ACCELERATING THE ENERGY TRANSITION IN EMERGING MARKETS:

Strategies for unlocking investment

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EVALUATION AND LEARNING //
Summary Brief

CIF Program:
Clean Technology Fund

TOPICS

- Concessional finance
- Clean technology
- Emerging markets

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1. INTRODUCTION

With costs dropping dramatically in recent years, solar and wind power have emerged as the cheapest sources of electricity in many markets. The perception of renewables as risky—long a barrier to investment—has declined significantly. Improved and lower-cost battery storage and other technologies are making it easier to integrate intermittent renewables like solar and wind into the grid. And green hydrogen is paving the way to decarbonize heavy industry and other sectors.

Yet the vast majority of renewable energy resources remains untapped, especially in lower income countries. In Africa, for example, the technical solar potential is estimated at 7,900 GW, but as of 2020, installed capacity was just 10.4 GW. Potential wind power generation is estimated at 461 GW, but as of 2020, installed capacity was just 6.5 GW.[1]

For more than 15 years, the CIF has supported renewable energy deployment in developing countries with its concessional finance. This brief, which draws on a CIF-commissioned independent report by Bloomberg New Energy Finance, identifies ways for the CIF and its partners to maximize their impact on renewable energy growth in emerging markets, focusing on ways to help create enabling environments for investment and drive down costs.

The brief is organized around three pillars:

1 **accelerating the deployment of mature technologies,**

2 **supporting the deployment of new technologies,** and

3 **supporting a just transition from fossil fuels to renewables.**

1 IRENA. 2022. "Renewable Energy Market Analysis: Africa and Its Regions." Abu Dhabi: International Renewable Energy Agency.

2. ACCELERATING THE DEPLOYMENT OF MATURE CLEAN ENERGY TECHNOLOGIES

With the costs of solar photovoltaic (PV) and onshore wind power now equal to or lower than those for fossil fuels in many markets, the impact of concessional debt has diminished. For the greatest transformative potential, the CIF and its partners should reallocate resources to address key unmet needs. The analysis recommended several ways to target resources more effectively:

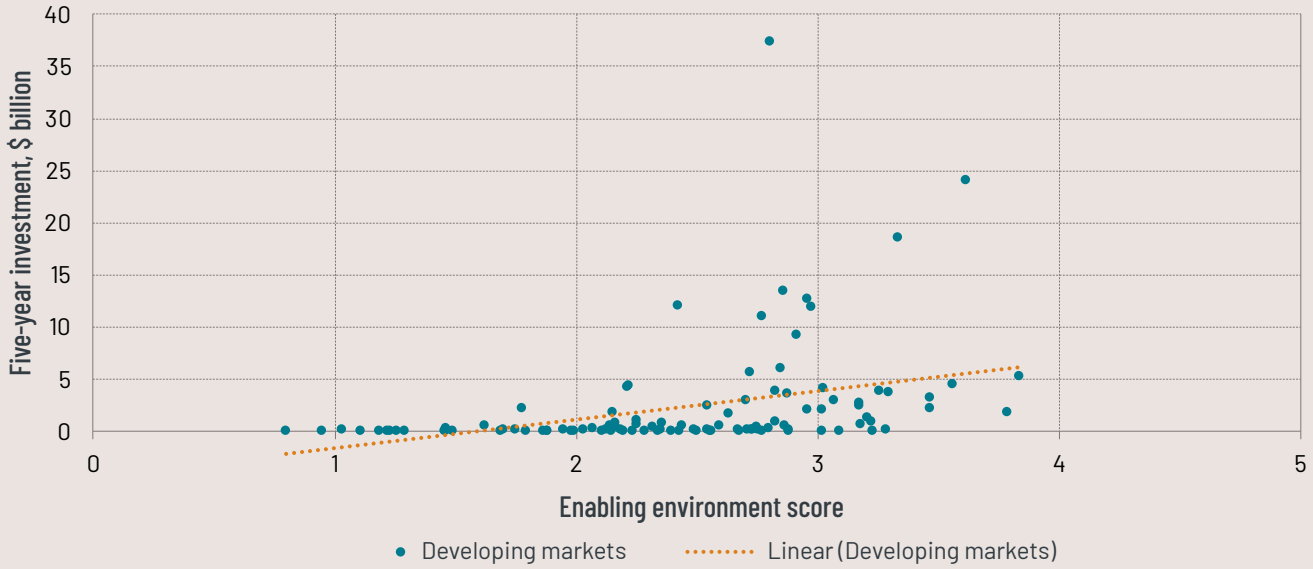
Identify countries in which the markets for PV and/or onshore wind are now mature, meaning the technology costs and risks are low enough for scaled private investment; in those countries, concessional debt is no longer transformative in unlocking investment—though, as discussed below, funding for technical assistance may still be important. Concessional debt however remains crucial for catalyzing investment in markets that may already have a strong enabling environment in place, but have limited experience in deploying these technologies.

Prioritize funding for technical assistance in countries with weak enabling environments to attract renewable energy investment. This means aligning policies, operating rules, and incentives, and removing regulatory and other barriers to investment. Measures that have proven effective include renewable energy auctions, feed-in tariffs, net metering, clean energy targets, energy-related commitments in nationally determined contributions (NDCs), net-zero emissions targets, priority grid access for renewables, and energy access targets, among others.

As shown in Figure 1, developing countries with higher enabling environment scores in 2024 on the market assessment tool Climatescope[2] generally attracted more investment in renewables than those with low scores. Indeed, the top 15 scorers attracted 224 times as much investment in 2019–2023 as the 15 markets with the lowest scores.

2 Climatescope is an annual online market assessment tool, report, and index that includes market-level data on the energy transition for over 140 markets, including 110 emerging markets and 30 developed ones. See http://www.global-climatescope.org.

FIGURE 1. Enabling environment score in Climatescope 2024 vs. renewable energy investment in 2019–2023



Source: BloombergNEF.

Note: Investment includes new-build asset finance for renewable energy and small-scale solar PV. The score is each market's Climatescope Fundamentals score, which encompasses key policies, market structure, and barriers that could hinder investment. Brazil and India are not featured on the chart for visualization purposes but included on the trend line. China is not included.

Fund technical assistance to help countries design markets that can integrate a growing share of intermittent renewable energy while maintaining system stability. The need for this kind of assistance increases as the share of renewables in the power mix grows, and it is crucial to enabling solar and wind to play a significant role in diversifying energy systems and enhancing energy security. The CIF and its partners can help countries address bottlenecks that hinder the continued growth of renewable energy, support power grid upgrades and the addition of energy storage (see below), and redesign their power markets to facilitate solar and wind penetration.

The CIF and its partners also have a key role to play in helping to mitigate country-, market-, and currency-related risks that continue to hinder investment. Country risks are the political, regulatory, and macroeconomic uncertainties that are common in many emerging markets. Investors may worry about sudden policy shifts, delays in project approvals, exchange rate volatility, and weak utilities with limited capacity to integrate renewables into the grid, for example. Political and regulatory risk guarantees can help, along with technical assistance to strengthen policy and regulatory frameworks.

Market risks are uncertainties about revenue streams due to a lack of long-term contracts, stable pricing mechanisms, and/or creditworthy offtakers, for instance. Long-term power purchase agreements (PPAs), payment guarantees, and mechanisms to improve offtakers' creditworthiness can help address these risks.

Currency risk can also hinder foreign investment in emerging markets. Many developing economies rely on external investors to scale deployment, and exchange rate volatility can impact investor returns and increase financing costs. It can also introduce uncertainties into project cash flows, particularly when contracts are paid in local currency but financed in foreign currency. Addressing currency risk requires targeted interventions, including hedging instruments and greater access to financing in the local currency.

3. ACCELERATING THE DEPLOYMENT OF LESS-MATURE CLEAN ENERGY TECHNOLOGIES

Concessional finance remains a vital tool for accelerating the deployment of less-mature technologies such as battery storage and green hydrogen. Combining concessional debt and equity, equity guarantees, and capex subsidies can be the most effective approach to help scale battery markets, while for green hydrogen, support for creating an enabling environment is particularly crucial.

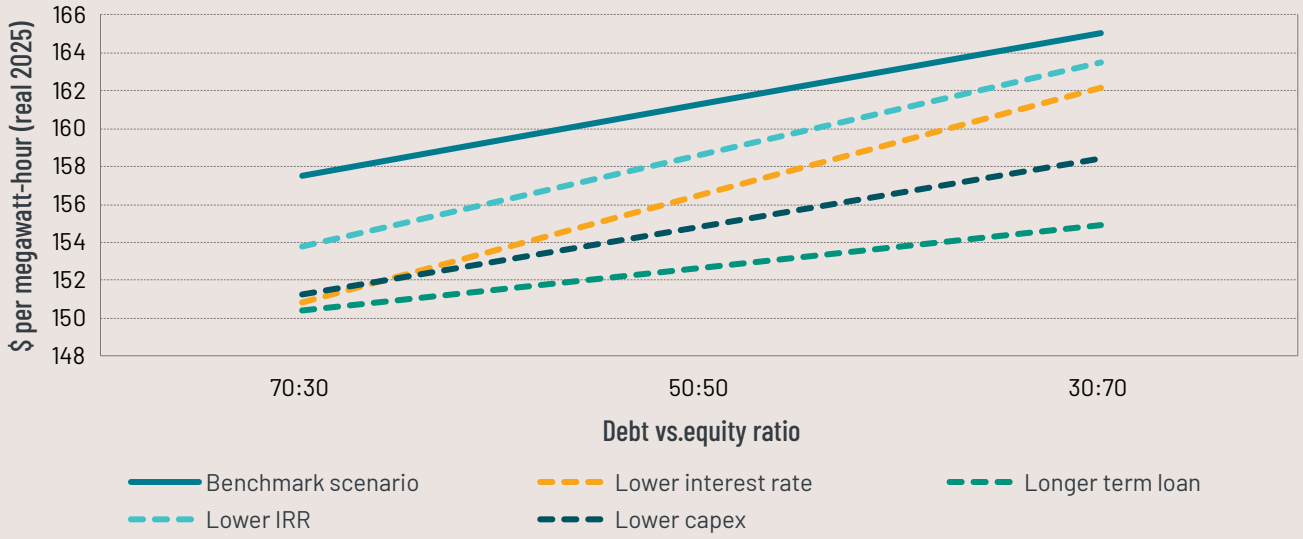
To make the most of their renewable energy resources, countries need to deploy not only solar PV and wind power, but also technologies for which global markets are less mature, such as battery storage—to enable the integration of intermittent renewables at scale—and green hydrogen to provide a clean and affordable alternative to fossil fuels for heavy industries and other applications.

3.1. Battery storage

Power generators who install battery storage can recoup their costs through various revenue streams, which may reimburse them per megawatt-hour (MWh) or per kilowatts of capacity per year (kW/yr). The most common measure of costs is the levelized cost of electricity (LCOE)—that is, the long-term price per MWh needed to recoup all project costs (including capital and operational expenditure, or capex/opex) and financing costs—and achieve the minimum internal rate of return (IRR) expected by equity investors.

Financing costs make up a significant share of the overall cost of battery storage systems. As shown in Figure 2, an analysis of the potential benefits of reducing different aspects of those financing costs highlighted four key ways in which concessional finance from the CIF and its partners can make a significant difference:

FIGURE 2. Sensitivity analysis of levelized cost of electricity (LCOE) in 2025 for a four-hour, utility-scale battery storage system under different finance and capex scenarios and gearing ratios



Source: BloombergNEF.

Note: IRR is internal rate of return; capex is capital expenditure. Technical assumptions, market rates, and capital and operating expenditures are based on available data for India. Interest rates, tenor of loan and internal rate of return (IRR).

- **Helping to increase the debt-to-equity ratio:** Debt is generally less expensive than equity, because equity investors expect higher returns to compensate for the risks they are taking, and their returns depend on project profitability. The X axis in Figure 2 shows the dramatic impact of shifting from a 70:30 debt-to-equity ratio to a 30:70 ratio—a 5 percent increase in the LCOE.
- **Reducing the cost of debt:** All else being equal, the analysis found that increasing the loan tenor from 10 to 16 years reduced the LCOE by 4 percent. A 10 percent drop in interest rates reduced the LCOE by 2.3 percent.
- **Reducing the cost of equity:** The analysis found that a 10 percent reduction in the expected equity IRR led to a 4.5 percent drop in the LCOE with a 70:30 debt-to-equity ratio, and a 6.2 percent drop when assuming a 30:70 ratio.
- **Reducing capital expenditure:** Providing grants or—through governments—subsidies to help cover the initial investment costs for a project can help projects get off the ground and reduce financing costs. The analysis found that a 5 percent capex reduction reduced the LCOE by 4 percent.

Overall, the analysis found, integrated financial solutions that combine concessional debt and equity, equity guarantees, and capex subsidies can be the most effective approach to help achieve competitive costs and enable storage technologies to scale up.

3.2. Green hydrogen

For many applications that still require burning a fuel—such as many processes in heavy industry, as well as long-haul freight, shipping, and aviation—green hydrogen offers a sustainable alternative. Hydrogen can also help integrate variable renewable energy, being one of the few options for storing energy over weeks or months. For countries with ample renewable energy and water supplies, green hydrogen could become an important alternative to fossil fuel imports, and a potential new export.

As of January 2025, at least 30 emerging markets had developed a hydrogen strategy or roadmap, and another 20 were preparing one—a major shift since 2020, when Chile was the only emerging market

with a hydrogen strategy. Still, investment in green hydrogen has been slow to take off, largely because the technology is still relatively new and thus costly, and enabling environments are not yet in place. A key role for the CIF and its partners is to help overcome these challenges.

Supporting countries to develop a robust enabling environment is the most impactful way to accelerate green hydrogen deployment. Catalyzing investment in green hydrogen requires coordinated actions across policy, regulation, infrastructure planning, and market development. Without supportive policies, incentives, and regulatory certainty, private investors will remain hesitant, as project risks would be high. The CIF and partners can play a transformative role by supporting governments in designing national hydrogen strategies, regulatory frameworks, demand-side policies, and infrastructure roadmaps.

Governments must determine the best hydrogen use cases and where and how to deploy support. The focus of hydrogen policies will differ across economies, depending on whether they have major industries that could use the fuel (e.g., steelmaking, ammonia production) or are mainly targeting export markets. Some domestic policy goals might be better achieved through technology- or sector-neutral approaches. If the goal is to export hydrogen, it is important to recognize that the sector has yet to reach scale in developed countries, which amplifies the risks and uncertainties for emerging economies. Storage and transportation issues, high logistical costs, and competition from established producers may also pose challenges. Technical assistance can help governments sort through these issues and identify the best approach for their country.

4. ENSURING A JUST TRANSITION FROM FOSSIL FUELS TO RENEWABLES

The CIF and its partners can facilitate the transition from fossil fuels to renewables by helping to make projects more cost-competitive and by helping countries address the social and economic impacts of the transition.

Countries have much to gain from developing renewables to reduce dependence on fossil fuels, expand energy access, and support economic growth. The replacement of fossil-fuel based energy generation must provide grid stability, ensuring reliability comparable to the baseload generation that fuel sources, such as coal, has historically supplied. Co-locating storage with renewables is essential in this context, but high costs remain a significant barrier to scaling adoption, especially in emerging markets.

Concessional finance is critical for making renewables-plus-storage more cost-competitive. For example, in South Africa, the LCOE of a solar PV array with battery storage would need to drop by 15–26 percent to compete with existing coal power plants by 2027, which the report considers the earliest year possible to retire coal plants. The LCOE of onshore wind with storage would need to drop by 24–33 percent. Achieving these decreases requires a combination of financial mechanisms that address capex, cost of debt and the cost of equity.

Reducing financing costs can play a pivotal role in achieving a competitive LCOE. For instance, for solar PV with storage in South Africa in 2027, a 1 percent reduction in the cost of equity would reduce the LCOE

by 0.35–0.36 percent. A 1 percent reduction in the cost of debt for operations would reduce the LCOE by 0.30–0.33 percent.

Financial instruments to support the retirement of coal plants can facilitate the smooth transition to renewables. Even if a coal power plant is old and inefficient, the upfront investment made in building it may encourage the operator to keep it running, especially if the coal itself is inexpensive. Some mechanisms to help countries accelerate the shift away from coal include:

- **Compensation schemes,** which provide direct financial assistance to utilities and coal plant operators to offset revenue losses.
- **Coal asset buyouts,** in which multilateral development banks (MDBs) and/or other stakeholders purchase coal plants to decommission them ahead of schedule.
- **Carbon pricing mechanisms,** which generate revenue that can be invested in the energy transition.
- **Transition-linked loans and green bonds,** which channel private capital into projects supporting renewable energy deployment and the energy transition.
- **Debt-for-climate swaps,** which can enable countries to redirect portions of their debt repayment obligations toward financing the energy transition.

Technical assistance and capacity building are crucial to help countries create a strong enabling environment for the energy transition. Shifting from coal to renewable energy, at scale, is a major endeavor that may require significant policy changes. Countries can benefit from targeted technical assistance to address the complexities of the energy transition, including through power sector planning, support for utilities, addressing legal barriers, removing subsidies that give coal an advantage over renewables, and assessing the economic, environmental, and social impacts of the transition.

Strong stakeholder engagement and targeted measures to mitigate socioeconomic impacts are crucial for a fair and smooth energy transition. The closure of coal plants will affect workers at the plants and in coal-producing regions, as well as their households and communities. The CIF and its partners can play a crucial role in helping governments design and implement comprehensive strategies that mitigate impacts on coal workers and communities while creating new economic opportunities for those affected. Effective efforts prioritize inclusive stakeholder engagement, skills development, transparent communication, and targeted financial support.

The over $12 billion CIF is the pioneer multilateral climate fund, mobilizing low-cost finance for energy transitions and sustainable development in more than 80 countries. Established in 2008, the CIF delivers funding exclusively through six AAA-rated multilateral development banks. In a world first, in 2025, the CIF accessed capital markets to unlock private sector capital through the CIF Capital Markets Mechanism (CCMM).

The CIF's high-quality funding mobilizes over $8 in co-financing for every $1 invested. This lowers risk and enables first-of-their-kind investments in clean energy, industry decarbonization, resilience and nature-based solutions. Our approach empowers developing countries, promotes just transitions and accelerates transformational change.

Learn more on cif.org

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