SRMI Sustainable Renewables Risk Mitigation Initiative

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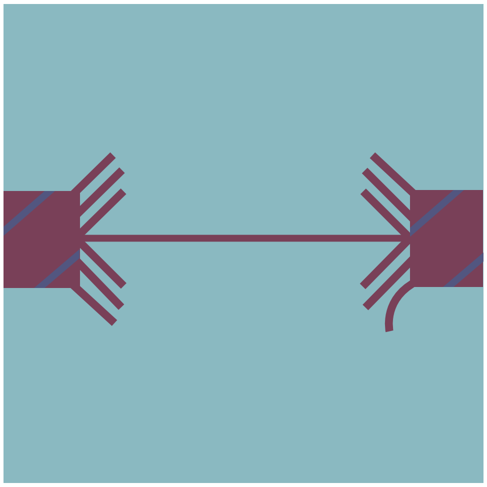

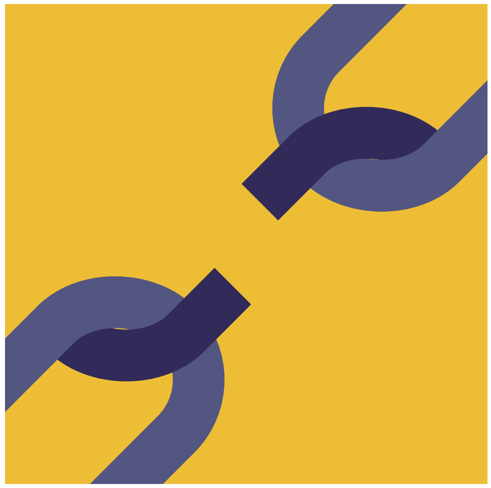

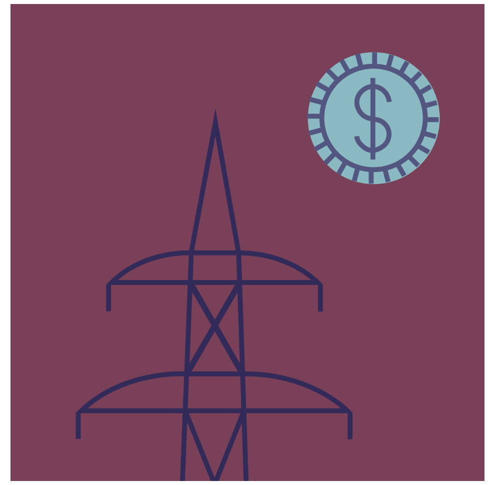

How to Unlock Pipelines of Bankable Renewable Energy Projects in Emerging Markets and Developing Countries?

Public Disclosure Authorized

POSITION PAPER

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SRMI Sustainable Renewables Risk Mitigation Initiative

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ACRONYMS

ADB:	Asian Development Bank
AFD:	Agence Française de Développement
AfDB:	African Development Bank
CIF:	Clean Investment Fund
CTF:	Clean Technology Fund
DFI:	Development Finance Institution
EBRD:	European Bank for Reconstruction and Development
EMDC:	Emerging Markets and Developing Countries
FIT:	Feed-in-Tariff
FX:	Foreign Exchange
GIZ:	Deutsche Gesellschaft für Internationale Zusammenarbeit
GCF:	Green Climate Fund
HFO:	Heavy Fuel Oil
IEA:	International Energy Agency
IFI:	International Financial Institution
IPP:	Independent Power Producers
IRENA:	International Renewable Energy Agency
ISA:	International Solar Alliance
JETP:	Just Energy Transition Partnership
KfW:	Kreditanstalt für Wiederaufbau
MDB:	Multilateral Development Bank
PPA:	Power Purchase Agreement
PPP:	Public Private Partnership
PRC:	People's Republic of China
PRG:	Partial Risk Guarantees
PRI:	Political Risk Insurance
PV:	Photovoltaic
SDG:	Sustainable Development Goals
SIDS:	Small Island Developing State
SSA:	Sub-Saharan Africa
SE4All:	Sustainable Energy for All
SRMI:	Sustainable Renewables Risk Mitigation Initiative
VRE:	Variable Renewable Energy
WACC:	Weighted Average Cost of Capital

Executive Summary

The energy transition will require a major scale-up in the deployment of renewable energy with both public and private finance playing critical roles. Aligning with the Paris Agreement targets needs tripling of total renewable energy capacity in Emerging Markets and Developing Countries (EMDC) by 2030, significantly augmenting financing flows towards renewable energy projects. While the "billions to trillions" concept, which involves leveraging a small injection of public funds to unlock vast amounts of private resources is appealing, the current situation is far more intricate and demanding than often presented.

Scarcity of financing is not an impediment to renewable energy deployment, but the limited availability of bankable projects is. Even under challenging environments, when bankable projects are tendered, investors actively respond to these opportunities and mobilize private investment. However, there is today a global shortage of bankable renewable energy projects available for private investment.

Developing a pipeline of bankable projects requires coordinated interventions by governments targeting unique barriers and risks within a country. Governments must deliver the energy transition, while enhancing affordability and reducing poverty. To achieve this, governments with the support of Multilateral Development Banks (MDBs) and other development partners can address country and project-specific barriers to lower risk levels perceived by Independent Power Producers (IPPs), creating the environment necessary to develop a pipeline of renewable projects.

Governments, with the support of development partners, could prioritize the following interventions to create the enabling environment necessary to unlock a pipeline of bankable renewable energy projects:

- **Adopt a medium / long term vision and commitments.** A successful implementation of the energy transition needs a systemic shift across the government and the administrations responsible for the transition towards adopting articulated and tangible energy transition plans with clearly defined roles and responsibilities for the implementing institutions. Consistency and predictability are critical aspects for IPPs and must withstand changes in government administration.
- **Establish a stable and comprehensive regulatory framework.** A stable regulatory framework, with adequate parameters, is a key determinant of how much private capital can be mobilized for a country's energy sector. Two key regulatory aspects need to be in place, namely a regulatory regime that allows IPPs to own generation and grid connection assets, and for the utility/offtaker to be allowed to launch a competitive tender.
- **Develop competitive and transparent procurement processes.** Consistent, transparent, and competitive procurement processes reduce the procurement and corruption risks, thereby contributing to lower tariffs. Tenders should be rooted in sound legal grounds and in comprehensive generation plans developed alongside variable renewable energy (VRE) integration analyses. To ensure the successful completion of a tender, it is essential to limit or stall bilateral non-competitive deals.

- **Implement power sector reform and project-specific risk mitigation measures to reduce offtaker risk**, a common issue in EMDC. Improving utility creditworthiness involves addressing energy sector fundamentals, but this is a lengthy process. Simultaneously, specific actions can be taken to lower private sector risks, including implementing project-specific risk mitigation measures like credit enhancement mechanisms.
- **Develop tomorrow's grid.** Weak grids and curtailment risk are another significant barrier to renewable energy scale-up in EMDC. Harnessing the potential of VRE requires substantial expansion and modernization of electrical grids, careful power system planning, and grid management tailored to improve the grid flexibility. Governments and utilities can address curtailment risk through three types of interventions: (i) select a deployment scheme indicating the connection point in the grid; (ii) finance the identified grid reinforcements needs; and (iii) legally allocate the curtailment risk in the Power Purchase Agreement (PPA) via a take or pay agreement. Furthermore, securing financing for grid reinforcements is essential to ensure the timely availability of connection points and system strengthening to manage different forms of generation in a decarbonized grid.
- **Address foreign exchange (FX) issues.** The cost of capital for renewable energy projects tends to be significantly higher in EMDC than in advanced economies. In most EMDC, the domestic lending market is not expected to transform fast enough to fund all local projects, meaning international sources of finance are often required. The FX risk can be tackled from the IPP perspective through a PPA denominated in hard currency. However, this solution could become a major risk for the energy transition and the viability of the utilities. The development of privately-owned generation will have to come with a larger discussion on domestic lending markets to ensure that the FX risk is not derailing the transition.

Implementing these solutions may require coordinated development partners' support and concessional financing to ensure that high development impact investments can materialize. MDBs and other development partners can provide technical assistance to tackle procurement and regulatory challenges, finance targeted public investments and provide risk mitigation instruments. In some cases, allocating concessional funds to unlock renewable energy projects will act as a strong enabler for future investment. By reducing the financial risks early on, grants and concessional finance can pave the way to attract private sector investments and reduce the cost of the energy transition for EMDC.

A successful pilot does not make for a sustainable pipeline. Concessional finance should not be used to overcome a barrier for one project, but to reduce the barriers for both the project and for those that will follow. The only way to achieve scale is to use targeted concessionality to create the pipeline and, in some countries, to support utilities on their path to creditworthiness. MDBs and development partners have a key role to play by providing the appropriate instruments with the right concessionality.

Development partners can also provide innovative financing solutions to tackle risks that cannot be covered by existing instruments. Even when most barriers are lifted, some country specific residual risks can occur at the project level. Existing risk mitigation instruments are often inadequate, failing to address new emergent risks. Newly identified risks to the energy transition include the risk of having cheaper fossil alternatives, FX constraints, and innovation risk. By leveraging donor and climate funds, development partners can structure instruments to cover these residual risks and ensure that barriers preventing projects from reaching financial closure are lifted.

In conclusion, while the "billions to trillions" concept is attractive, making it a reality proves challenging. Leaders must recognize that building a bankable project pipeline demands time, dedication, and strategic use of concessional funds and subsidies. Overcoming capacity constraints and creating an enabling environment in EMDC necessitates sustained commitment and collaboration. Acknowledging and addressing these complexities will open the door to a more practical and sustainable approach to leverage private sector investments for climate action.

1. Introduction

1.1 THE SLOW PACE OF RENEWABLE ENERGY DEPLOYMENT

Over the past decade, Burkina Faso's energy sector improved significantly, creating a promising market for renewable energy. Despite facing political and security challenges, the country has shown a strong commitment to renewable energy development. With support from MDBs, Burkina Faso is progressing towards two key development goals: providing electricity to more people and transitioning to cleaner energy sources.

Drawing from Burkina Faso's successful example, the energy transition will require a comprehensive transformation of the power sector particularly in developing countries. The World Bank's report "*Scaling Up to Phase Down*"[1] provides a roadmap to achieve universal access to energy, and net-zero emissions by mid-century. The energy transition not only benefits climate objectives but is also critical for development, economic growth, and poverty reduction by supporting reliable access to electricity.

If increasing the deployment of renewable energy is needed to reduce reliance on coal, this scale-up poses significant challenges. Its current deployment pace is not yet at the scale needed. As per the International Energy Agency (IEA)'s net zero scenarios, a staggering 7,000 GW of new renewable energy capacity must be deployed by 2030 globally to align with the climate objectives of the Paris Agreement.[2] Around one third of this target, 2,100 GW, must be implemented in EMDC (excluding People's Republic of China [PRC]).[3]

TABLE 1: ANNUAL CLEAN ENERGY INVESTMENTS IN EMDC TO 2035 TO ALIGN WITH SDGS AND CLIMATE GOALS

	HISTORICAL		ANNUAL AVERAGE REQUIRED	
(BILLIONS USD 2022)	**2015**	**2022**	**2026-2030**	**2031-2035**
Total EMDCs	**538**	**773**	**1,784-2,222**	**2,219-2,805**
By country/region				
China	287	511	730-853	850-947
India	55	59	253-263	325-355
Southeast Asia	28	30	171-185	208-244
Other Asia	21	23	68-85	93-112
Africa	26	32	160-203	207-265
Latin America	63	66	150-243	209-332
Europe and Eurasia	33	31	111-188	127-232
Middle East	24	21	122-202	176-318

SOURCE: IEA AND IFC, 2023

1 World Bank, 2022, Scaling up to phase down.
2 IEA, 2022, World Energy Outlook.
3 IEA, 2023, Net Zero Roadmap: A Global Pathway to Keep the 1.5 C Goal.

However, the number of renewable energy projects getting financed and in operation in EMDC today falls significantly short of the required scale. The total capacity of renewable energy installed is only 783 GW in EMDC (excluding PRC). This installed capacity will need to triple within 6 years. In the Sub-Saharan Africa (SSA) region alone, the installed capacity for solar and wind generation is 11 GW, far from the 250 GW needed by 2030 to align with the Sustainable Development Goals (SDGs).[4]

To meet the SDG targets, in EMDC (excluding PRC), clean energy investments, including investments in renewable energy, grid reinforcement, storage, energy efficiency, electric mobility and low-emission fuels, must experience an exponential surge, transitioning from the current annual investment of US$ 260 billion to a substantial US$ 1.4-1.9 trillion per year until 2035 (Table 1).[5] This equates to a tenfold increase in investments in most regions.

1.2 OBJECTIVES OF THE PAPER

This paper aims to assess the reasons for the overall slow pace of renewable energy deployment, in particular solar and wind, to unpack the rhetoric around "billions to trillions" that often leaves on the side of the road many EMDC, and to propose solutions to the key barriers identified. By examining successful factors behind the creation of a pipeline of bankable renewable energy projects in some countries and assessing how these factors can be replicated and adapted to other EMDC, the paper focuses on the critical role of governments, development partners and public financing to mobilize private investments in renewable energy. This paper focuses on the need to develop bankable projects to leverage private investment, even in challenging environments, as public financing is scarce. The paper does not cover the contexts where attracting the private sector proves to be extremely challenging, justifying the use of public funding for renewable energy projects that significantly impact development, such as poverty alleviation or meeting basic needs.

EMDC include very heterogenous countries, with diverse level of development and institutional set ups, and different size of market and renewable energy deployment. For this position paper, EMDC were grouped under four categories:

1. Countries with a functioning power sector and, in some cases, a power market, leading to large deployment of renewable energy such as PRC,[6] India and Brazil.
2. Countries that successfully mobilized large amounts of private investments in renewable energy but are now hitting a ceiling due to technical constraints (demand, risk of curtailment etc.) or bankability ones (mostly offtaker risk) such as Vietnam, Burkina Faso and South Africa.
3. Countries that successfully completed a few pilot projects but have not moved to the next phase of scaling up renewable energy deployment such as Indonesia, Zambia and Mali.
4. Countries that have not been able to attract yet private investments to start their renewable energy deployment such as Zimbabwe and Mauritania.

This paper will focus on assessing the barriers to develop a bankable pipeline of renewable energy projects for the last two to three categories of countries, while leveraging the experience and lessons learnt of countries in Category 1 and 2.

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4 IEA, 2022, Africa Energy Outlook.

5 IEA and IFC, 2023, Scaling up private finance for clean energy in emerging and developing economies. These scenarios are based on assumptions on economic growth and energy efficiency, which may be different in other scenarios.

6 The key difference for PRC with the other countries is that most of its generation is financed by State-Owned-Enterprises or by State banks.

2. The Barriers Hindering the Deployment of Bankable Renewable Energy Projects

The scarcity of financing is one of the frequently cited impediments to the widespread adoption of renewable energy sources. However, when countries can develop bankable renewable energy programs with the right enabling environment, investments do flow in. Between 2015 and 2022, clean energy investments have seen a clear upswing, with a 40 percent increase in financing mobilized in EMDC.[7] Nevertheless, a significant caveat exists: a staggering 75 percent of these investments in 2022 was concentrated in just three countries, namely PRC, India, and Brazil, with 170 GW, 22 GW, and 16 GW of new renewable energy capacity financed, respectively. It is key to unbundle EMDC as a group to assess why some countries struggle to create the right enabling environment to attract private investments while others did succeed.

2.1 BANKABLE PROJECTS ARE NOT LACKING PRIVATE FINANCING

Although financing for renewable energy is available at the global level, the question remains as to why many EMDC are struggling to attract affordable investments for renewable energy projects. One of the main obstacles lies with the limited number of projects considered bankable by lenders and investors. A renewable energy project is considered bankable when it is financially viable and attractive to investors. It must demonstrate a combination of factors that instill confidence in investors, such as a clear and stable revenue stream, a well-defined regulatory framework and an overall financial structure that ensures a high enough return on investment. In some cases, international and development support would be a pre-requisite to bankability.

However, many EDMC do not have projects that combine these factors. On the African continent, only a meager 10 percent of infrastructure projects progress from the pipeline stage to financial closure, while 80 percent of projects fails at the feasibility and planning stage.[8] This is not indicative of a scarcity of private-sector finance. Instead, it underscores the challenges investors face in identifying financially viable projects that align with their risk appetite.

Across various regions, when bankable projects are tendered, investors actively respond to these opportunities, and private investment is mobilized, even in challenging environments. Notably, in the aftermath of a military coup, Burkina Faso was able to attract investors to finance and operate six solar projects representing half of its installed capacity, 180 MWp[9]. Similarly, the Maldives, a Small Island Developing State (SIDS) with a modest market, achieved the signing of the lowest-cost PPA among island nations.[10] And Argentina, despite its history of defaults, successfully mobilized IPPs to develop 1 GW of new renewable energy projects.[11] These cases illustrate that, even in complex environments, private investors remain interested when presented with bankable projects. It also showcases the willingness of financiers to support the energy transition in EMDC.

7 IEA and IFC, 2023, Scaling up private finance for clean energy in emerging and developing economies.
8 McKinsey, 2020, Solving Africa's infrastructure paradox.
9 Nagreongo (30 MWp), Ouaga Nord-Ouest (42 MWp), Pâ (30 MWp), Kodéni (38 MWp), Zina (26 MWp) and Zano (24 MWp)
10 https://blogs.worldbank.org/endpovertyinsouthasia/why-maldives-5-mw-solar-project-game-changer
11 https://www.esmap.org/sites/default/files/events-files/8_20190205_WorldBank-ESMAP-MMorrone.pdf

BOX 1

PROJECT BANKABILITY: RISK ALLOCATION AND IMPACT ON PPA PRICES

Key project risks perceived by investors and lenders include, among others, utility credit -worthiness, grid curtailment and political risks. The specificities of these risks vary from one country to another. In the Sustainable Renewables Risk Mitigation Initiative (SRMI) methodology[12], the risks were grouped into two overarching categories:

- **Project development risks,** risks encountered during the development phase, which occur prior to construction and operation, that encompass (i) grid risk, including connection risks; (ii) land risk, including ownership, availability, permitting, and environmental and social aspects; (iii) resource risk, for wind and geothermal in particular; (iv) legal risk, including the applicable regulatory, arbitration, and judicial frameworks; (v) procurement risk, including risk to have failed tenders, poor capacity of the offtaker and no generation plans where that given project would be stated; and (vi) integrity and corruption risk.
- **Project operational risks,** risks that surface once the project is operational and would impact the financing, that encompass (i) offtaker credit risk including the offtaker's record of performance and timely payment, and risk of contract termination; (ii) the country's power sector risk, including sector financial sustainability risk, reform risk, regulatory risk, and delay in the government's construction work for grid reinforcements leading to curtailment risks; (iii) market risk, including currency risk and financing risk; (iv) country and macroeconomic risks; and (v) political risk, including breach of contract, expropriation, transfer restriction, currency inconvertibility, and war and civil disturbance.

The realization of these risks is dependent on the specificities of each country. For example, issues like land constraints are more prevalent in SIDS, while political risks' incidence might be less likely in Malaysia than in Mali. These key risks have a direct impact on IPPs and lenders' cost of capital. If the risks at project level are deemed excessively high, the project will not come to fruition. The cost of capital reflects both investors' confidence in achieving expected equity returns and lenders' assurance that debts will be repaid. To facilitate investments in EMDC, it is crucial to identify the perceived risks affecting investors and lenders confidence, assess their relative significance at the project, sector, and country levels, allocate these risks between public and private stakeholders, and adopt strategies to mitigate any residual risk.

Clear and defined contractual agreements are crucial for effectively allocating the risk between private and public stakeholders. This allocation allows governments to address identified risks, enabling renewable energy projects with cost-effective tariff and minimal risk premiums. However, contracts cannot cover all the risks. Risk mitigation instruments, such as guarantees or insurances, are required to cover the remaining risks.

The main drivers of a PPA price are the capital expenditures (CAPEX) and operating expenditures (OPEX) (i.e., the actual cost of building and operating the power plant), the solar/wind resource (i.e., how much power can be generated), and the cost of capital (i.e., lenders and equity returns). The cost of capital will reflect the risks perceived by IPPs once their mitigants (such as targeted public support or risk mitigation instruments) are accounted for (see Figure 1).

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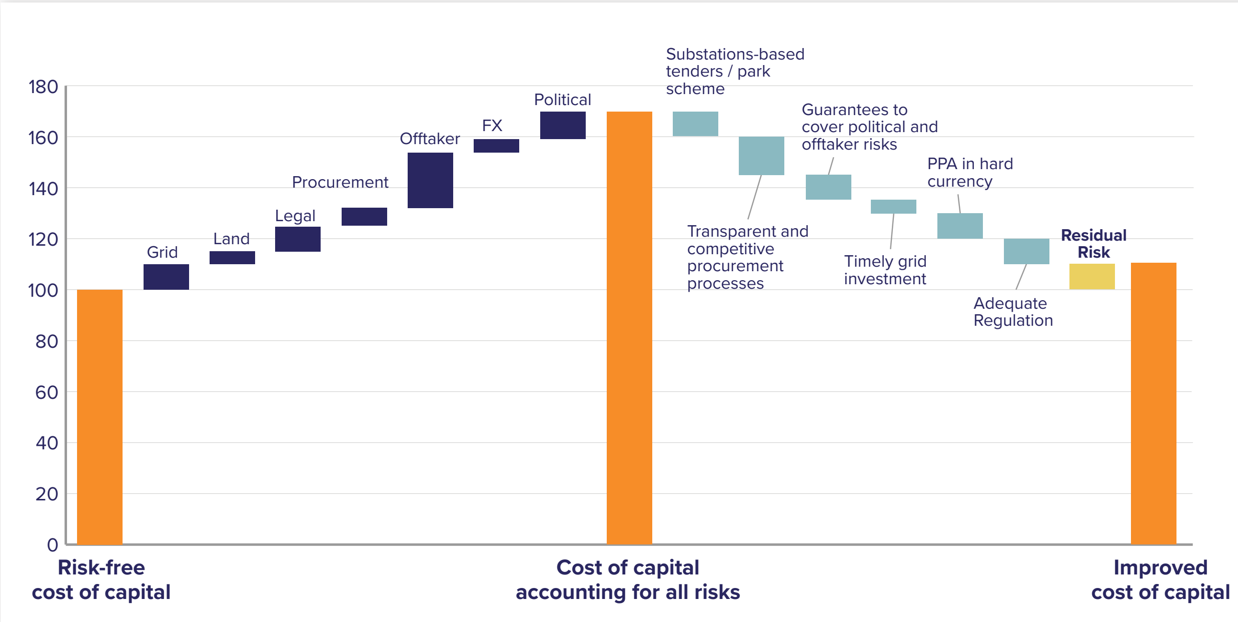
12 World Bank, 2019, SRMI: A Sure Path to Sustainable Solar.

FIGURE 1: ILLUSTRATIVE IMPACT ON THE COST OF CAPITAL OF OPERATIONAL AND DEVELOPMENT RISKS AND THEIR ASSOCIATED MITIGANTS



SOURCE: AUTHORS, 2023

2.2 WHY ARE PIPELINES OF BANKABLE PROJECTS SO SCARCE?

2.2.1 A SUCCESSFUL PILOT DOES NOT MAKE A PIPELINE

Category 3 countries[13], despite initiating a handful of successful pilot projects, may encounter difficulties in scaling up renewable energy deployment. Often, these countries were able to propose a bankable environment for one project or two but are not able to replicate the government support or mitigants at a broader program level. Additionally, there might be a limited willingness at the country level to actively promote renewable energy.

For instance, with the support of the World Bank Scaling Solar program and the Kreditanstalt für Wiederaufbau (KfW) GET FIT program, Zambia was able to attract IPPs to finance and operate medium size solar projects representing a total of 175 MWp. As these two programs were ringfencing the main project and country risks, it attracted many private investors. At the time of their procurement, these tenders led to some of the lowest PPA prices on the continent, between US$ 4 and 6 cents per kWh. Nevertheless, even with credit enhancement mechanisms tackling the payment risk[14], this risk is still perceived as high by IPPs as the utility creditworthiness did not improve in the recent years and the monthly payment for the electricity sold during the month often realized late or with difficulties. One of the key aspects for a project to be bankable, the "clear and stable revenue stream", is compromised when the utility is not creditworthy and the lack of evolution on the utility creditworthiness is discouraging additional IPP deployment in the country. Consequently, Zambia has been unable to sustain its plan for multiple tenders and is redirecting its focus toward enhancing the utility creditworthiness before launching additional tenders.

13 As per the introduction, Category 3 countries are those that successfully completed a few pilot projects but have not moved to the next phase of scaling up renewable energy deployment.

14 The payment risk refers to the potential uncertainty or concern regarding the timely and full payment for the electricity by the utility / the offtaker who purchases the power from the IPP, as per the PPA terms.

Indonesia faces a comparable situation with a few successful solar and wind projects but no substantial project pipeline. However, the underlying cause of this situation differs from that observed in Zambia. Indonesia has abundant domestic coal reserves and is yet to develop and implement a path to transition from a thermal-based energy mix to a renewable energy one. The lack of willingness to deploy solar and wind, perceived through the lack of renewable energy tenders launched in the recent years, is here driving the slow unfolding of VRE in the country. Even in regions where the solar resource is good and competitive with the other generation sources (diesel in most islands), VRE uptake is very slow. A key element in building a pipeline is the country's true willingness to have renewable energy deployment and translate it into tenders.

As the energy transition will require a significant scale up of renewable energy, the project-by-project approach will need to be abandoned by most EMDC. Instead, the focus will need to shift towards establishing an enabling environment to build bankable project pipelines as a more effective strategy.

2.2.2. MAIN BARRIERS TO THE PIPELINE DEPLOYMENT

To create the enabling environment mentioned above that will lower the level of the risks perceived by IPPs at the project level, several macro barriers need to be lifted.

- **Absence of a medium / long term vision and commitments**

  As per the Indonesia example, developing a bankable pipeline of renewable energy projects requires, among others, long-term commitments from the government that can be transcribed into actions at the offtaker level. Indeed, to be robust, the pipeline of projects needs to be outlined in a long-term generation plan endorsed by the government, the electric utility(ies) and/or offtakers. Without a strong signal, transitioning from a pilot phase to mainstream implementation will remain challenging for the country as private developers will not invest the necessary time and effort. In addition, the absence of a long-term vision can result in inadequate infrastructure-policy frameworks and suboptimal prioritization of grid reinforcement. These generation and transmission plans are usually not driven solely by climate ambitions but by the necessity to deliver reliable and affordable power services to the population. Around 90 percent of countries in SSA, the region with the least deployment of renewable energy, do not have an up-to-date comprehensive long-term generation plan.[15]

- **Inadequate or missing regulations**

  Due to the swift evolution of the energy sector and the prevalence of vertically integrated utilities or single buyer models in most EMDC, regulations concerning the involvement and competitive selection of private investors may be missing. In Vietnam, the Public Private Partnership (PPP) law and electricity regulations gives two options to the electric utility: organizing a feed-in-tariff (FIT) without indications of the grid availabilities or initiating a tender for a specific piece of land (i.e., solar park approach). These two options are considered sub-optimal given the characteristics of the Vietnamese sector. Efforts are underway to amend these laws and address this constraint. While some regulatory enhancements can coincide with the deployment of renewable energy, some regulatory provisions, namely private generation and tendering, must be established in the country before any significant progress can be made.

15 World Bank, 2019, SRMI: A Sure Path to Sustainable Solar.

- **Lack of competitive and transparent procurement processes**

  In the absence of competitive and transparent procurement processes, bilateral deals are the norm. Yet, bilateral negotiations for a single project between a private developer and the government/offtaker are not recommended as they usually lead to higher prices and lengthy negotiations timelines, in addition to the other usual challenge such as the risk of corruption. This is particularly true in countries with little existing renewable energy capacity where the price discovery process did not happen yet. In addition, the multiplication of bilateral deals may derail any efforts to have a pipeline of projects with multiple rounds of tenders.

- **Uncreditworthy utility**

  The creditworthiness of utilities, the so-called offtaker risk—encompassing the risk of non-payment or un-due termination of the contract—is a recurrent risk in EMDC where in the absence of markets, utilities are often the main, or even the sole, offtaker. In many EMDC, utilities face high generation costs, substantial commercial and technical losses, and tariffs that, while high, are not at cost-reflective level. Around 50 percent of the electric utilities in Asia and 75 percent in SSA are considered not creditworthy.[16] These utilities are often unable to make the necessary investment in the grid, and struggle to secure private investments at an affordable PPA price. Due to the low creditworthiness of the utility, fewer companies will be willing to invest, thereby reducing competition, including on price. Without a clear risk mitigant for the offtaker risk, investors and financiers will require higher rates of return and guarantees from governments or donors to compensate for the higher risks, or the projects will not materialize.

- **Insufficient and unreliable grid infrastructure**

  Another significant barrier that can be found across most countries relates to curtailment. To achieve countries' national energy and climate goals, the world's electricity use needs to grow 20 percent faster in the next decade than it did in the previous one.[17] Harnessing the potential of VRE necessitates substantial expansion and modernization of electrical grids, careful power system planning, and a grid management tailored to create enough flexibility to accommodate the unique attributes of VRE (variability and intermittency). Public investment in targeted technologies, such as battery storage, SCADA systems and voltage and frequency equipment, and promoting demand side management are essential to enable the grid integration of VRE.

  Since grid reinforcement investments are typically handled by the public sector in EMDC, it is commonly expected that the utilities will cover the curtailment risk. However, when this assumption does not hold true, the potential consequences for the project's financial sustainability are often deemed excessive for IPPs since it falls beyond their sphere of influence. For example, in Vietnam, the government promoted solar and wind generation through a FIT policy. However, this policy did not provide clear guidance to private investors as to where they should connect their power plants, resulting in an uncontrolled development of new solar and wind installations in areas where the grid could not integrate them. By 2021, after nearly 20 GW of VRE had reached commercial operation, almost 30 percent of the energy was curtailed. To mitigate the financial impact of this situation, the Vietnamese utility, EVN, required all IPPs to engage in a *take and pay* agreement, effectively transferring the curtailment risk to the IPPs. As a result, IPPs are not meeting their expected return on investment. It is understood that unless the Vietnamese government revises this practice, the deployment of VRE will be at a standstill for the foreseeable future.

16 World Bank, 2023, UPBEAT database

17 IEA, 2023, Electricity Grids and Secure Energy Transitions

BOX 2

NAVIGATING THE TRUE COST OF VRE INTEGRATION IN UNRELIABLE GRIDS

Emerging economies often face issues such as unreliable grid services, low levels of access to electricity, and important technical losses. In 2020, transmission and distribution technical losses averaged 15 percent across the African continent, nearly double the global average of 8 percent. Moreover, power outages occur at a frequency significantly higher than the global average (2.5 times more than the global average and 20 times more than OECD countries in 2020[1]). This prompts a surge in the adoption of backup power generation, and results in substantial direct and indirect expenses for both businesses and households.[2]

In the IEA Net Zero Scenario, it is expected that in EMDC the annual grid investment need increases to US$ 640 billion by early 2030. More than half of this increase is concentrated in PRC, with substantial investments also occurring in India, Southeast Asia, and Sub-Saharan Africa. The IEA attributes approximately 15 percent of this increase in investment requirements to the integration of VRE, while around 20 percent is allocated to the replacement and modernization of existing infrastructure, and the rest to meet the increasing power demand driven by economic growth, access and electrification of some end uses. This is consistent with the results of the World Bank Country Climate Development Reports (CCDR)[3] synthesis that evaluated that power system investment needs are often 20 to 30 percent higher in the decarbonization scenario than in the Business as Usual one.

It is essential to avoid attributing all grid reinforcement investment needs solely to VRE integration. Substantial grid investment is required today to improve the grid service reliability in many EMDC, whether or not VRE will be deployed. An analysis of the Ivory Coast system conducted in 2020, concluded that the grid could absorb 1,100 MW of solar by 2030 without requiring any grid upgrade specifically dedicated to VRE integration (in 2020 the installed capacity was around 2,230 MW). In Eastern Indonesia, a similar analysis conducted over 10 islands concluded that investment needs to improve the grid reliability were significant but that investments identified for the sole purpose of maintaining the grid quality while increasing VRE penetration only represented 6 percent of the total.[4]

1 World Bank Group, Doing Business project (http://www.doingbusiness.org/), Getting electricity, System average interruption frequency index (SAIFI)

2 World Bank, 2019, Lifelines: The Resilient Infrastructure Opportunity.

3 World Bank, 2022, Climate and Development: An Agenda for Action

4 Analyses conducted to support the design of World Bank projects.

In addition, the repercussions of the perceived and real curtailment risk could result in project development timelines being extended until the grid is strengthened. Such scenario occurred in South Africa and Senegal, where, despite successful tender processes, the expansion of solar power generation faced significant delays, spanning multiple years, due to grid constraints. In some cases, the curtailment risk might even lead to the project not progressing beyond planning stage. For instance, in Madagascar, a solar project under the World Bank's Scaling Solar initiative had to be cancelled due to the substantial curtailment risk stemming from the grid unreliability, and a new project including battery storage was proposed to the government.

- **Poor lending market and foreign exchange issues**

  Another barrier to the creation of pipelines of renewable energy projects is the cost of equity and debt – together the Weighted Average Cost of Capital (WACC). WACC for renewable energy projects tends to be significantly higher in EMDC than in advanced economies. For instance, in countries like Brazil, India, Indonesia, Mexico and South Africa, the WACC for solar projects reaching financial close in 2019 and 2021 ranged between 8.5 percent and 13.5 percent.[18] These values are two to three times higher than the average cost of capital in advanced economies and PRC.

  When local lending with the expected terms is not available, IPPs will turn to international markets, requiring the PPA currency to be in hard currency. This creates an FX risk as the utility's revenues are in local currency while the IPP will have to reimburse its debt in hard currency. The FX risk is said to be borne by the offtaker when the PPA is denominated in hard currency (i.e., the offtaker takes the risk of currency devaluation between its revenues to what it will pay the IPP), but by the IPP when the PPA is in domestic currency. For the latter, in the event of local currency depreciation against the hard currency, the hard currency debt service costs will increase in local currency terms. Hence, IPPs will request PPAs in hard currency. Other FX issues can occur related to transfer restrictions and convertibility, when hard currency is not available in the country.[19] PPAs should be signed in local currency when the domestic lending market is adequate (i.e., tenor, interest rate, non-recourse etc.). However, in most countries the local currency market is not mature enough and does not allow IPPs to access competitive financing which is why the FX risk is usually borne by the offtaker through PPAs pegged to hard currency.

  Rapid transformation in the lending market across most EMDC is not anticipated and the FX risk will persist. Therefore, most utilities and offtakers will likely need to continue proposing PPAs in hard currency in the foreseeable future. It could become a major risk for the energy transition and the viability of the utilities. This scenario could pose a significant risk to both the energy transition and the sustainability of utilities. Encouraging the growth of privately-owned generation must involve a broader discussion on lending markets to safeguard the transition from being derailed by FX risks.

A bankable project pipeline necessitates a comprehensive, long-term strategy that can withstand changes in political leadership to lift the barriers previously described. Governments must clearly articulate their energy transition ambitions and translate them into tangible, executable plans and targets for renewable energy and grid reinforcements. To implement these targets and leverage private financing, a clear procurement process with a sustainable risk allocation between the public and private sectors will be critical. Moreover, it requires a government with a certain level of capacity to facilitate the process and launch a well-structured tender with associated risk mitigation instruments. An assessment of the country specific project risks and pipeline creation barriers will be critical to ensure the development of the right government interventions.

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18 IEA and IFC, 2023, Scaling up private finance for clean energy in emerging and developing economies.

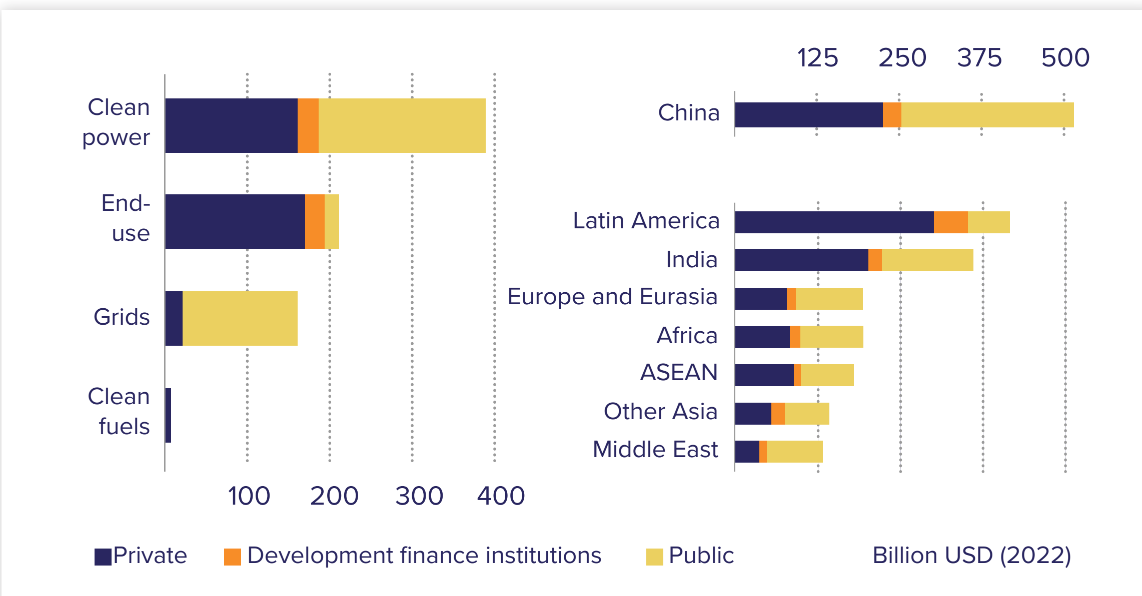
19 Matching of the capital expenditure cost with the debt currency can be covered with a one-time payment which is known at the moment of the construction just before reaching financial close. Long-term hedging for debt repayment is available only in the main currencies. New solutions are being developed for long-term hedging of other currencies such as TCX, however they are still costly, difficult to access and cannot cover large projects.

3. Governments' Role and Levers to Create a Pipeline

One might be tempted to believe that creating a pipeline of bankable projects solely requires a modest injection of public funding to trigger a multitude of transformative private sector development projects. Back in 2015, when the SDGs were adopted, the prevailing belief was that achieving these goals would depend on private capital funding and private sector implementation. The idea of the "*billions to trillions*" was to mobilize, redirect, and unlock trillions from private resources to drive global growth and foster shared prosperity with limited public funding. However, the reality has proven to be far more complex than that. This kind of leveraging has been largely absent in most EMDC, with a few exceptions, primarily seen in Latin America, in larger countries like India, and in specific sectors, and still, only to a limited extent.

The "*billions to trillions*" concept does not portray accurately the current landscape of renewable energy financing (Figure 2). Presently, in EMDC, public sector financing accounts for almost half of the investments in clean energy and it is not projected to change drastically over the next 30 years. This is not only true in EMDC but also in developed countries. Both Europe and the US are now allocating significant public resources to sustain the transition efforts, as evidenced by initiatives like the American *Inflation Reduction Act* and the *European Green Deal*. According to the IEA Net Zero Scenario, it is anticipated that by 2050, around 55 percent of the financing for clean energy investments will originate from the private sector. This differs from region to region with Latin America as a clear outlier, thanks to its developed power markets with high levels of renewable energy in particular hydropower.

FIGURE 2: CLEAN ENERGY FINANCE IN EMERGING MARKETS BY PUBLIC AND PRIVATE SOURCES IN 2022



SOURCE: IEA AND IFC, 2023

The fundamental question is how to effectively achieve the energy transition, while enhancing affordability and reducing poverty. As the energy transition will require more funding than public sources can offer, governments will need to implement a comprehensive set of interventions to attract investors by addressing risks and barriers with technical, legal and financial interventions. While private sector financing is undoubtedly essential for realizing the energy transition, it cannot operate in isolation from government and international public support.

BOX 3

HARNESSING SOCIO-ECONOMIC DEVELOPMENT AS THE CATALYST FOR RENEWABLE ENERGY ADOPTION

A just transition in the energy sector, one that leaves no one behind, plays a pivotal role in securing widespread societal approval for the profound changes the transition requires. Increasingly, the adoption of renewable energy is acknowledged as a significant opportunity that contributes to the diversification of a country's skill base, drives industrial development, and aligns with broader developmental objectives. According to the International Renewable Energy Agency (IRENA), the global renewable energy workforce was 13.7 million in 2022, up from 12.7 million in 2021. Nearly two-thirds of these jobs are situated in Asia, with PRC alone accounting for 41 percent of the global total. It is worth noting that current renewable energy employment is heavily concentrated in a relatively small number of countries, reflecting the uneven distribution of equipment manufacturing and capacity installations[1] and the market consolidation on the developers' side.

Under the SRMI initiative, the World Bank with its partners conducted a market sounding to gain deeper insights into the challenges and opportunities faced by both public and private sectors in enhancing socio-economic benefits. The findings confirmed that the obstacles governments encounter in harnessing socio-economic advantages stem not from private sector reluctance to engage on this agenda but rather from an unprepared domestic market, inadequate governmental planning, and a lack of coordination between governmental entities. The public sector must articulate its socio-economic objectives and, when doable, incorporate the appropriate incentives in the private developer selection process.[2]

1 IRENA, 2023, Renewable energy and jobs: Annual review.
2 World Bank, 2022, SRMI: Maximizing Socio-Economic Benefits Triggered by Renewables.

3.1 GOVERNMENT WILLINGNESS AND OWNERSHIP IS CRITICAL IN SHAPING AND DRIVING THE ENERGY TRANSITION

A successful implementation of the energy transition will necessitate a systemic shift from the highest levels of government down to the technical experts, and such shift will need to withstand changes in governments. This is a lengthy process that will, in many cases, extend across several administrations and encounter challenges in the form of, for example, vested economic interests. Simply launching a procurement to select private investors will not yield the desired results unless the government fully embraces a long-term vision for the country's future and exhibits resolute leadership. Even with the appropriate instruments and concessional20 funding in place, countries cannot be coerced into embarking on the energy transition, initiate tenders for renewable energy projects, or discontinue their fossil fuel production. Some countries, like Algeria or Indonesia, have less incentives than others to accelerate the transition, as a significant portion of their economies relies on the production, domestic use, and exportation of fossil fuels and vested interests usually delay the transition. In Indonesia, despite substantial international political backing from initiatives like the Just Energy Transition Partnership (JET P), domestic realities significantly shape the readiness and willingness to decarbonize the energy sector. A disruption or catalyst may be necessary to kick-start a faster transition in these countries.

Governments must establish comprehensive and sustainable regulatory frameworks with clear responsibilities for given institution in charge of renewable energy deployment, while ensuring that early results serve near-term imperatives such as energy security, energy affordability, and job creation. This is a political imperative to ensure the support and further endorsement of the constituents. Striking a balance between transition objectives and short-term development needs is essential to ensure a widespread adoption of the ambitions. Achieving this balance is likely to enhance long-term political commitments to sustaining and deepening the transition.

3.2 GOVERNMENT'S INTERVENTIONS TO TACKLE BARRIERS TO PRIVATE INVESTMENT MOBILIZATION

- **Long term plans and commitments to reduce uncertainty**

  In addition to government-endorsed long-term climate plans, such as the Nationally Determined Contributions, governments/utility need to have a generation and transmission plan with a comprehensive list of renewable energy investments derived from technical analyses, like VRE integration analyses. The plan needs to include clear public funding allocations for all investments that will need to be financed by the government, in particular for grid reinforcements. The list of new generation projects should include a clear timeline for initiating competitive processes to select the IPPs and it needs to be endorsed and effectively communicated on. A comprehensive long-term generation plan spans political cycles and sends a clear signal to investors that investing in understanding the country's unique conditions benefits not only a single project but a pipeline of projects over a few years. Indeed, preparing a well-defined, multi-year plan provides confidence to IPPs and enables them to strategically plan their investments in the country. It also allows investors to get a sense of the future renewable energy market size and of the timing of its deployment. Consistency and predictability are critical aspects for IPPs.

20 The degree of concessionality of a given financing can be measured by its grant element, so that the financing cost is below market price.

- **Comprehensive policies**

  A stable regulatory framework, with the adequate parameters, is a key determinant of how much private capital could be mobilized for a country's energy sector. Two main regulatory aspects need to be in place in the country: a regulation that would allow IPPs to own generation and distribution assets and for the utility/offtaker to be allowed to launch a competitive tender. Specific bidding mechanisms might necessitate an official decree or decision from a ministry or the president, especially when public funding is allocated under PPP. In addition, a comprehensive legal framework should cover, among others:

  - The roles and responsibilities of the public entities in the energy sector, including the state utility, ministries of energy and finance, and the regulator, creating ownership and accountability;
  - The establishment of effective dispute-resolution mechanisms at all stages of the tender and the during operational stage;
  - Streamlined permitting processes;
  - Suitable FX regulations (including availability at the central bank, repatriation etc.); and
  - Clear tax provisions applicable to renewable energy.[21]

As legal stability and visibility is key to foster investor confidence, government support in the case of *change in law* during project operation is necessary to mitigate legal and tax changes beyond the control of IPPs. Concretely, governments can attach a letter of support to the PPA, committing that any *change in law* that would negatively impact the project's operation and profitability would not be applicable. Similarly, governments can agree to *international arbitration* to provide further assurance to lenders and IPPs in the event of termination or breach of contract. This is particularly important in countries where the judicial system does not meet international standards.

Another category of policies that may be counter-productive are those focusing on local content. Even if localized socio-economic benefits are a requirement for a successful energy transition, developing a fair local content regulation, that engages local industries capable to perform the requested tasks, but that will not increase the final PPA price and hence the cost of electricity in the country, is not an easy task. Localizing renewable energy supply chains in EMDC is being done in some countries but it is a long-term endeavor and local content requirement should be tailored to the country context to ensure that it will be realistic and will not delay the transition.

- **Transparent tenders**

  Consistent, transparent and competitive procurement processes reduce, among others, the procurement and corruption risks and thus contributes to lower tariffs. Tenders should be rooted in sound legal grounds and in comprehensive generation plans alongside VRE integration analyses. To ensure the successful completion of a tender, it is essential to limit or stall bilateral deals. Running parallel procurement processes could convey a misleading message to investors and weaken the government's commitment to the initiative. As part of the tender process, bankable contracts, including the PPA, are a core requirement.

21 World Bank, 2022, SRMI: A Sure Path to Sustainable Solar, Wind and Geothermal.

- **Mitigating the utility creditworthiness risk**

  While tackling the fundamentals of the energy sector – fossil fuel subsidies, energy losses, high cost of generation, market creation, etc., specific actions can be undertaken simultaneously to lower the risks perceived by the private sector, particularly by implementing project-specific risk mitigation measures.

  Under a project finance scheme with limited recourse or non-recourse to shareholders[22], the bankability of a renewable energy project is based on the capacity of the project to reimburse the loan, and hence on the capacity of the offtaker to make the monthly payments to the IPP. As most utilities are not creditworthy, government backing the obligations of the utility/offtaker under the PPA with a bankable letter of support is often a key element of a successful tender. This support needs to be agreed upon by the government prior to procurement. In addition, political risks can be mitigated by inserting, in the contractual documentation, a termination clause benefiting the IPP in case of *force majeure*. It would also present specific indemnities covering the IPP's outstanding debt repayment obligations.

  The risk of payment delays can be mitigated by credit enhancement mechanisms to secure payments and/or by a sovereign or a Development Finance Institution (DFI) guarantee. Similarly, termination and breach of contract risks (i.e., arbitral award default, denial-of-recourse risk with arbitration that is not international) arising from utility default can be lessened through provisions for termination payment and/or by a guarantee or a political insurance such as MIGA's Political Risk Insurance (PRI). Additional political risks perceived by IPPs, like expropriation, transfer restriction and currency inconvertibility, and war and civil disturbance, can also be covered by guarantees and insurances. Different instruments can be combined to cover the different offtaker perceived risks.

- **Grid preparedness and deployment scheme selection**

  Governments and utilities can address the curtailment risk through three types of interventions:

  - **Selection of the deployment scheme**: If the main risk is related to grid capacity, it is recommended to promote a *substation-based tender* where a group of substations with available hosting capacity are identified, and bidding is opened for that capacity at each substation. This type of tender minimizes the risk of curtailment. In addition, if issues with land ownership/titling or availability – such as in SIDS – arise, a *park approach* is optimal. Under such approach, the government/utilities identify the site(s), conducts land clearance, and in some cases, finances and constructs infrastructure for the park that can range from the evacuation line to basic elements (such as the fence, roads, street lighting, etc.). The selected IPP is responsible for the financing, construction, and operation of the power plant. This approach efficiently addresses risks associated with land, grid connections as the utility selects the connection point, and resource uncertainty, especially in the case of geothermal projects as the resource is not known until significant upfront costs have been made. When executed in a timely manner and in alignment with industry best practices, public investments in renewable energy parks provides visibility to IPPs and results in cost reductions and faster project development. However, there could be risks in promoting the *park approach* as the publicly developed shared infrastructure have a risk of being delayed. The experience of the Lake Turkana wind project in Kenya is telling: in 2017, the

22 Non-recourse finance is a type of commercial lending that entitles the lender to repayment only from the profits of the project the loan is funding and not from any other assets of the borrower.

IPP-owned wind farm project was completed and ready to begin injection onto the grid, but the construction of the transmission line necessary to evacuate the power to the national grid was only completed by the government mid-2019.[23]

- **Financing of grid reinforcements**: It is critical for the government and/or the utilities to finance the grid reinforcements identified during the planning process. Yet, grid investments are usually lagging as demonstrated by the fact that at a global scale, around 3,000 GW of renewable power projects, with 1,500 GW in advanced development stages, are currently queuing for grid connections.[24] Global investments in grid development, around US$ 300 billion per year, have remained stagnant over the past decade when it needs to drastically increase. And such not only in EMDC but also in developed countries. Governments and utilities are instrumental in expediting grid expansion and battery storage deployment to support the deployment of clean energy generation. These investments need to be prioritized.
- **Risk allocation translated in the PPA**: since grid reinforcement investments are typically the responsibility of the public sector in EMDC, it is commonly expected that the offtaker will take the risk of curtailment. This risk allocation is typically formalized through a "*take or pay*" arrangement as an integral part of the PPA.

- **Improving the domestic lending market**

To avoid the FX problem, the main mitigant is a strong domestic currency market where IPPs can access local currency debt with the adequate terms and hence, sign a PPA in local currency. Some EMDC have successfully developed a domestic infrastructure market such as Thailand that has one of the most competitive non-recourse finance debt market or India where PPAs are now signed solely in Indian rupees. In India, the emergence of competitive local players in the solar market, replacing international IPPs and EPC companies, supported the development of the domestic lending market. Yet, this is a long-term endeavor that need to be carefully planned. A partial indexation of the PPA payments (e.g., 30/70 between local currency and hard currency) is a good way to promote local currency debt and create a market for infrastructure financing while not moving directly to a full payment in local currency. The Philippines has promoted this approach, allowing for local banks to partner with international banks and to build their non-recourse financing capacity.

However, in most EMDC the lending market is not expected to transform fast enough, and the FX risk will persist. Therefore, most utilities will have to propose PPAs in hard currency in the foreseeable future. It could become a major risk for the energy transition and the viability of the utilities. The development of privately-owned generation will have to come with a larger discussion on lending markets to ensure that the FX risk is not derailing the transition.

23 https://www.wilsoncenter.org/blog-post/public-private-partnerships-in-africa-some-lessons-from-kenyas-lake-turkana-wind-power-project

24 IEA, 2023, Electricity grids and secure energy transitions.

BOX 4

BURKINA FASO, TACKLING ALL BARRIERS TO BUILD A PIPELINE OF BANKABLE SOLAR PROJECTS

Burkina Faso is a fragile, landlocked country with a power sector that went from being solely diesel and heavy fuel oil (HFO) based to a more diverse mix with solar generation, battery storage and imports from neighboring countries, allowing to reduce drastically fossil fuel consumption. This led to a division by two of the cost of generation. With the support of the World Bank, the French Development Agency (AFD) and the African Development Bank (AfDB), the Government of Burkina Faso tackled the different risks and barriers to attract private investments in the country by:

a. developing a new Master Plan with renewable energy targets tackling the planning risk;

b. developing comprehensive policies allowing IPPs to enter the market through a new PPP law tackling the legal risk;

c. borrowing from MDBs and climate financiers (the Clean Investment Fund (CIF) in particular) for grid reinforcements and publicly-owned battery storage tackling the curtailment risk;

d. hiring transaction advisors to launch a competitive tender for solar and battery storage tackling the perceived risk of corruption;

e. providing to IPPs a site and grid connection under a Solar Parks scheme, mobilizing World Bank financing, tackling the land, grid and security risks;

f. proposing to IPPs credit enhancement mechanisms for liquidity and termination risks, and PRI for political risk; and

g. proposing a PPA in local currency (XOF) but indexed to EUR.

With these different targeted government interventions with support from MDBs, Burkina Faso is moving from a pilot phase with a few solar projects, to a full mainstreaming of competitively procured IPP-owned renewable energy.

3.3 SUBSIDIZING SUSTAINABILITY TO UNLOCK THE PIPELINE

Subsidies have long been a familiar component within the power sector. US$ 200 billion per year in the past decade has been spent for global fossil fuel consumption subsidies, peaking in 2022 at US$ 400 billion.[25] While subsidies are often criticized because they can create market distortions and because of their lack of sustainability over time, they remain essential in some cases. They are specifically relevant in EMDC where perfect market conditions are still a long way down the road and where subsidies can be used to correct market failures and to level the playing field with fossil alternatives.

Subsidizing renewable energy deployment can be justified when it makes high-impact development investments financially viable. Renewable energy subsidies could act as a strong enabler in different contexts, setting the power sector on the recovery path for countries with very high generation costs (section 3.3.1), and facilitating the energy transition in coal and gas dominated power systems and economies (section 3.3.2). These subsidies are inherently temporary and intended to phase out upon completion of the transition.

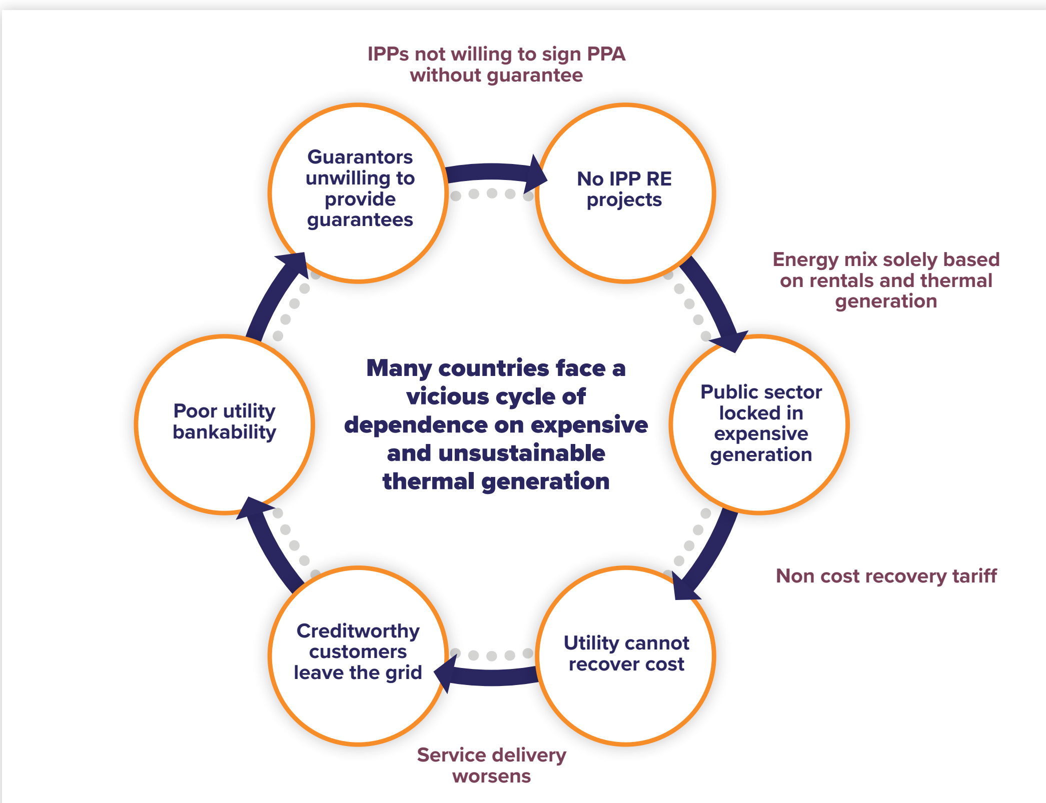
25 IEA, 2023, Fossil Fuels Consumption Subsidies 2022.

3.3.1 RENEWABLES TO BREAK THE VICIOUS CYCLE OF HIGH GENERATION COSTS AND UNCREDITWORTHY UTILITIES

Multiple countries, particularly in Sub-Saharan Africa, are facing significant operational inefficiencies, inefficient power plants, and an overreliance on costly HFO and diesel-based electricity generation usually based on imported fuels. These factors create a self-reinforcing cycle as they have led to increased power supply expenses, not always reflected in the customer tariff. In addition, due to the poor quality of service, anchor load customers, such as industries and mines, tend to power their facilities through off-grid generators (see Figure 3). Losing such creditworthy customers impacts the revenues of the utility. As a result, a lot of utilities encounter growing challenges in breaking the vicious cycle of expensive power, leading to poor services, loss of creditworthy clients, and worsening of the financial viability of the utility. These difficulties have been aggravated by years of insufficient investment in the maintenance and expansion of the system.

In the absence of the implementation of a comprehensive, long-term optimization strategy and a cost-effective development plan for the entire sector, the energy generation mix may not be efficient, relying excessively on costly generation. Achieving an optimized generation mix, coupled with cross-border energy trade, when possible, necessitates substantial CAPEX and may take several years before new power plants and the associated transmission and distribution infrastructure are commissioned. Emergency generation like diesel rentals are quite common for some of these countries, worsening the state of their finances. Initially deployed for the short-term, these expensive diesel rentals remain in place for years (sometimes over decades), inhibiting the financial improvement of the sector such as in The Gambia and Guinea-Bissau.

FIGURE 3: VICIOUS CYCLE OF DEPENDENCE ON EXPENSIVE POWER GENERATION

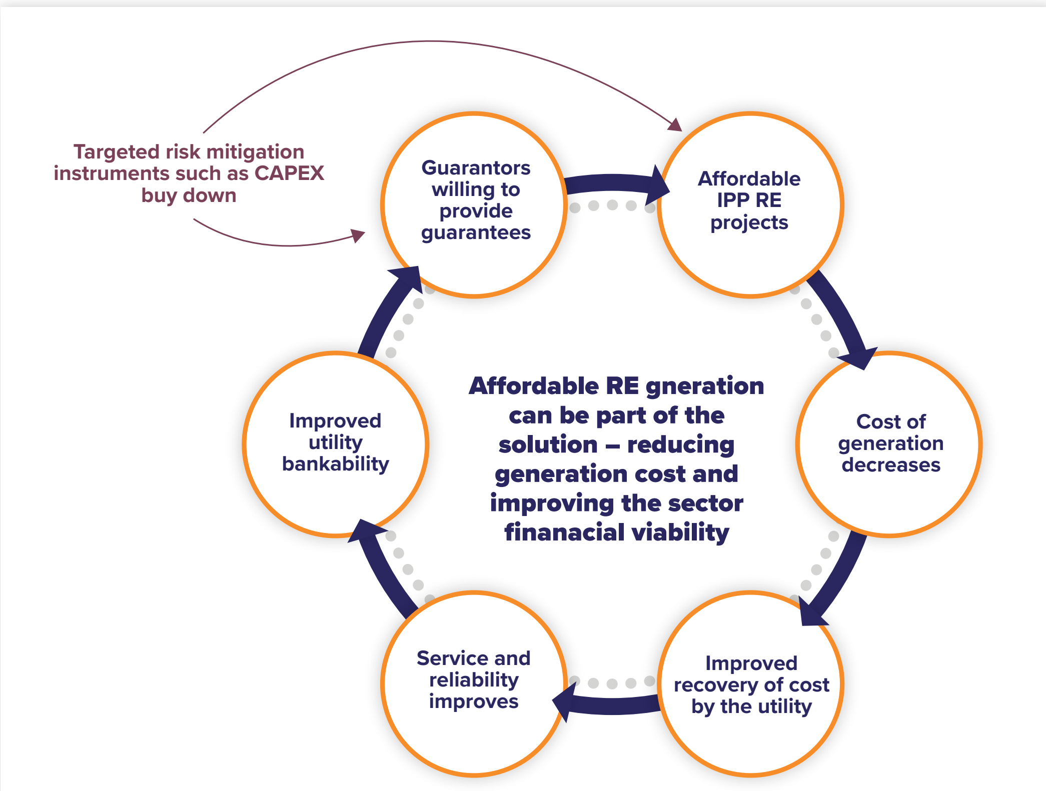


SOURCE: AUTHORS, 2023

In the case where the utility faces financial stability issues, reaching an economically viable PPA price might prove unfeasible in the absence of financial engineering. While the cost of a solar kWh may be significantly lower than that of a diesel-generated kWh, private sector investors might be hesitant to invest in a solar project unless there is an investment grade guarantee (either sovereign or from a DFI), or a more favorable risk allocation in place. The core challenge here is that most guarantors are hesitant to offer a guarantee if they anticipate that it will inevitably be called in the near term. Indeed, the utility might find challenging to pay the PPA, mainly due to the utility's lack of liquidity, even if it is lower than the cost of diesel-generated energy. This is particularly true if the PPA price is above the utility's operating cost. Consequently, the cheaper solar projects would not materialize, and these utilities would remain bound to more expensive diesel-based generation, which they can only pay for intermittently, further compromising the reliability of their services.

In practice, a substantial portion of private financing and MDB/climate financing tends to flow towards middle-income countries with comparatively lower risk profiles. In contrast, the poorest and most vulnerable country often face severe energy supply deficits, with large parts of their populations without access to modern electricity, and considerable barriers to securing funding for clean energy projects. Therefore, it is crucial to bolster the deployment of more cost-effective generation through large amounts of grants and lower cost of financing sourced from donors and MDBs. Indeed, in these countries, subsidies may serve as a powerful driver to disrupt and break

FIGURE 4: POSITIVE CYCLE STARTING FROM SUBSIDIZED RENEWABLE ENERGY



SOURCE: AUTHORS, 2023

this cycle. For instance, mechanisms like a Viability Gap Funding (VGF) grant, whether through a CAPEX or a tariff buy-down, can guarantee that the PPA price remains sustainable for the utility. This not only diminishes the perceived risk for IPPs but would also attract a sufficient number of IPPs, promoting healthy competition that, in turn, ensures competitive PPA pricing. This grant funding can be channeled through different means: park infrastructure (with the potential risk presented in section 3.2), direct CAPEX subsidy, or as tariff subsidy.

Affordable renewable energy can be part of the solution to break the vicious cycle of expensive power which deteriorates the country's ability to develop, and to reduce poverty (Figure 4). To sustainably break this vicious cycle, additional measures will need to be implemented to, for example, reduce grid and collection losses.

BOX 5

MALDIVES, LEVERAGING RISK MITIGATION INSTRUMENTS TO ACCELERATE SOLAR DEPLOYMENT

Maldives is a SIDS with a small and expensive diesel-based grid. Following the SRMI approach[1] and with the support of the World Bank Energy Storage Partnership, the Government of Maldives has been engaged with the World Bank to (i) develop large scale solar, including floating solar, to attract private investors in optimized conditions, (ii) enable further VRE integration through public and privately-owned battery storage deployment and grid modernization – via co-investments with the Asian Development Bank (ADB); and (iii) provide technical assistance for institutional capacity building.

The risk mitigation framework developed for the Maldives, with support from SRMI, has helped provide the confidence needed for private sector companies to invest in the country's renewable energy sector. It resulted in a significant increase in private sector participation from four bidders to a whopping 63 parties for the 11 MW solar PV project which was awarded at a tariff of US$c 9.8 per kWh, a record-low bid in Maldives and one of the lowest in a SIDS country.

Under this framework, the risk mitigation instruments proposed to IPPs are:

a. World Bank guarantees for PPA termination risk;
b. 6 months payment security mechanism for PPA payment delays, co-funded by CIF and the Government of Maldives;
c. Currency convertibility clause; and
d. Tariff buy-down focusing specifically on floating PV and battery storage.

1 Further presented in Section 4.

3.3.2 SUPPORTING RENEWABLE ENERGY TO ACCELERATE THERMAL PHASE OUT

In countries with carbon intensive power systems, notably in coal producing countries, moving to a high portion of renewable energy in the energy mix will be extremely challenging. These countries often have moderate to low generation cost—sometimes because of coal subsidies—creating less incentives to move towards clean energy technologies. Even when there is a clear economic case to deploy renewables, vested interests and existing commercial arrangements with the incumbent thermal IPPs can hinder the entry of cleaner options. In addition, phasing out coal will have strong socio-economic impacts in coal-producing regions where a high percentage of jobs are related to the coal industry, and its social acceptability will not be guaranteed.

BOX 6

COAL PHASE DOWN

Scaling-up renewable energy is critical as it will be needed to fill the gap left by the declining coal generation capacity as it is gradually phased out. However, scaling down coal is challenging. To date, there are no scalable solutions to support coal-dependent countries to plan for the early closure or repurposing of their coal-fired power plants while preserving their energy security.

Demonstration projects and targeted mechanisms are being piloted. For example, in 2021, ADB launched the Energy Transition Mechanism (ETM), which proposes to leverage concessional and commercial capital to accelerate the retirement or repurposing of fossil fuel power plants.[1] ADB's work on ETM promotes a just energy transition, protecting the livelihoods of workers and communities affected by the transition. ETM began with three pilot countries, Indonesia, the Philippines, and Vietnam, and has now extended to pre-feasibility studies in Pakistan and Kazakhstan. It is exploring in Indonesia, the early retirement of a 660 MW coal power plant, leveraging concessional funds to reduce the cost of the transition. In South Africa, the World Bank, with the financial support of the Canadian government, is piloting the decommissioning and repurposing of the Komati coal power plant using renewable energy and batteries. It will serve as a demonstration project that aims to serve as a reference on how to phase down fossil fuel assets.[2]

1 https://www.adb.org/what-we-do/energy-transition-mechanism-etm

2 https://www.worldbank.org/en/news/press-release/2022/11/04/world-bank-approves-497-million-in-financing-to-lower-south-africa-s-greenhouse-gas-emissions-and-support-a-just-transit

In coal-based power systems, the utility is usually reluctant to deploy variable sources of energy as the grid is less flexible due to coal power plants, leading to concerns for the grid stability if large VRE plants were to be deployed. This comes in addition to the general problem of poor grid reliability seen in most EMDCs, where integrating VRE without the necessary grid investment and capacity building for the dispatch engineers and planners is challenging.

A full package of measures and tools will be needed in countries with high shares of thermal capacity to support the energy transition. For example, under the JET P, several countries among which South Africa, Indonesia and Vietnam, are designing investment plans necessary to support coal phase out while also identifying the policy and regulatory changes necessary to support the transition. Furthermore, this partnership encompasses institutional reforms, workforce transition and skill enhancement, efforts to promote social equity and inclusion, all of which must be adequately funded to ensure a sustainable and equitable transition. However, the recipient countries have remained skeptical about the structure of the support provided in the JET P so far, as it remains primarily in the form of commercial loans. This is what the President of Indonesia has, for example, formulated at the G7 in May 2023, asking for more grants from developed countries to support developing countries' energy transition.[26] Hence, if the international community sees the need for these large coal-based economies to transition to renewables, more concessional financing is needed to ensure that renewable energy will be more attractive than fossil fuel.

Financial incentives are necessary to ensure that investments in renewable energy are a cost-efficient choice and to avoid stranded assets in the long term. In Tajikistan, for example, a financial support through a CAPEX buy-down is being discussed to reduce the expected cost of solar generation to ensure that a new coal plant would not get build. Indeed, the government was contemplating an investment in a coal-fired power plant to meet the nation's energy needs during the winter months when hydropower generation is reduced due to lower water availability. Through the implementation of a CAPEX buy-down mechanism, solar generation emerges as a competitive alternative to coal. This not only ensures cost-efficiency but also prevents entrenching the power sector in an unsustainable trajectory.

For coal and gas producing countries, grants to reduce the cost of renewable energy may be required to provide the necessary financial incentives to set the country on the energy transition pathway. It would demonstrate to the utility that renewable energy is a viable option and that integration challenges are not unmanageable. In addition, it reduces the investments in new thermal generation capacity that could become stranded in the near-term.

26 https://nasional-kontan-co-id.translate.goog/news/jokowi-ingin-dukungan-pendanaan-iklim-bagi-negara-berkembang-bukan-berupa-utang?_x_tr_sl=id&_x_tr_tl=en&_x_tr_hl=fr&_x_tr_pto=wapp

4. How can Multilateral Development Banks Support Governments in their Transition Efforts?

As presented in Section 2.2, having a successful pilot does not make a sustainable pipeline. Hence, climate finance should not be used to overcome a barrier for one project, but to reduce the barrier for the project and the ones that follow. The only way to achieve scale is to use targeted concessionality to create the pipeline and, in some countries, to support utilities on their path to creditworthiness. MDBs and development partners have a key role to play by providing the appropriate instruments with the right concessionality.

4.1 FOSTERING COLLABORATIONS TO ACCELERATE RENEWABLE ENERGY DEPLOYMENT

Concessional and blended financing as well as targeted MDB and bilateral development institutions' instruments can be leveraged to mitigate risks for private investments and tackle market failures at the country, sectoral, and project levels. Governments can work with development partners to advance crucial policy and utility reforms, invest in network reliability, and de-risk renewable energy projects using appropriate risk mitigation instruments.[27]

The scale of ambition and the complexities associated with the energy transition necessitate collaboration among various stakeholders, including MDBs, DFIs and bilateral development institutions, to collectively offer a comprehensive support package to governments. SRMI is an example of such collaboration (see Box 6). A good example of the SRMI support encompassing technical assistance, public investments, and risk mitigation instruments in a given country is Uzbekistan. The government of Uzbekistan has outlined a clear vision to embark on the energy transition and has sought assistance from MDBs to implement the SRMI approach. SRMI supported the country's clean energy transition through World Bank and EBRD technical assistance programs and investments. Specifically, these MDBs have provided technical assistance to support the government in developing a least-cost generation plan and a strategy to deploy privately-financed renewable energy. Through the World Bank Scaling Program and the EBRD competitive tender program, Uzbekistan's government has launched one of the most competitive and bankable solar and wind programs in the region. With regards to grid reinforcements to support the penetration of VRE, the World Bank approved in 2021 the Electricity Sector Transformation and Resilient Transmission Project that blends US$ 380 million in World Bank financing and US$ 47 million in Green Climate Fund (GCF) financing.[28] This public investment aims at improving the transmission network's capacity to integrate over 1.5 GW of competitively procured solar and wind generation. The World Bank and the ADB also provided guarantee products to cover the offtaker risk. Together, these targeted instruments have led to a successful transition in a coal-producing country. This case underscores the importance of a comprehensive support package in facilitating such transitions.

27 World Bank, 2022, Scaling up to phase down.

28 The GCF financing allocated for Uzbekistan is part of the US$ 280 million SRMI-1 program for seven countries approved by the GCF in March 2021. https://www.greenclimate.fund/project/fp163

BOX 7

THE SUSTAINABLE RENEWABLES RISK MITIGATION INITIATIVE

Launched in 2018, SRMI is a partnership between the World Bank's Energy Sector Management Assistance Program (ESMAP) , AfDB, ADB, AFD, the European Bank for Reconstruction and Development (EBRD), IRENA, the International Solar Alliance (ISA), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) via its GET.transform program, and Sustainable Energy for All (SE4all).

SRMI's objective is to support countries build a pipeline of bankable renewable energy projects leveraging private investment while maximizing socioeconomic benefits. To unlock this pipeline, the Partners developed a comprehensive methodology from the government's perspective. The methodology includes a series of important steps to deflate the critical risks perceived by the private sector while minimizing the cost for the public sector. SRMI leverages the expertise of its different Partners to provide (i) upstream technical assistance focusing on creating an enabling environment through generation planning, VRE integration and setting the appropriate regulatory framework, (ii) downstream technical assistance to support the procurement of private investors (funding transaction advisors, feasibility studies etc.), (iii) targeted funding for public investments in battery storage and grid reinforcement, and (iv) innovative risk mitigation instruments to cover the residual risks perceived by private investors (Figure 5).

FIGURE 5: SRMI'S COMPREHENSIVE SUPPORT TO UNLOCK PRIVATELY-FINANCED RENEWABLE ENERGY PROJECTS

SOURCE: AUTHORS, 2023

4.2 REDUCING THE COST OF DEBT

While MDBs public sector arms can support governments to finance critical public infrastructure, such as grid reinforcements, and work on improving the energy sector's viability, another critical piece in the final price tag of the energy transition is the cost of equity and debt. The equity providers' perceived risk may be reduced thanks to the work completed under the MDB public sector support, but the development of strong domestic lending markets takes time and international financing play an important role in reducing the WACC of renewable energy projects.

In particular, International Financial Institutions (IFIs) can reduce further the cost of debt when international lenders are reluctant to enter a country or if their cost is too high. IFIs have the capacity to reduce the WACC through various mechanisms: concessional loans, longer tenures, or catalytic role as co-investors. Their involvement can provide a seal of approval that reduces perceived risk, encourages other investors to participate, and often leads to better financing terms. In Uzbekistan, alongside the comprehensive MDB support, IPPs of the solar and wind projects were able to secure debt from International Finance Corporation (IFC – World Bank's private sector arm)[29], EBRD[30] and ADB[31] private sector arm. The cost of the debt played a pivotal role in achieving these extremely competitive PPA price (at US$c 1.8 per kWh), effectively locking in low energy prices for a duration of 25 years, making the energy transition an economically viable option for Uzbekistan. Another example of how IFIs can unlock affordable renewable energy under innovative structures is the 600 MW wind project in Laos People's Democratic Republic. ADB private sector arm provided non-recourse project financing, under the largest syndicated renewable energy transaction in South-East Asia, to finance this project and supported the bankability of the structure to export the power to neighboring Vietnam.

The IEA has estimated that reducing the cost of capital by 2 percentage points relative to their baseline assumption would reduce the total clean energy investment bill (including financing costs) to reach net zero emissions in EMDC by a cumulative US$ 2 trillion over the period to 2035.[32]

4.3 LEVERAGING FINANCIAL INNOVATIONS TO COVER RESIDUAL RISKS

Technical assistance, targeted public investments and existing risk mitigation instruments cover most of the risks and barriers faced by IPPs. However, there is often a residual risk as existing risk mitigation instruments are not always adequate.

4.3.1 RESIDUAL RISKS

Sometimes, existing instruments can be sub-optimal. For example, the project or country size can make credit enhancement mechanisms unfeasible for IPPs, as the expenses may outweigh the actual cost of the guarantee.[33] Or available mechanisms for FX risk may not be suitable, limited to major currencies, short-term, and expensive for larger transactions. Another example is when high perceived political risk or government reluctance may deter guarantors from providing guarantees.

Furthermore, new risks are emerging that existing instruments fail to address. In addition to those presented in Section 3.3 related to the offtaker financial sustainability and the risk of renewable

29 https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=27162

30 https://www.ebrd.com/news/2023/ebrd-finances-landmark-wind-project-in-western-uzbekistan.html

31 https://www.adb.org/news/adb-masdar-unlock-uzbekistan-s-renewable-power-potential-3-new-solar-power-plants

32 IEA and IFC, 2023, Scaling up private finance for clean energy in emerging and developing economies.

33 For a 15 MWp solar project, when taking an average PPA price of US$ 5c per kWh, a liquidity risk instrument for 6 months payments corresponds to around US$ 500,000.

energy not being the cost-effective choice, these new risks include for example:

a. Availability of hard currency at the Central Bank: Risks related to convertibility issues are adequately addressed by current instruments. However, the risk concerning the actual availability of US$ within the country remains unmitigated. For instance, this issue is prevalent in Ethiopia, where the limited availability of hard currency hinders numerous renewable energy projects from achieving financial closure.

b. Innovation risk: To leapfrog and/or cope with specific issues, EMDC will have to innovate at a faster pace than developed ones. This is the case of SIDS where the resilience challenges mean higher investment needs and innovation in the way of planning and designing power systems. Similarly, many utilities are perceiving major risks in investing in battery storage, and most prefer covering their risk of VRE integration with gas peakers or diesel plants.

4.3.2. INNOVATIVE SOLUTIONS AND NEW INSTRUMENTS

By leveraging donor and climate funds, MDBs can develop instruments to cover these residual risks and ensure that barriers preventing projects from reaching financial closure would be lifted. A few examples are presented below based on the identified residual risks.

With regards to the offtaker risk, this assistance can be structured through established park approaches, CAPEX or tariff buy-down mechanisms. It is especially relevant in scenarios where thermal options prove more cost-effective than renewables and where the utility cannot afford the PPA price (see Section 3.3). In addition, climate guarantees can provide credit enhancement mechanisms that do not require an indemnity agreement such as the support to Namibia and Botswana via the SRMI-1 GCF program – but accessing these instruments can be highly complex and time consuming. Grants/donor funds can also be used to structure credit enhancement mechanisms for payment risks, acting as a revolving fund providing the needed liquidity to the offtaker to pay the IPP.

BOX 8

SRMI FINANCIAL INNOVATION WINDOW

With the Financial Innovation Window hosted under the World Bank ESMAP Trust Fund, SRMI aims to unlock IPP-owned VRE investments in countries by structuring tailored risk mitigation instruments and financing support to spur innovation. The Window aims to provide an agile way to address these risks by providing grant financing easily and timely accessible when projects are reaching financial closure.

The main categories of the US$ 500 million window are:

1. Risk Mitigation Instruments: new credit enhancement mechanisms to answer the residual risks perceived by private investors (such as liquidity guarantee for payment risk, tariff buy-down, FX instruments, and demand risk for mini-grid instruments), having enough flexibility to create innovative instruments when new risks arise;
2. Battery Storage: To target the innovation risk, increase penetration of VRE and reduce the risk perceived by most countries in new battery storage technologies, provide CAPEX buy-down for battery storage equipment to Governments and utilities; and
3. SIDS: Specifically provide resilience and adaptation financial support to SIDS for their energy transition, tailoring to the SIDS needs the first two categories (risk mitigation instruments and battery).

To address risks related to a country's limited availability of hard currency, this support can take the form of a revolving fund hosted at the Central Bank with the sole purpose to allow the IPPs to tap into that fund when US dollars are not available. Ethiopia is poised to implement such a solution in the near future. Through a US$ 20 million revolving fund funded by a GCF grant (SRMI-2[34]), this mechanism aims to ensure that 700 MW of solar projects is able to convert the payments received in local currency into US$ even when the macro-fiscal situation in the country does not allow the central bank to meet these needs (as it would not have enough US$ in its accounts). This solution is an interim solution to allow for the projects to reach financial close, while the fundamentals of the sector are improved to solve the currency availability issue.

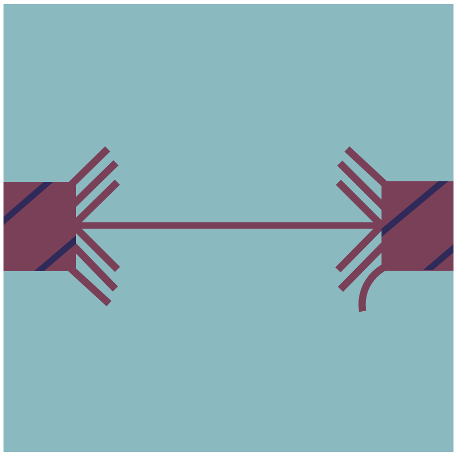
By leveraging funding from the Clean Technology Fund (CTF), Indonesia has agreed to deploy over 350 MWh of battery storage across its eastern islands. [35] Grants provided by the CTF are used to lower the investment cost of batteries, incentivizing the utility, PLN, to take the leap and start deploying this technology, still quite unknown in the country. Without it, PLN would have built more peaking capacity (gas/diesel) to integrate solar generation.

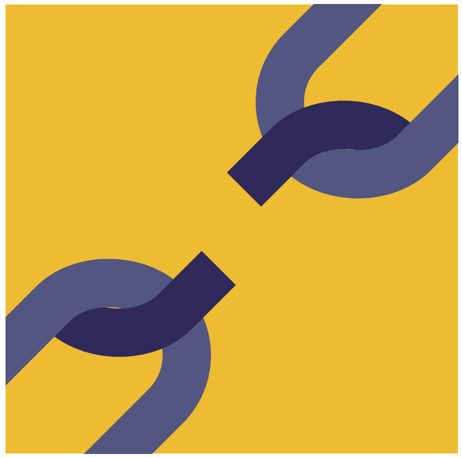
With regards to SIDS, to spur innovation or finance resilience investment, capex buy-down mechanisms can be put in place. As presented in Box 5, a comprehensive package to reduce the cost of generation in Maldives while integrating the resilience risk was developed. It is being replicated in Sao Tome, allowing for the PPA price of these renewable energy projects to be at an affordable level for these utilities and breaking the cycle of expensive generation and poor service as fuel contracts are not paid for, while supporting the specific issues SIDS are facing with small markets, high cost of capital and low IMF debt ceiling.

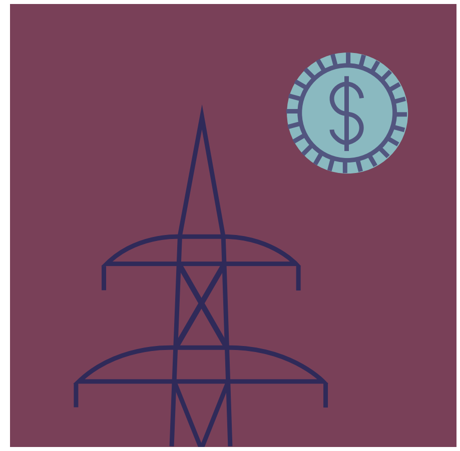
MDBs must not only leverage their existing tools but also adapt to the evolving needs of countries in the midst of implementing the energy transition and mobilizing private investments. If the billions to trillions rhetoric currently does not hold in most EMDC, it remains crucial for governments to establish effective mechanisms to attract affordable private investment. This is essential to prevent an undue burden on their public finances and to minimize the utilization of scarce public resources. However, even if MDBs can provide a comprehensive package of instruments, the willingness of EMDC's governments to steer their country towards the transition, and the ability of developed countries to provide increased financial support, particularly through grants, will be the true game changer.

34 https://www.greenclimate.fund/project/fp204

35 https://www.worldbank.org/en/news/press-release/2023/06/26/world-bank-supports-increased-access-to-sustainable-and-lower-cost-electricity-in-eastern-indonesia







SRMI Sustainable Renewables Risk Mitigation Initiative