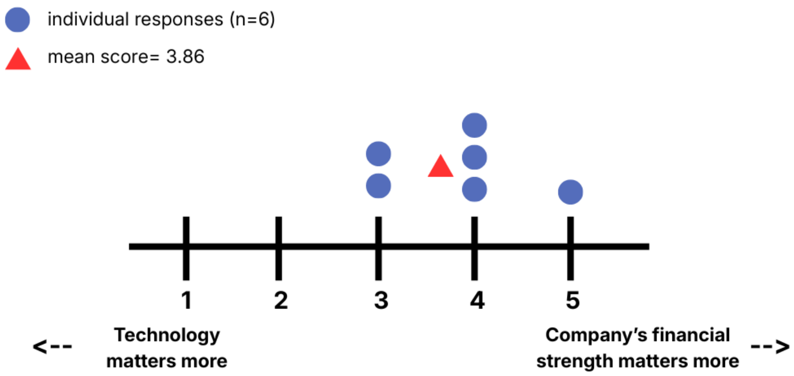
Annexure Table A2: Length of time over which interest is paid

Debt tenor	Number of respondents
6–10 years	2
<5 years	1
11–15 years	1
16–20 years	1
>20 years	1

Annexure Table A3: Interest rates charged by lenders for clean energy projects

Interest rates	Number of respondents
<10%	3
10–13%	2
14–17%	1

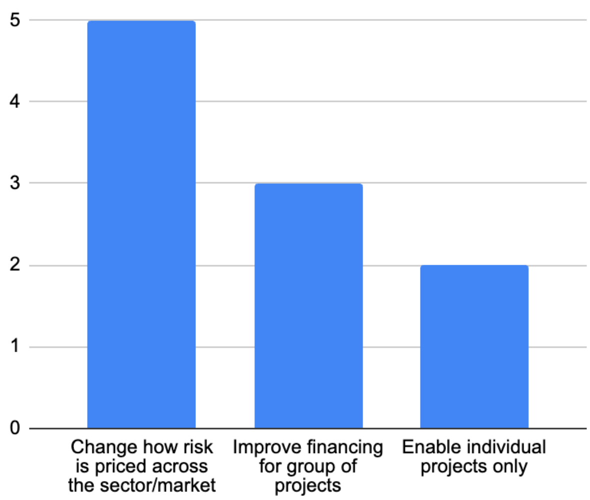
Annexure Fig. A4: Lenders prioritize a company's financial strength over technology in pricing risk



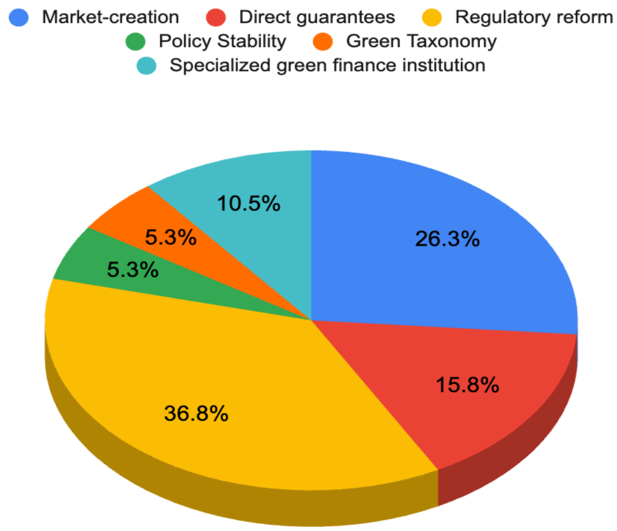
Rating scale: 1= cost of financing entirely technology-driven, 5= balance sheet driven

4.2.3 Effectiveness of interventions

Annexure Fig. A5: What impact do the interventions have? (n=10)



Annexure Fig. A6: What is the government's role in reducing the cost of capital? (n=10)



Glossary of terms in the survey

Based on Table 2: Key risks

Term	Meaning
Offtaker payment risk	Risk that the power buyer delays or defaults on payments
Resource risk	Risk that actual resource availability (sun, wind, water) falls short of projections
Construction risk	Risk of delays, cost overruns, or technical problems during building
Policy/regulatory change risk	Risk that changed laws or tariffs after investment hurt project returns
Land acquisition/permitting risk	Risk of delays or disputes in securing land rights and approvals
Grid curtailment risk	Risk that the grid operator limits power off-take because the grid can't absorb it
Refinancing risk	Risk of being unable to refinance debt on favourable terms when it comes due
FX risk	Risk of loss from exchange rate movements, especially when revenue and debt are in different currencies

Based on Table 3: Interventions

Term	Meaning
Government-backed offtaker guarantees	Government commits to covering payment if the offtaker (usually a state utility) defaults
Concessional loans	Loans with below-market interest rates or longer tenures, typically from development banks
Standardized PPAs	Power Purchase Agreements with uniform, pre-agreed terms, reducing negotiation and legal uncertainty
Policy credibility and governance	Consistency and transparency of government policy and institutions, giving investors confidence that rules won't change arbitrarily
Partial credit guarantees	A third party covers part of a loan if the borrower defaults, lowering lender risk
Currency hedging facilities	Financial tools that protect against losses from exchange rate fluctuations
Political risk insurance	Insurance against losses from government actions such as expropriation or contract breach

Developing countries pay roughly twice as much to finance the same clean energy project as advanced economies—not because their projects are riskier, but because the global financial system prices risk in ways that structurally penalize the Global South. Subjective credit ratings, dollar-denominated debt, and banking rules such as Basel III keep borrowing costs high regardless of a country's fundamentals.

India makes the point starkly: despite strong growth and sound fiscal indicators, it borrows at rates 300–640 basis points higher than France, Italy or Japan, with financiers on the ground pointing to delayed state utility payments, not currency or technology risk, as the real driver.

De-risking tools—guarantees, blended finance and payment security mechanisms—can make individual projects more bankable, but they cannot affect the sovereign ceiling, dollar hegemony or rating methodologies that set the floor beneath which borrowing costs cannot fall. Fixing that requires reforming the international financial architecture itself—not just more money on the table, but a change in how that money is priced.

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