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Working Paper

How project finance can advance the clean energy transition in developing countries

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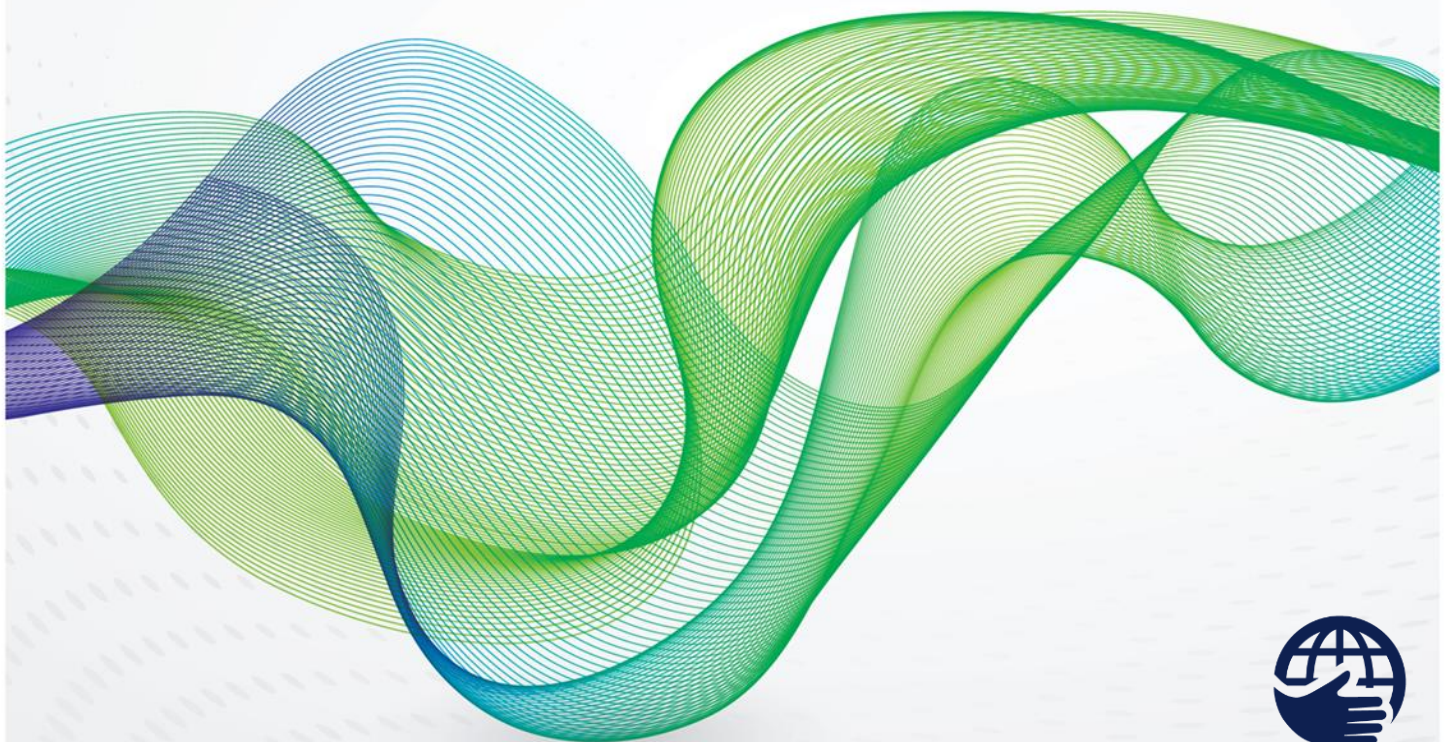
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September 2022

How Project Finance Can Advance the Clean Energy Transition in Developing Countries



Energy
Transition



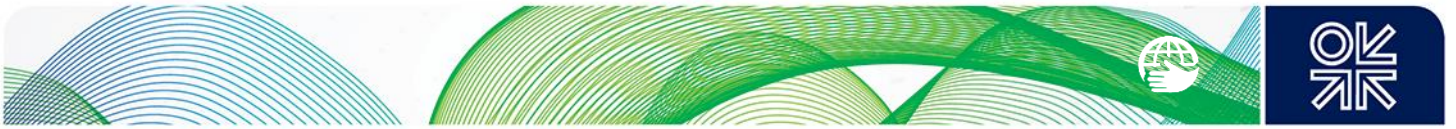
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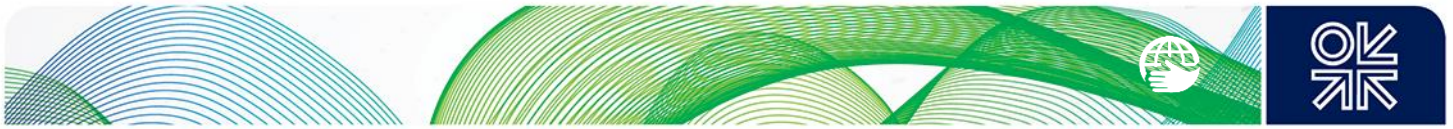
Executive Summary

The world climate imperative requires a substantial increase in clean energy investments across middle- and low-income countries (“MLICs”), where energy demand growth and limited financial resources compound the problem. It is a particular challenge for these countries because of the scale and nature of the investment needed, particularly in power and other infrastructure projects. Infrastructure investment in any country requires long term debt, but local debt markets are limited and foreign debt can expose the project and its lenders to an excessive level of currency risk. In many MLICs, issues of political stability and rule of law add substantially to the challenge. As a result, international debt finance has made only a limited contribution to clean energy projects in the MLICs, with the risk that this may seriously constrain the level of investment to less than is needed to avert dangerous levels of climate change.

Project finance can help to address these challenges and increase funding for clean energy projects in MLICs because it enables separation and allocation of different risks to different parties. This can attract different funders with different risk appetites. It also provides the possibility for targeted credit enhancement products, such as those offered by the World Bank, ECAs and other governmental agencies looking to promote clean investments. There is an appetite from these institutions to do more to support clean energy in the MLICs (as reflected in the \$100 billion per year of support pledged by developed countries). Project finance structures could help to access these various sources of support, and leverage it with commercial debt to increase the overall investment financed.

Other advantages of project finance include assisting sponsors with limited balance sheets to raise long-term funding for projects by segregating “green” assets from carbon intensive ones to attract green-targeted finance, and helping sponsors and host governments to limit and control their financial exposure. It might also provide a vehicle to aggregate small projects with similar characteristics into a larger investment that could better attract investors.

Nevertheless, the challenge will require substantial outside support and innovation to address the critical country risk issues described. The constraint is not the availability of finance in global markets. It is, rather, the currency and other political risks facing these infrastructure projects, and assembling all the skilled resources needed for successful project development and finance. Unless addressed, these two constraints will continue to limit the availability of debt finance and thus the ability to meet global climate change objectives. The solution requires many things including innovation to address the currency risks; cooperation between host governments, development finance institutions (DFIs) and investors to address the various political risks; and the involvement of many parties experienced in financing developing country projects. A major challenge, this also brings opportunities for firms with the necessary skills and capability to manage complex emerging market projects.

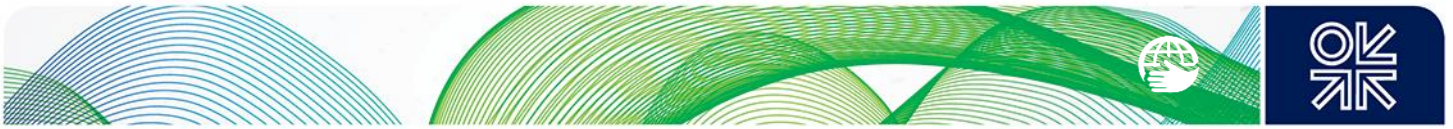


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1. Introduction

This paper addresses the very significant challenge of financing the climate change investments needed in emerging economies and other developing countries -- namely middle- and low-income countries **as defined by the World Bank** ("MLICs").¹ This is particularly important as it is not at all evident how the necessary level of finance can be raised, yet without it the world cannot meet global targets for greenhouse gas emissions. This paper focuses on the role of project finance which could help to provide a small part of the solution.

Transitioning the global energy sector to a low-carbon future consistent with the goals of the Paris Agreement will require an exceptional increase in the level of investment in clean energy. Much of that investment will need to take place in MLICs where growing energy demand will increase emissions absent a significant shift to low-carbon alternatives. For example, the International Energy Agency (IEA) estimates that MLIC energy sectors will see an aggregate growth of 5 gigatonnes of carbon dioxide (GtCO₂) emissions by 2040 under current policies.²

In contrast, the climate goals of the Paris Agreement require a massive drop in global energy sector emissions over the next 30 to 40 years from the current global annual level of about 35 GtCO₂ to near net-zero by mid-century. The IEA estimates a four-fold increase will be needed in the annual level of clean energy investments in these countries (excluding China), from about \$150 billion in 2020 to about \$600 billion in 2030 to achieve the "well below 2°C" global warming target,³ and a seven-fold increase under its 1.5°C target scenario to about \$1 trillion.⁴ In addition, the IEA estimates that by 2040, China will need to invest over \$300 billion more per year in its energy system to achieve its own pledge of carbon neutrality by 2060.⁵

Large as these figures are, they are well within the capacity of global capital markets. By way of comparison, global energy sector investment in 2021 was estimated at \$2.4 trillion,⁶ including \$0.75 trillion on clean energy. In 2020, bonds were issued raising \$10 trillion,⁷ and in 2021 green bond issuance alone grew to about \$500 billion.⁸

This might suggest that finance is not a constraint, and for much investment in the wealthier countries of the Organisation for Economic Co-operation and Development (OECD), that may be the case. But clean energy investments in MLICs (particularly outside China⁹) present a very different revenue and risk profile from the oil, gas and minerals export projects that have historically captured the imagination (and pocketbooks) of international capital markets – particularly because they depend on domestic demand paid for in local currency revenues. This, and other country-specific risks, present a major constraint to finance for clean energy in these countries. At the same time, local long term debt finance, which avoids the currency rate risk, is generally very limited. Much creativity will be required to access existing and new sources of debt and equity appropriate to each investment opportunity, but that alone

¹ This paper uses the World Bank categorisation of countries: "middle income" countries ("MICs"), which includes emerging economies such as Brazil, China, Mexico, India, Indonesia, and Vietnam; and "low income" countries ("LICs"), such as the Democratic Republic of Congo. Given the relative importance of MICs in this discussion, we use the abbreviation "MLICs" for combined MICs and LICs countries.

² IEA, at p. 13, *Financing Clean Energy Transitions in Emerging and Developing Economies*, June 2021 (IEA, 2021).

³ Under the IEA's Sustainable Development Scenario (SDS). (See IEA, 2021).

⁴ Under the IEA's Net Zero Emissions by 2050 scenario (NZE) (see IEA, 2021).

⁵ IEA, "An energy sector roadmap to carbon neutrality in China", September 2021, including Figure 2.11, at p. 73.

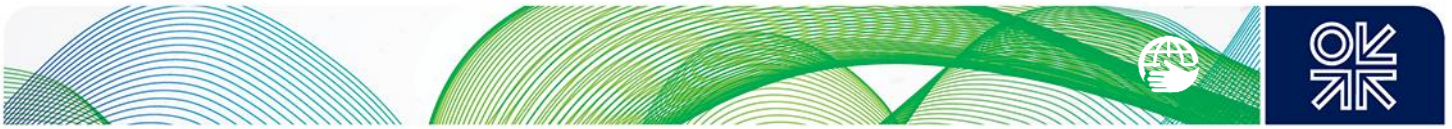
<https://iea.blob.core.windows.net/assets/9448bd6e-670e-4cfd-953c-32e822a80f77/AnenergysectorroadmaptocarbonneutralityinChina.pdf>.

⁶ IEA, *World Energy Investment 2022*.

⁷ *Global Debt Capital Markets Review Q1 2021*; Refinitiv – a London Stock Exchange Group business

⁸ *Financing the Energy Transition: The Role, Opportunities and Challenges of Green Bonds*; A Maino; OIES 2022

⁹ In various places, this paper treats China separately from the other MLICs because it presents a different dynamic given its size and access to domestic and international finance. However, given the weight of China in the global effort, and the potential for project finance in that specific context, China has been included in the analysis.



is insufficient. Financial support from richer countries, whether directly or via development organizations, such as the World Bank Group and others, will be an essential component if climate targets are to be met.

This paper focuses on the debt finance need and in particular on the potential role of project finance. Section 2 reviews the challenges to be addressed. Section 3 describes what project finance is and the role it has historically played. Sections 4 and 5 examine how this tool can be used to advance the clean energy transition in MLICs, and its potential benefits for energy companies and others. Section 6 sets out our conclusions, as well as some recommendations for actions to increase the use of project finance to support the low carbon transition.

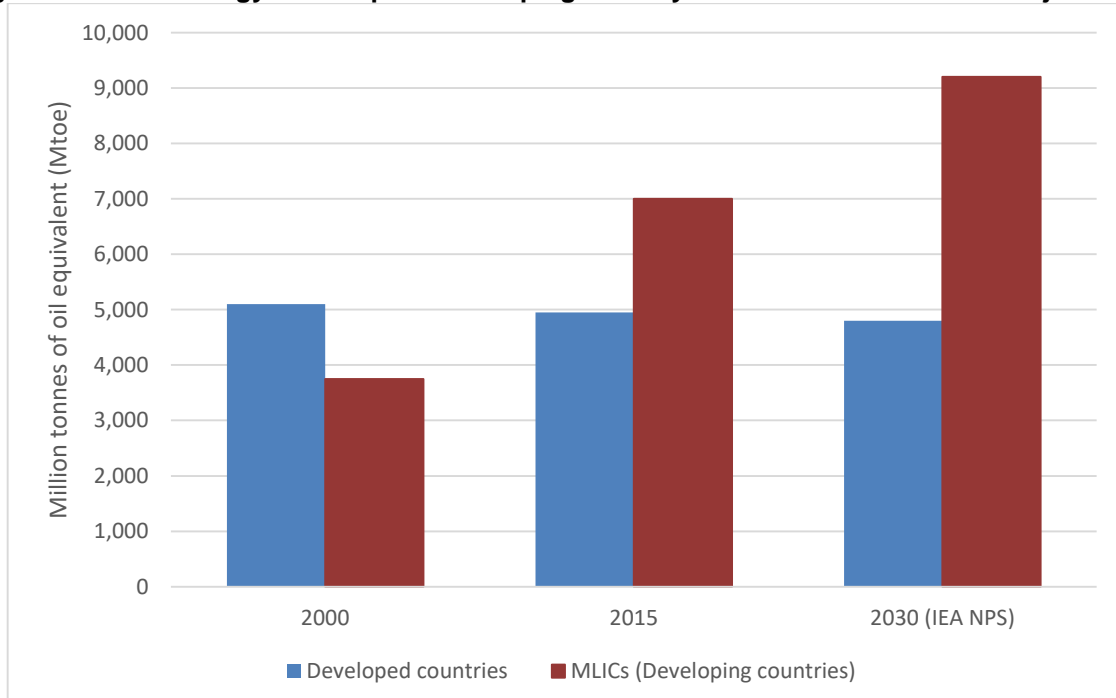
2. The Investment challenge

The developing countries of the world face a dual challenge: expanding their energy systems to meet growing demand to raise standards of living for their growing populations, while also contributing to global emissions reductions. It is this dynamic that drives the need for substantially more clean energy investments across MLICs in particular. There is much information in the public domain as to what the clean energy transition requires, in particular from the IEA which we have taken as our starting point.

2.1 Rising demand for energy in MLICs

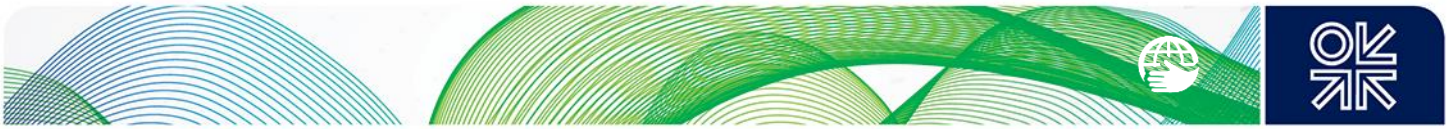
In contrast to the largely flat demand for energy in developed OECD countries¹⁰ over the last twenty years, MLICs have seen a dramatic increase in energy consumption that is projected to continue through 2030 and beyond. As a result, the pattern of global energy consumption flips from a historic majority in developed economies to over 65% in MLICs by 2030 (figure 1).

Figure 1: Global Energy- Developed/ Developing Country Demand: Historical and Projected



Source: Benoit, Chen (Columbia, 2019), drawing from IEA and World Bank data

¹⁰ OECD membership currently also includes various MLICs, such as Mexico and Colombia. We have used “developed OECD” to restrict the reference to non-MLICs.



In large part as a consequence, whilst the stated energy and decarbonization policies of developed countries are expected to reduce CO₂ emissions by 2GtCO₂ by 2040, those of China will likely plateau and those of other MLICs will rise by 5 Gt.¹¹ These trends are clearly insufficient to meet the Paris Agreement global warming goals of well below 2°C, let alone the more ambitious 1.5°C threshold.¹²

2.2 Amount of investment required, with a focus on power and infrastructure

To meet these targets the IEA estimates that investments in clean energy in MLICs excluding China will need to increase by \$450 billion p.a. by 2030 under the “well below 2°C” Sustainable Development Scenario (SDS)¹³, and by about \$900 billion p.a. under the 1.5°C “Net Zero Emissions by 2050” (NZE) scenario¹⁴. Today, the total energy investments in these MLICs totals about \$150 billion p.a.

Moreover, China will need to invest by 2040 an additional \$300 billion p.a. in its energy system to achieve its 2060 carbon neutrality goal.¹⁵ It has also been estimated that China will need \$21 trillion in debt financing over the next 40 years to meet this goal.¹⁶

The IEA estimates that power generation and transmission will comprise about 65% of total clean energy investment¹⁷ across the MLICs excluding China, and they expect it to be financed by about 65% debt compared with slightly under 50% for clean energy as a whole.¹⁸ For these reasons, much of the discussion in this paper is framed by, but not limited to, renewable power generation – which has been a traditional user of project finance (see Section 3). This trend has also extended to newer clean energy technologies. For example, Project Finance International notes that leverage for greenfield offshore wind power has gradually increased from around 60% in 2006-2007 to around 80% in 2010-21¹⁹, which is more in line with much classic thermal power finance.

The investment requirements vary widely country by country. For example, figure 2 presents projections under the SDS by region, excluding China, and historical figures for comparison. Other projections point to similar large financial requirements. India, for example, has been estimated by BloombergNEF to need an average annual investment of US\$ 27.9 billion from 2022 to 2030 to meet the government’s own renewable energy installation commitment.²⁰ Indonesia requires an average of US\$ 13.7 billion per year in renewable energy to meet the Government’s net-zero by 2060 target (a marked increase over current annual levels of less than US\$ 3 billion).²¹

¹¹ IEA, at p. 13, Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021

¹² IEA, at p. 13, Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021

¹³ See IEA, 2021).

¹⁴ Under the IEA’s Net Zero Emissions by 2050 scenario (NZE) (see IEA, 2021).

¹⁵ IEA, “An energy sector roadmap to carbon neutrality in China”, September 2021, values derived from Figure 2.11, at p. 73. <https://iea.blob.core.windows.net/assets/9448bd6e-670e-4cfd-953c-32e822a80f77/AnenergysectorroadmaptocarboneutralityinChina.pdf>.

¹⁶ Estimate of China International Capital Corp, as reported by Reuters, April 1, 2021, <https://www.reuters.com/article/us-china-bond-green-idUSKBN2BO4FP>.

¹⁷ IEA, Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021; data in figs 1.6 and 1.6 implies that power generation and transmission accounts for about 65% of total clean energy investment across MLICs (excluding China) under both SDS and NZE scenarios.

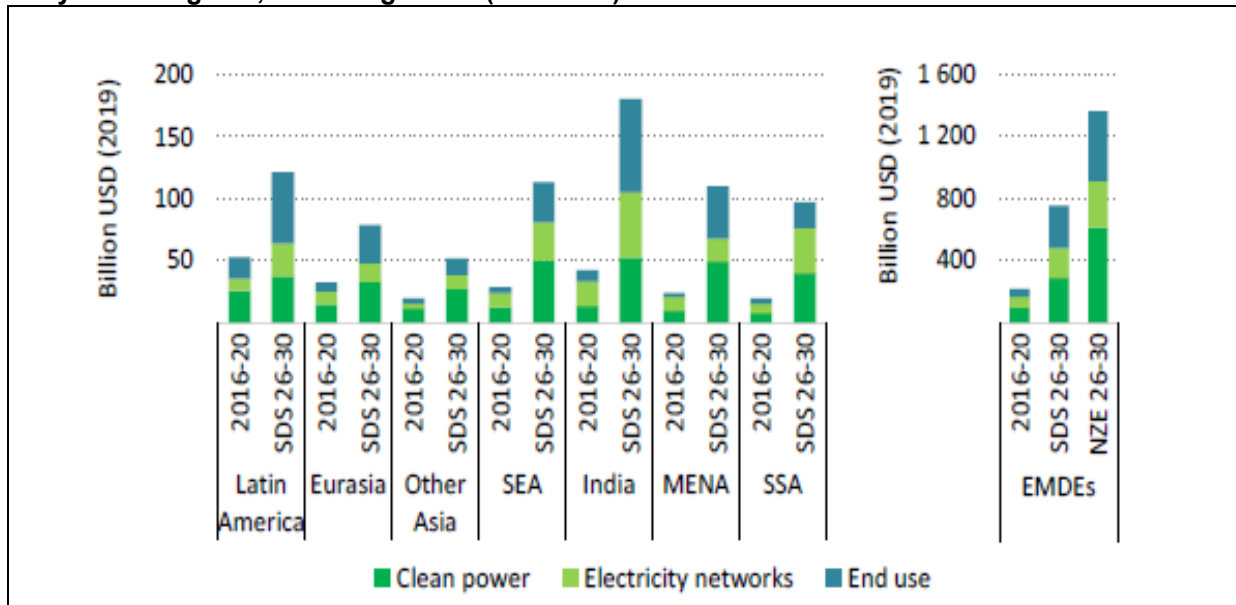
¹⁸ IEA, Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021; fig 2.7

¹⁹ <https://www.pfie.com/story/3151364/offshore-wind-debt-15-years-on-cqwp8mbjh8>

²⁰ “Financing India’s 2030 Renewables Ambition”, Shantanu Jaiswal, Rohit Gadre, BloombergNEF, June 22, 2022.

²¹ “Paris Alignment of Power Sector Finance Flows in Indonesia: Challenges, Opportunities and Innovative Solutions,” Sustainable Energy for All, Climate Policy Initiative, March 2022 (see, e.g., figure 3).

Figure 2: Average annual investment in clean energy under IEA’s SDS scenario: Key MLIC Regions, excluding China (“EMDEs”)



Source: IEA, figure 3.1, EMDE Report (2021)

Whilst the focus of this paper is primarily on renewable power generation and related transmission which will require a high level of debt finance, much of it in hard currency, our assumptions are not inconsistent with IEAs analysis²² for clean energy as a whole for MLICs (excluding China) under its SDS Scenario, for which they assess that: (i) over 50% of the funding will be in the form of debt; (ii) 30% of the funding will be sourced from abroad; (iii) about 70% will be private; and (iv) about 30% will be off-balance sheet.

China presents some important differences from MLICs as a group for purposes of this analysis. It has substantial domestic resources from its historically high domestic savings, and has a long track record of being able to attract large amounts of international capital. It has often been a particularly appealing destination for international industry looking to take advantage of its manufacturing base as well as to gain access to the prospect of its large domestic consumer market. Finally, its energy, as well as its financial sector, is dominated by state-owned enterprises; as a result, China has extensive access to capital including from domestic sources. Nevertheless, the amount of new infrastructure funding needed is massive and, whilst funding sources are ample today²³, it is not easy to predict where all the funding will come from to meet their 2050 target.

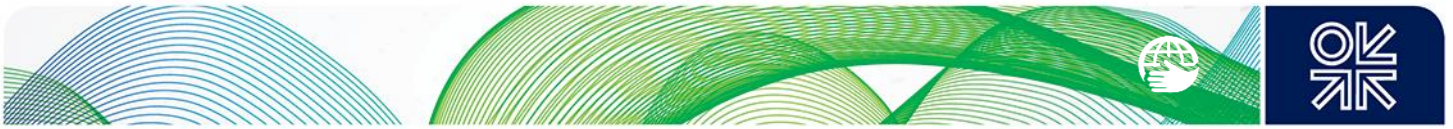
2.3 Characteristics of clean energy projects relevant to their funding

Three factors are particularly critical to the challenge of advancing clean energy projects in the MLICs:

- i. Virtually all clean energy investments in MLICs will be dependent on local currency revenues from local retailers and consumers.

²² <https://www.iea.org/reports/financing-clean-energy-transitions-in-emerging-and-developing-economies/the-landscape-for-clean-energy-finance-in-emdes>.

²³ Note, for example, China industry recently raised US\$ 10 billion for clean technology investments through the second largest global equity market transaction of the year (“China taps markets for \$10bn to cement clean tech supremacy”, Edward White, Cheng Leng, Financial Times, June 24, 2022).



- ii. Energy prices are politically sensitive: consumers and governments may resist decarbonisation if it pushes up energy prices and governments may cap prices or otherwise impact the profitability of the energy companies.
- iii. Clean energy projects, such as renewables, are even more capital intensive than thermal power plants, making finance costs the largest component of the price of power.

These factors are explored further below.

2.3.1 The impact of local demand and currency

The overwhelming amount of clean energy investment needed is for local projects generating local currency revenues from local demand. Unlike oil and gas export projects that have been able to attract significant foreign investment in MLICs (see Section 3.5.1), the domestic nature of power projects, including renewable power, exposes projects to significant local risks, including payment risks from often financially stressed local purchasers. Another important impediment is the risk that the local currency will fall in value, thereby greatly increasing the cost of servicing hard currency debt. The 1997 Asian financial crisis led to widespread defaults among domestic projects financed in US Dollars due to devaluation. The Paiton Power project – Indonesia’s largest and a modern efficient US\$2.7 billion coal-fired plant – was thrown into default after the Rupee devalued from Rp2450/US\$ to Rp7400/US\$. Even though sales tariffs were indexed to the dollar, state buyer PLN was unable to pay from its Rupee sales revenue and defaulted on its lifting obligations. Eventually the government sponsored a settlement with renegotiated tariff structure and debt terms.²⁴ Lenders to Thailand’s refinery sector were less fortunate: Thaioil, Thai Petrochemical Industry and Thai Lube were all thrown into default. In Thaioil’s case, lenders lost around 40% of their US\$ 2.2 billion of debt in a major court-imposed debt restructuring²⁵.

A further constraint in many MLICs is the level of policy stability, rule of law and enforceability that is required by providers of long-term debt finance. Moreover, domestic purchasers of clean energy investments may often lack the creditworthiness of international offtakers of oil and gas. These factors impact all projects in that country, but are more problematic with domestic revenues where governments may see less incentive to intervene in disputes among local stakeholders as compared to resolving a dispute in an export project that can adversely affect its ability to earn needed foreign currency.

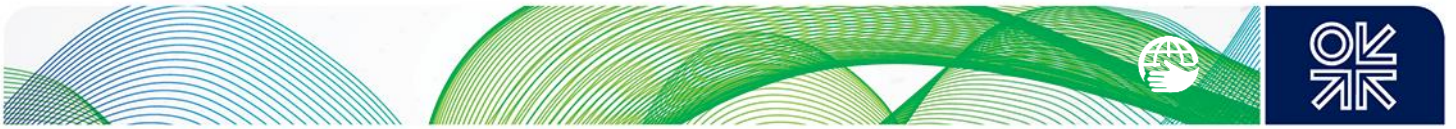
2.3.2 Political sensitivity of energy prices

The recent disruption to energy markets following the outbreak of war in Ukraine has demonstrated the political sensitivity of energy prices. In domestic markets the pain is felt most acutely in lower income households where energy takes a higher proportion of disposable income. In many lower income countries, power is subsidised by government²⁶, but whether or not, any new power supply has to compete with existing supplies, or lead to price increases to the consumer and/or government subsidies, neither of which may be acceptable. Given the poverty challenges faced in many MLICs, the inability or unwillingness of consumers to bear increased costs can be a formidable constraint to the global effort to decarbonize. This is particularly relevant where renewable power is not the cheapest electricity source, but is installed primarily to reduce GHG emissions.

²⁴ https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/Cross-Border-Infrastructure-Toolkit/Cross-Border%20Compilation%20ver%2029%20Jan%2007/Session%204%20-%20Private%20Sector%20Participation/Private%20Sector_04%20Case%20Study%20in%20Renegotiation%20-%2029%20Jan%2007.pdf

²⁵ <https://www.wsj.com/articles/SB942616387454087547>

²⁶ Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021, IEA, figure 2.10.



2.3.3 Capital structure and finance costs

Renewable power is highly capital intensive, even more so than thermal power, with high capital costs and low to very low operating costs. As a result, the cost of finance – debt and equity combined, is by far the largest component of the overall cost.

To minimise costs, power generation projects are generally structured as a utility with predictable cash flows, high leverage and modest utility-type equity returns. This is how thermal power has been financed in many countries, and the model is being successfully applied to renewable finance.²⁷ To date, however, this has primarily occurred in high income countries where lenders can rely on the stability of the contractual or regulatory framework that provides a predictable income stream, and the ability of consumers to pay. In contrast, the additional risks faced by clean energy investments in many MLICs, in particular reliance on local purchasers, currency risk and political stability/rule of law, makes finance excessively expensive if available at all.

Some potential means to address these challenges are suggested in Section 4.

2.4 Access to debt markets

2.4.1 Access to foreign capital

International debt has been a major provider of debt for energy infrastructure projects globally, the two principal sources being the capital markets (bonds), and project finance (i.e., commercial banks, which generally do not lend for 10-15 years and other similar long tenures absent a secured project financing structure). Although the availability of capital has been cyclical in nature (affected by various factors, including recurrent international financial crises)²⁸, the public and private bond markets combined comprise the largest source of long-term debt globally. Access to these markets, and loan pricing, are largely driven by the rating issued by one or more of the professional debt rating agencies. For any corporate or project, one determinant of this is the host country's sovereign debt rating, as the agencies will generally not rate any entity above the host sovereign²⁹. Entities with investment grade ratings (BBB- or better) can generally raise debt in international markets at reasonable cost. Those with sub-investment ratings, including many MLIC countries, will pay a significant premium, if able to borrow at all. (Figure 3).

For domestic projects, lenders will apply a risk premium on top of the sovereign pricing to account for specific project risk. This premium can be substantial and for many countries there is little or no appetite in the bond markets for long term debt to domestic projects, leaving project finance as the only available third-party source of long-term foreign debt, and then generally only with substantial credit enhancement from ECAs and other specialized multilateral and national providers of international finance.

²⁷ PFI project finance 2021, Refinitiv an LSEG business.

²⁸ See, for example, change stemming from the 1997 financial crisis, as discussed in "Capital Flows in East Asia since the 1997 Crisis", Robert McCauley, BIS Quarterly Review, June 2003, https://www.bis.org/publ/qtrpdf/r_qt0306e.pdf.

²⁹ The main exception to this is project finance applied to an export project with secured export revenues where the agencies may assign a rating better than the sovereign.

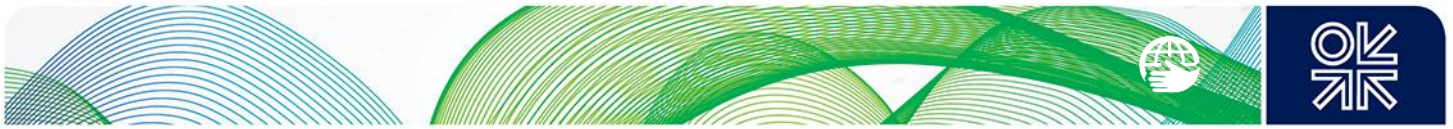


Figure 3: Borrowing costs increase sharply with rating

S&P Rating	Selected Countries	
AAA	Australia, Switzerland, Canada, Germany, Singapore	Investment Grade
AA	France, Abu Dhabi, South Korea	
A+	China, Japan	
A	Chile	
A-	Malaysia, Saudi Arabia	
BBB+	Philippines, Thailand	
BBB	Indonesia, Mexico, Peru	
BBB-	Columbia, India, Kazakhstan	
BB+	Azerbaijan, Morocco	Non-Investment Grade
BB	Vietnam	
BB-	Bangladesh, Brazil, South Africa	
B+	Bahrain, Bolivia, Turkey	
B	Egypt, Kenya	
B-	Cameroon, Pakistan, Papua New Guinea	
CCC+	Argentina	
CCC	Sri Lanka	

Countries where the Sovereign is rated thus

Source: Standard & Poor's Global Sovereign Rating Outlook 2022

2.4.2 Access to domestic capital

Local currency lending is extremely important because it avoids the currency mismatch that occurs with hard currency loans. But local long-term debt is scarce in many countries and can be expensive even for the sovereign (Figure 4). Note that these 10-year finance costs are local currency interest rates. Whilst they are impacted by the sovereign rating, they are more affected by the supply and demand for local currency, so can differ widely from the cost of dollar borrowing.

There are, however, potentially untapped local sources of finance, which vary from country to country, that might be mobilized to finance clean energy assets. For example, while MLICs in the Asia Pacific exhibited savings rates relative to GDP of over 15% in 2019 (nearly doubling as compared to 2015), China's rate was nearer to 4% (albeit, for a massive economy), while Latin America and Africa had negative rates.³⁰

³⁰ IEA, Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021, at figure 2.20,

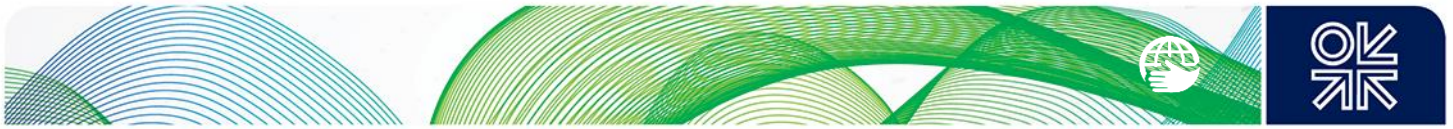


Figure 4: Sovereign borrowing costs in local currencies

	GPD 2020 US\$ billion	Sovereign debt rating (S&P)	10 year Sovereign bond yield (local currency)
China	14,863	A+	2.8%
India	2,668	BBB-	7.2%
Brazil	1,449	BB-	12.6%
Mexico	1,087	BBB	9.2%
Indonesia	1,060	BBB	7.5%
Turkey	720	B+	25.7%
Thailand	500	BBB+	3.3%
Nigeria	429	B-	11.7%
Egypt	364	B	16.3%
Philippines	361	BBB+	6.1%
Vietnam	343	BB	3.3%
South Africa	335	BB-	10.0%
Bangladesh	323	BB-	7.5%
Colombia	270	BB+	11.1%
Pakistan	262	B-	13.3%

Investment grade / non-investment grade

Source: WEO economic data and Worldgovernmentbonds

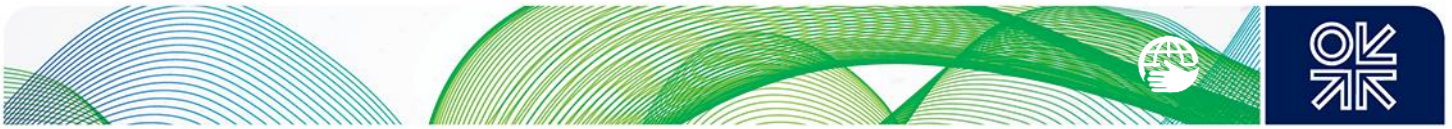
2.5 Climate finance

In parallel, there has been a surge of interest in climate-dedicated financing, from both public and private sources. In this regard, developed countries have pledged to mobilize \$100 billion p.a. for climate financing for developing countries, a figure that has yet to be reached and is being tracked by the OECD, among others³¹. Whether it is from public sources (e.g., commitments from G-7 and other countries), or the private sector (e.g., green bonds), there is a stated interest among many financiers to provide additional dedicated liquidity for clean energy investments. Another potentially important source of funding is carbon markets, including voluntary and pursuant to Article 6 of the Paris Agreement – although the magnitude and availability of these resources currently remains uncertain. Similarly, it is possible that ESG,³² regulatory or other corporate considerations could lead to an increased effort by financial institutions to seek out investments in clean energy.

All of these factors may increase the amount of financing for clean energy projects in MLICs. But while it is likely there will be an increase in the attention paid to these types of projects, it is unclear to what degree this will translate into the level of additional funding required to achieve international climate objectives.

³¹ OECD (2016), 2020 projections of Climate Finance towards the USD 100 billion goal: Technical Note, OECD Publishing, <https://www.oecd.org/environment/cc/Projecting%20Climate%20Change%202020%20WEB.pdf>.

³² ESG refers to environmental, social and governance issues.

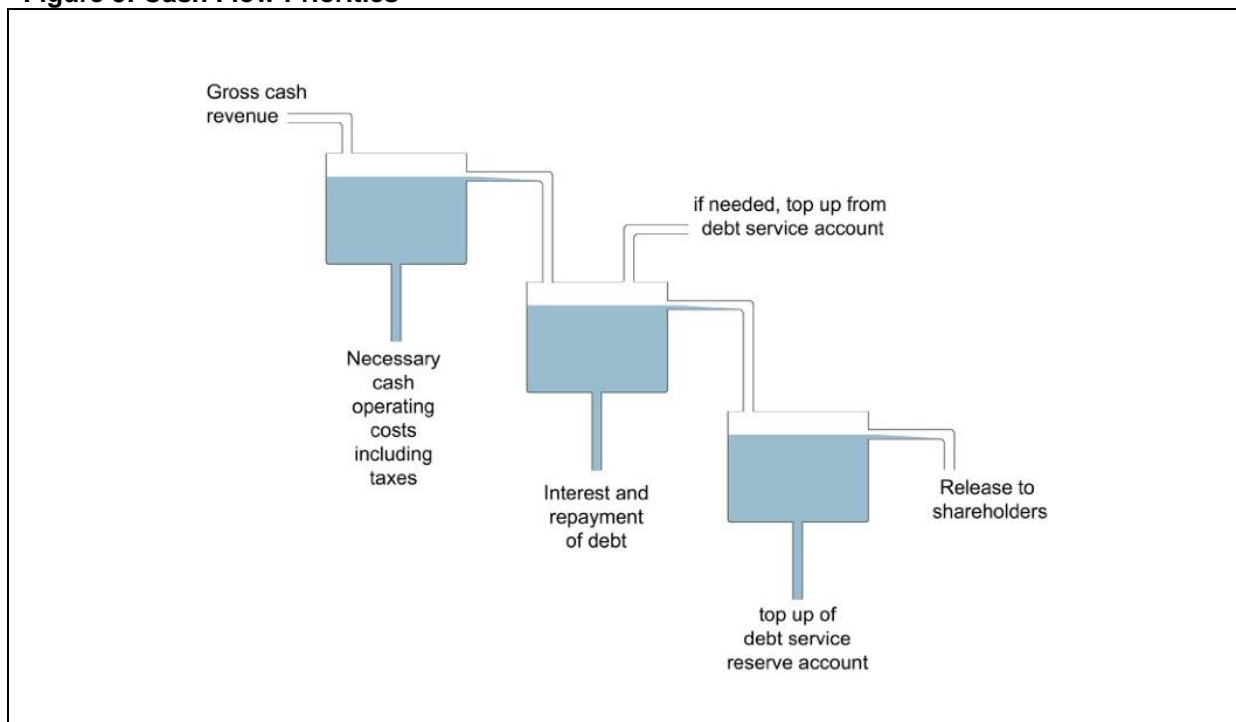


3. Project finance

3.1 What it is

Project finance is a well-established financial structure used to mobilize third-party debt on the basis of specific assets and revenues, rather than the corporate balance sheet of the project sponsor.³³ While individual project finance structures might differ, there are several common elements. First is the segregation of project assets, often through the creation of a special purpose vehicle. Second is funding through a combination of sponsor equity and third-party debt (see figure 6). Third, and most importantly, is the segregation of cash flows through secured accounts and their attribution to project lenders on a priority basis (see figure 5). An escrow agent receives all project revenues and pays out according to an agreed “cashflow waterfall” whereby funds are directed first to necessary cash operating costs and taxes and secondly to debt service obligations, before any shareholder or discretionary payments. A debt service reserve account, funded at the outset and topped up from available project cash flow, provides a cash reserve or, typically, six month’s debt service. By this means, if there is insufficiency of cash flow, whatever cash is available is employed first to keep the plant operating and thereafter to debt service.

Figure 5: Cash Flow Priorities



Source: Author’s depiction

3.2 A variety of participants

Within this generic structure, details vary according to need, and to the differing objectives and constraints of the various players (see figure 6). These might include:

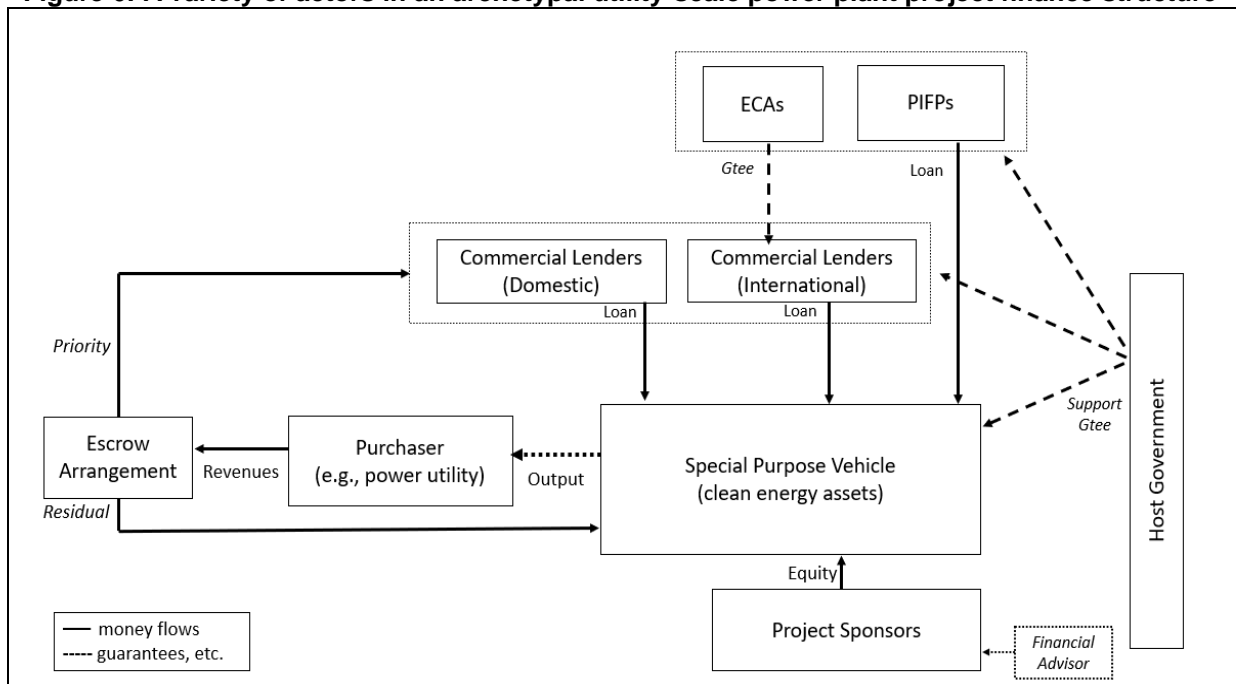
1) Sponsors

For any project finance to succeed it must take account of the, often divergent, needs of its various sponsors. Sponsors may include large and/or small energy companies, utility developers,

³³ “Project Finance at the World Bank: An Overview of Policies and Instruments”, Philippe Benoit, World Bank Technical Paper Number 312 (World Bank, 1996).

government and other local sponsors. Major oil and gas projects are often led by large international energy companies, many of which do not generally need or seek project finance, but may do so when in partnership with weaker companies which they would not wish to carry, or sometimes to help mitigate political risk. In contrast, power developers more often evaluate their investments on a leveraged basis, so the availability of a high level of project finance is important to them. Sovereign sponsors may have very specific needs, for example the terms of their sovereign debt from multilateral development banks may constrain their ability to pledge their public sector project assets.

Figure 6: A variety of actors in an archetypal utility-scale power plant project finance structure



Source: Author's depiction

2) Commercial Lenders

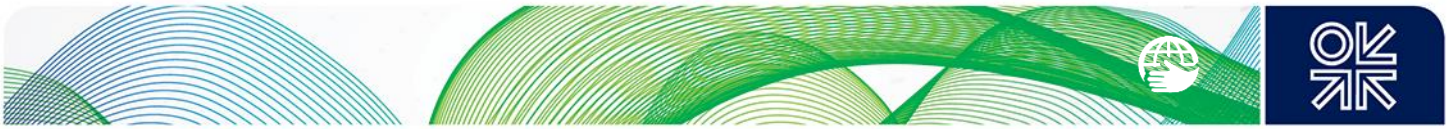
International Banks

A limited number of international commercial banks have historically formed the core of project finance lending since its inception. Banks typically participate through a syndication structure, with leadership provided by those banks that have built specialist teams with the necessary expertise to perform the time-consuming tasks of advising and structuring project financings. Tightening banking regulation, the latest being Basel 3³⁴, has increased the cost of long term bank lending somewhat, particularly in MLICs where banks are less able to re-distribute loans to other markets. Nevertheless, a range of (mostly European and Asian) banks remains active in emerging market project finance.

The Bond Markets

The public and private bond markets constitute the largest source of long-term debt globally, financing sovereigns and corporates in developed and emerging markets. Project finance bonds have been largely restricted to investment grade, high income countries, but deals are being done for power projects in some MLICs. In 2021 the largest project bonds in MLICs included two,

³⁴ <https://www.bis.org/bcbs/basel3.htm>.



approximately \$1 billion, bonds for power transmission projects in Chile and in Kazakhstan³⁵, and in January 2022 the Sweihan PV Power Company in Abu Dhabi issued \$700 million in senior secured green bonds maturing in 2049 for its solar PV project which was completed in 2019³⁶.

There would seem to be an opportunity for markets to open up for energy transition finance in emerging markets as the profile of long term, predictable, income is exactly what the primary investors of pension funds and insurance companies require. In particular, the ability to tap local long-term investors though local markets for project bonds could provide valuable local currency funding. For both bank and bond finance, the critical constraint remains local country risk including political and regulatory risk and the currency mismatch risk. As described below, project finance structures (with bank or bond lenders) could be used to allocate and mitigate some of these risks.

Local Commercial Banks

Project finance may include a tranche of local debt, which avoids currency mismatch and is seen as providing useful local knowledge and perhaps an element of political risk mitigation. Besides its often limited availability, local banks are not always familiar with project finance and the detailed credit analysis required, and may have tenor limits that are significantly shorter than for offshore lenders. Nevertheless, international lenders like to see some exposure of local banks and may accommodate them through a local tranche of debt, often on different pricing and tenor.

3) International development and other public agency financial support

A wide array of specialized public financial institutions, such as the World Bank Group, regional development banks, national developmental finance institutions, export credit agencies and others (collectively referred to in this paper as Public International Finance Providers – “PIFPs”) are already active in supporting the energy transition in MLICs and are often well placed to take the currency and other country risks involved. Many of these organizations are increasingly focusing their activities on supporting clean energy investments specifically.

Among PIFPs, Export Credit Agencies (ECAs) have been particularly active to date in supporting energy investments in MLICs, especially for commercial lenders. These organizations have been established by many countries to support export trade, with programs for short term trade and long-term investment, within international trade rules designed to maintain free trade. ECAs can provide political risk guarantees to commercial banks financing the purchase of goods and services from their country for a foreign investment, allowing those banks to categorise their loans as substantially protected from political risk. However, many other country risks, including currency mismatch, are not covered by the ECAs’ limited definition of political risk and, as banks’ risk assessment and reporting tightened, this political risk cover became less favoured. It is now more common for ECAs to provide fully comprehensive cover for such loans, or direct loans in parallel with the commercial banks.

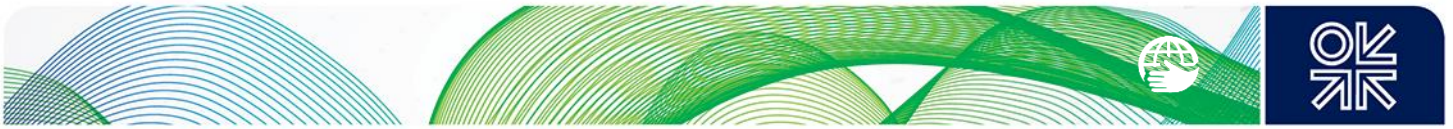
The participation of the World Bank Group specifically has often been viewed as useful by foreign lenders and other investors to mitigate host government political interference given its influence over MLICs.

4) Arrangers and advisers

Project sponsors and prospective lenders will each employ a range of advisers covering such matters as financial and legal structure, technical, market, environmental and social issues, security and insurance. This “due diligence” process contributes to the identification, assessment, avoidance and mitigation of risk and the success of project finance, but it does increase the cost

³⁵ Project Finance International subscription data, Refinitiv, an LSEG business

³⁶ <https://www.marubeni.com/en/news/2021/info/00001.html>.



5) Host governmental authorities (national and local)

Whether directly involved in the project or not, host governments have an important role in facilitating the project, such as in permitting, licensing and legislating. Lenders need to understand the host government perspective to satisfy themselves that the project is in accord with government's interests and that adverse government actions are unlikely.

Project finance will attempt to combine these different groups to the project's best advantage. In many cases a common terms agreement will provide for all lenders to share cash flows and risks on a common basis. In others, risks are allocated differently to different lender groups. For example, local bank funding may be repaid a year or two earlier than commercial banks, and ECAs may be repaid a year or two later. ECAs and other PIFPs (including bilateral financial institutions, such as the Japan International Cooperation Agency and the US Development Finance Corporation, as well as international organizations such as the World Bank and other regional development banks) can lend and/or provide guarantees to banks under which they absorb a share of the political risks (albeit, often backstopped by an agreement with the host country). Whilst each lender group has its preferred structures, most large and challenging project financings involve extensive multi-party negotiations, and the end result is a bespoke structure for that project.

3.3 Benefits of the project finance structure

3.3.1 Accessing long-term debt

For many emerging market projects, project finance remains the only source of long-term (over 10 years) third party debt. Given the growing investor appetite for green bonds, most of which to date have been with full recourse to creditworthy corporate, financial or governmental entities, the potential exists to expand debt market capacity by sound project finance structures for clean energy projects.

3.3.2 Creating Bankability

Two features of project finance help to establish the creditworthiness of a project. First is the structure which legally separates the project's assets and cash flows, protecting the project and its lenders from liabilities beyond the project. Second, is the extensive risk analysis and cash flow sensitivities which help to establish the project's resilience to known risks. By these means, project finance helps to enhance the bankability of the project and the ability of sponsors with limited balance sheets to fund projects by dedicating finance to identified and segregated revenue producing assets.

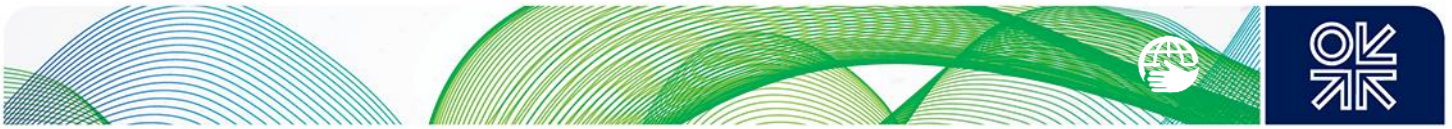
3.3.3 Reducing and Managing Risks

Project finance can, in some circumstances, help to further mitigate risk by risk reduction and/or by risk transfer. Using a motoring analogy, a driver can reduce financial risk from damage by driving more slowly (risk reduction), or by insurance (risk transfer). Project finance allows both techniques to be used. For example, the involvement of an intergovernmental agency in a project loan can potentially reduce political risk as the host government may be less likely to negatively impact the project if an institution such as the World Bank is involved. The project finance structure can also facilitate risk transfer, which can enable allocating risks to those best able to manage them (while recognizing the common desire of participants to shed risks to others).

3.3.4 The appeal of off-balance sheet financing

For some sponsors, an important attribute of the project finance structure is that it enables them to shift the attendant financing and liabilities to a separate entity, and thereby fund the project off their general corporate balance sheet ("off balance sheet")³⁷. The segregation of the project's assets and finance can be advantageous in allowing it to invest and raise finance in its other businesses without interference from the project finance. This is often accomplished by creating a special purpose vehicle

³⁷ Modern accounting principles often require the project finance debt to be included on balance sheet with footnotes as to its limitation of recourse to the corporation, but the point remains that such debt can be viewed as "off risk" to the corporation.



(“SPV”) to hold the assets (e.g., power generation plant), to receive the revenue flows and to repay the debt (typically through escrow arrangements, as presented in Figures 5 and 6 above).

3.3.5 Facilitating Public International Finance

In part because it provides assurance that funds are used only for a designated purpose, project finance can be an effective vehicle to enable funding and credit enhancements from PIFPs, such as multilateral and national development banks, development finance institutions, export credit finance agencies and other international sources of public international finance. As described above, these institutions can accept a different risk profile from that of commercial lenders and have traditionally contributed by taking some political risk, such as currency convertibility and expropriation.

3.4 Constraints

Project finance, however, also presents a variety of limitations and other constraints; particularly that it is time-consuming and expensive to set up. Many skills are required to develop and finance a new renewable power project including technical, economics, land acquisition and other local considerations, rule of law, finance and politics, as well as the overall project management to coordinate these skills toward a successful development. Thus, the key constraint to project finance at times may not be the supply of funds but the availability of the necessary knowledge and expertise – in project sponsors, lenders and their various advisers. Where some considerations are missing, such as the necessary legal framework or clarity of government energy policy, the resultant delays can make investment unattractive.

Wind and solar are less dependent on economies of scale than most thermal power, and ideal for smaller distributed power generation models. But the complexities, challenging due diligence and high fixed costs of raising finance combine to severely limit finance for small projects and developers. Whilst this limitation may in some circumstances be surmountable by bundling of projects, differing ownership and risk profiles can make this difficult.

3.5 Financing to date

Project finance has a long history of finance for power generation and other projects. In 2021 project finance raised \$312 billion globally including \$134 billion for power projects and \$58 billion for oil and gas³⁸.

3.5.1 For export projects

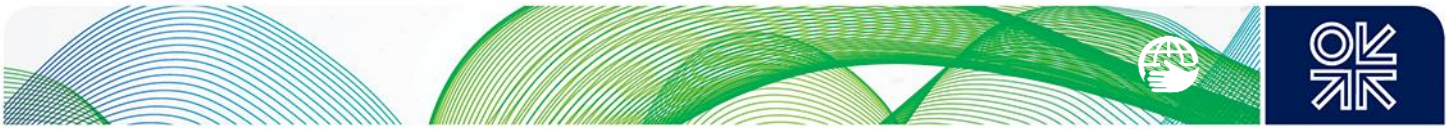
There is an extensive track record of project finance in sub-investment grade countries for projects generating hard currency export revenues. For example, LNG projects have been able to attract foreign debt for the majority (typically up to 70%)³⁹ of the huge investment cost in many low-income, sub-investment grade countries including Yemen, Peru, Indonesia, Nigeria, Papua New Guinea and Mozambique⁴⁰. In each case the loan agreement provides that dollar revenues are paid offshore into a secured trust account from which debt service is paid directly in offshore dollars (after essential cash operating costs). This protects the project and its lenders from many country risks including that of currency conversion. In many cases some sponsors, including the local government, would have found it difficult to otherwise finance their share of the project. Papua New Guinea LNG⁴¹ was a particularly interesting example, where most banks that participated had no available credit limits to lend to any project or company in the country. They were able to make an exception, viewing the LNG project to

³⁸ Data from Refinitiv, an LSEG business.

³⁹ LNG Finance – will lenders accommodate the changing environment? Baker; OIES November 2020.

⁴⁰ The validity of this export finance model was well demonstrated following the Asian financial crisis in 1997, when most power and telecoms financings across Southeast Asia fell into default due to currency devaluation but the Indonesian LNG export projects were unaffected.

⁴¹ https://www.gti.energy/wp-content/uploads/2018/12/1-6-Steven_Kane-LNG17-Paper.pdf



be strategically important to the country and to the project's investors and LNG buyers, and noting that they had priority access offshore to dollar revenues from the LNG buyers.

3.5.2 For domestic projects, notably power projects

In contrast, the majority of project finance raised for power generation projects, both thermal and renewable, has been in high income countries including the US, much of Europe, Australia and elsewhere. (The five largest renewable power project financings in 2021 were in the UK, France and United States).⁴² Project finance is extensively used in the US, frequently combining commercial bank loans and project bonds. The banks will issue a medium-term finance 'package' (Mini-perm), structured as project finance but repayable in full after construction, but well before the facility can be amortised from cashflow. Banks can accept this only because of the deep market availability of project bonds as well as corporate bonds. (Such bonds provide a vehicle for pension funds, insurance companies and other investors interested in long-term, moderate yet stable returns). Project bonds are less commonly used for the initial construction as they need to be fully drawn at issue.

In MLICs, relying on power sales into a price-sensitive market, often through a state-owned distributor whose credit standing may not be strong, is challenging; but there are successful commercial examples. The Middle East model for power and power/desalination projects raised over \$57 billion of debt toward the total investment cost of around \$75 billion over the decade 1999-2019 across the varied countries of the Gulf Cooperation Countries' (GCC), using a standardized model with which lending banks were able to accept.⁴³ The model retained competition through a bidding process whereby developers pre-arranged the finance and bid to supply under a long-term Power Purchase Agreement (PPA). These agreements provided that cost changes (including fuel costs and currency changes) were passed through to the buyer such that the project received a predictable revenue stream. Country risks existed, but central government support was assumed (and in some cases contracted) as governments were presumed not keen to see a state-owned distributor default on its obligations. This same model has been used extensively elsewhere, including in Egypt, Saudi Arabia, Morocco, Tunisia, Turkey and Mexico.

Export credit agencies have played a significant role in most of these financings, lending (or guaranteeing bank debt) in parallel with uncovered bank debt. In doing so they added valuable debt capacity, and some risk mitigation, because banks might assume that host governments will be less keen to cause a default if government agencies as well as commercial banks are involved.

In many developing countries, power and infrastructure finance is achieved with substantial involvement of public international finance providers (PIFP), such as the World Bank Group, development finance institutions (Japan's JBIC or the US DFC). This is the case for various reasons including demand and (especially) currency risk, weaker sovereign governments or government support, and less transparency or legal framework.⁴⁴

Interestingly, the project finance structure has repeatedly been used by Chinese companies under the government-supported Belt and Road Initiative (BRI) project to fund power and other infrastructure projects in MLICs specifically.⁴⁵

4. How project finance can advance the clean energy transition in MLICs

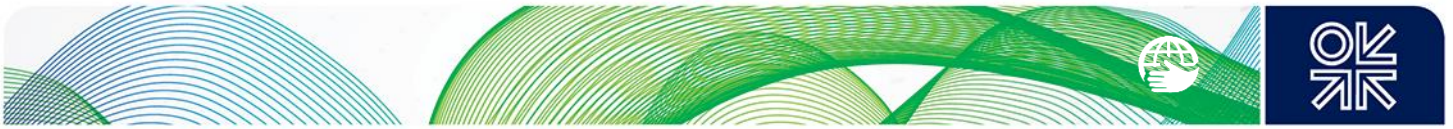
Project finance provides an important financial structuring option for clean energy investments in MLICs. While project finance is often presented as a tool to permit project sponsors to limit exposure by financing projects off their balance sheets ("off-balance" sheet), in the clean energy transition, the

⁴² Refinitiv, an LSEG business

⁴³ Project Development for Power and Water, a Middle Eastern Case Study 1999-2019, P Conway EMEA Energy Consulting Ltd; private presentation.

⁴⁴ One company looking to develop renewable finance across Africa noted that, for many projects, there is no shortage of offers to finance, and they are all from DFIs and other PFIPs.

⁴⁵ See, e.g., financing for Dawood 50MW wind farm, and Port Qasim 2x660 MW coal power plant, both in Pakistan.



biggest advantages are its ability to get more projects financed. This section describes some of the ways in which this is accomplished, with a particular focus on how project finance can support specifically clean energy investments in MLICs.

4.1 Attracting finance where corporate finance is lacking

A critical attribute of project finance in MLICs is its ability to attract long-term debt funding to projects whose sponsors (or any one of them) do not have access to debt themselves. This is particularly relevant for MLIC sponsors of clean energy investments that do not enjoy either the massive balance sheets or the creditworthiness of larger project sponsors in advanced economies. In many cases, the required clean energy investments exceed the balance sheets and borrowing capacities of MLIC project sponsors outside the oil and gas sector.

If the additional country risks inherent in a domestic MLIC project can be addressed, project finance provides an effective way to access foreign lending other than straight sovereign debt. The solution will vary country to country including, for some, local government assurance of currency availability and transferability. Nevertheless, the level of finance needed by MLICs for clean energy investments is unlikely to be achieved without substantially more support, such as from MBFIs or other “rich country” sources.

4.2 Segregating “clean” and “green” from other assets

Project finance provides a mechanism to segregate low-carbon assets from more carbon intensive ones, which could help to attract the increasing investor interest in green assets. There is, for example, a growing market with strong investor interest for green bonds, which include various verification procedures, but also often cover a wide set of assets at a corporate level.⁴⁶ The project finance structure provides an effective tool for a sponsor to finance a limited set of green assets (e.g., a single or limited set of new renewable power plants). This could provide a way for projects to access a larger funding base by attracting specific capital investors or specialized and “green” dedicated sources of funding.⁴⁷

4.3 Targeted risk allocation for diverse group of participants

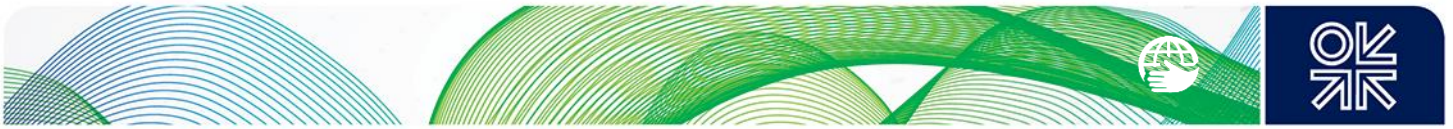
As described earlier, the project finance structure allows for the segregation and allocation of specific risks to specific project participants. This can be a particularly important instrument for funding projects in many MLIC contexts that present risks which lenders are unwilling to accept without specific support, and which IFIs (such as the World Bank and regional development banks) are prepared to cover (consistent with their development and now expanding climate mandates).

This allocation of risks amongst different participants could facilitate the design and deployment of innovative financing products that target specific problematic risks. For example, some of the US\$ 100 billion pledged by developed countries to support the clean energy transition in developing ones could be used to fund risk guarantee products covering sub-sovereign, public utility and other state-owned enterprise obligations without requiring a sovereign guarantee (in contrast to the World Bank’s partial risk guarantee product)⁴⁸. Alternatively, these funds could be used to expand, beyond what current commercial hedging markets provide, the coverage of currency exchange risk which constrains the amount of foreign financing MLICs can raise for their local-currency generating clean energy projects.

⁴⁶ Financing the Energy Transition: The Role, Opportunities and Challenges of Green Bonds. A Maino; OIES 2022.

⁴⁷ There are numerous examples. See, e.g., the April 22, 2022 announcement by Ardian for an initial 1 billion euro call under an EU-supported dedicated clean energy investment facility (<https://www.ardian.com/press-releases/ardian-launches-first-open-ended-fund-dedicated-energy-transition>).

⁴⁸ Sub-sovereigns and state-owned enterprises will often likely be key actors in clean energy investments in MLICs. The Multilateral Investment Guarantee Agency has developed products which could provide insights for expanding the menu and volume of this type of coverage without sovereign indemnities (<https://www.miga.org/product/non-honoring-financial-obligations>).



Host countries can also do more, for example by redeploying their own fiscal revenues to support the transition to clean energy investments⁴⁹, given the economic benefits these projects generate.

4.4 Avenue for blended finance

Besides MBFI support, blended finance, which merges commercial investment with concessional climate financing, is receiving increased attention. Project finance, including its ability to segregate green assets and revenues, provides an effective structure to attract blended finance products. This gives a sponsor of a clean energy investment the ability to potentially tap into climate-dedicated climate finance products that it would not qualify for through its corporate balance sheet.

4.5 Raising domestic funding

Project finance can be an effective tool to tap into domestic financial resources. Many project financings include both local and foreign lenders, with a local bank tranche with its own tenor, pricing and other terms, but where local banks can benefit from the structuring experience of the offshore banks, who in turn benefit from the local knowledge of the local banks.

The opportunity to tap into under-exploited domestic investors such as pension funds and other sources of local savings may offer significant potential. For example, project finance could be used to establish a portfolio of clean energy projects to be funded by a dedicated clean energy venture or other fund that attracts local investors. This can be particularly interesting for MLICs that have high levels of savings (such as China and various MLICs in the Asia/Pacific region – see Section 2.4.2).

The US Mini-perm to bond market structure described in Section 3.5.2 is less applicable outside highly developed markets where the ability to refinance is assured. But the concept of combining banks' structuring expertise with local investors looking for long term income could be explored in MLICs, perhaps including China, and could provide an effective means to finance their clean energy power projects.

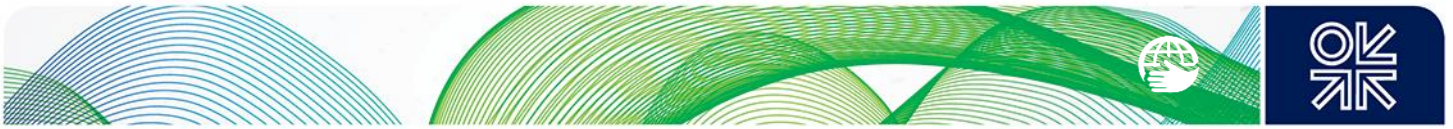
4.6 Limiting host government exposure

Project finance can assist host governments in limiting their financial commitments and exposure to clean energy projects. The project finance structure can allow host governments (whether at the national, state or more local level) to avoid direct financial undertakings (either directly through bonds or indirectly through their SOEs, as described in the next section). Rather, project sponsors and lenders rely on the project itself and its segregated dedicated assets. However, in many projects, some form of sovereign support or guarantee is provided (see, e.g., figure 6), although the scope will vary from project to project and country to country and its nature will affect the extent to which the sovereign has effectively limited its exposure.

A typical example is where power is sold to a sovereign owned energy utility. Lenders may seek an undertaking from the government to ensure that the utility will meet its future payment obligations. In other circumstances the project or its lenders may seek performance undertakings, for example regarding tariff indexation, or take comfort from a legislative framework that provides assurance that the project will be exempt from any future adverse rule changes (grandfathering). This can provide the necessary project assurance while leaving the government, and future governments, the necessary freedom to change general tax or other regimes.

Host governments will also need to assess how their contractual and other commitments in a project finance structure will be identified under IMF methodologies. But, as noted above, it is clear that the massive funding requirements for clean energy investments in MLICs exceeds the financial capability of most MLIC governments. Tapping into private investment will not overcome that problem if all the

⁴⁹ See, for example, discussion in "Boom and Bust: The fiscal implications of fossil fuel phase-out in six large emerging economies", Tara Lean, Andrea Giulio Maino, July 2022, <https://www.iisd.org/system/files/2022-07/fossil-fuel-phase-out-brics-economies.pdf>.



investment requires government guarantees. The project finance can help to some extent to meet these dual challenges of the need for finance and limited guarantee capacity.

4.7 Financing public/private joint ventures

Given the strategic importance of energy as well as the amount of funding required, public sector involvement will remain important for these projects. While projects in the US and many other OECD countries provide limited roles for government, that is not the case in many, perhaps most, MLICs, where governments look to remain engaged as owners and often as monopoly distributors, as well as regulator.⁵⁰ The IEA estimates a split of approximately 60% private, 40% public for energy investments in MLICs excluding China over 2026-2030.⁵¹

Some of these clean energy investments will involve partnerships between private and government entities. Project finance is a commonly used structure which can accommodate the differing objectives and constraints of private and public sponsors in a way acceptable to lenders. This can be particularly relevant in attracting financing for green assets segregated from the SOE's overall portfolio of mixed carbon and other assets (as described above).

4.8 Aggregating smaller projects

Mega-projects are often able to get sufficient government involvement to attract investors (e.g., Cairo metro). Smaller scale projects, typical of clean energy investment (e.g., smaller scale renewables, electric vehicle charging infrastructure) are usually more difficult, in part because the size is not sufficient to attract the attention of lenders or to warrant the set-up cost of finance. Project finance provides a structure which could be used to aggregate projects into a larger clean energy facility containing smaller distinct but similar projects (e.g., building energy efficiency, SME solar projects), that is of sufficient scale to attract finance. The experience with asset-backed securities (albeit mixed) can provide some useful insights and lessons.

4.9 Facilitating financial support from high income countries

Looking at the total clean energy investment needed across all MLICs, it is unlikely that this will happen without substantial support from high income countries, whether directly and/or through various multilateral and national international finance institutions and public international finance providers (PIFPs). Raising and structuring this level of support will be challenging, necessitating leveraging each dollar of support to the maximum. Project finance has traditionally been used to leverage such support through various means, primarily with ECAs and, for lower income countries, DFIs. It could provide the structure to substantially enhance the ability to finance clean energy projects in lower income countries.

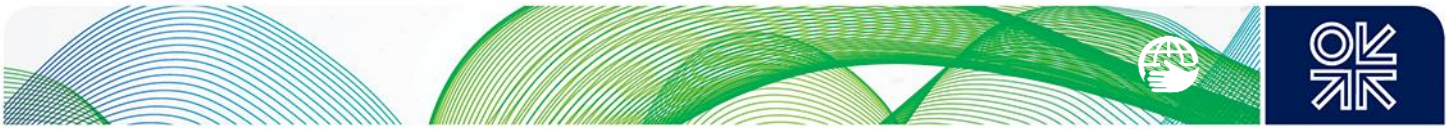
5. Opportunities

Greater use of project finance can benefit a variety of stakeholders in the clean energy transition. There is already much discussion about the policy reforms and other actions MLICs should undertake to improve their ability to attract private investment (both domestic and international),⁵² which would improve the feasibility of project and other financing structures, and this paper does not seek to repeat many of those important messages. Rather, this section looks at the “who”, namely the implications for different actors of using the project finance structure to finance clean energy investments in MLICs.

⁵⁰ See, e.g., discussion in “Engaging State-Owned Enterprises in Climate Action”, Philippe Benoit (Columbia, 2019).

⁵¹ IEA, Financing Clean Energy Transitions in Emerging and Developing Economies, June 2021; fig 2.1

⁵² This includes, for example, the World Bank's long-standing “Doing Business” reports (see, e.g., <https://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf>). Although this initiative ran into concerns (see, e.g., <https://www.reuters.com/business/world-bank-aims-replace-canceled-doing-business-report-two-years-2021-11-10/>), the initiative reflected the long-standing focus on better policies to attract private investment.



5.1 For energy companies and developers

Amongst the many challenges to decarbonisation, a major one is the organisational task of pulling together all the varied technical, economic, financial, local and political components into an integrated investible project. International energy companies and developers are highly skilled at this organisational challenge, as well as bringing credibility and many of the individual skills needed. As development needs of the energy transition take over from the needs of fossil fuel energy, there would seem to be an excellent opportunity for energy companies to profitably transition their skills to this area, and many are doing so.

5.2 For other infrastructure sponsors, including local governments

Clean energy also requires investments outside the energy supply and infrastructure sectors per se, including in buildings and transport, as well as manufacturing. Project finance can provide a vehicle for these companies to do more. This also includes projects by state-owned enterprises and other government sponsors (including in power, transport, industry and public buildings).

5.3 For MDBs, DFIs, and other PIFPs

The World Bank Group, regional development banks, DFIs and other public international finance providers (PIFPs) are very active in this area, providing valuable finance and other forms of credit enhancement to projects that would not otherwise be able to proceed. The work is time-consuming and demanding of risk capital, both of which are likely to be in short supply as demand grows. The development of innovative structures to allow the inclusion of commercial lenders and other sources of capital (including pension funds) into projects which those lenders could not otherwise support could greatly leverage the efforts of the MDBs, DFIs and other PIFPs, multiplying the amount of investment supported. By these means, more projects could be funded across the spectrum of MLIC countries, including the largest (such as China, India, Indonesia and Brazil), to less affluent ones. Moreover, to the extent that MLICs can reach the required levels of investment in the clean energy transition, all countries benefit by avoiding the more severe levels of climate change and associated damage.

5.4 For international lenders and their various advisers

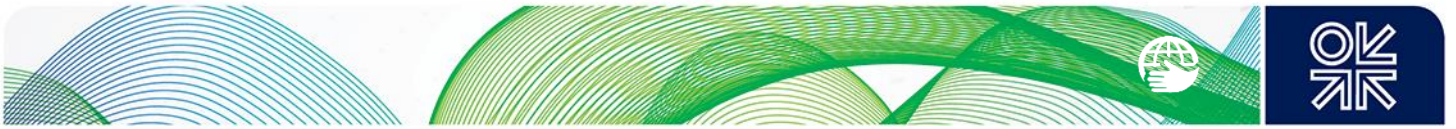
Investment in well-structured project finance across a range of MLICs can provide attractive income for commercial banks, as can the application of their expertise in advising and arranging such debt. There is a deep market amongst the investment community for sound green investments and the banks are well placed to originate and distribute well-structured clean energy project finance.

5.5 For the debt capital markets

Beside the commercial banks, there are active bond markets for project finance, and for emerging markets, but rarely for both, i.e., projects in emerging markets. Nevertheless, project finance loans have the potential to provide excellent investments for pension and insurance funds seeking stable, long-term yields, and the emergence of green bonds has shown the depth of investor appetite for sound clean energy investments. As the volume of clean energy projects in emerging markets grows, the opportunity exists for thriving bond markets both internationally and domestically in many countries. Risks need to be tightly managed towards investment grade or near investment grade to avoid prohibitive pricing, which in many countries will require a DFI or other institution to provide some risk mitigation.

5.6 For local banks and other domestic financial institutions

There are opportunities for local bank participation in clean energy project financing, if the issues of pricing and tenor can be addressed. As for many international markets, local pockets of investor interest may exist for dependable long-term income. Tapping these markets and incorporating them into the project finance may not be easy, but if achieved could be attractive for local financial institutions. Local financial institutions can also add much valuable local knowledge and understanding of the political risk, and their involvement can be seen as a means to reduce risk somewhat.



5.7 For high income donor countries

Global climate goals cannot be achieved by investment in advanced economies alone. \$100 billion per year has been pledged by developed countries to this end, and notwithstanding the challenges facing even this initial pledge, larger amounts will be needed. To the extent that project finance can increase bankable projects in MLICs, this will provide an additional avenue for this flow of funds and, crucially, may enable commercial lenders to participate alongside, thereby leveraging the valuable governmental support.

5.8 China (domestic and overseas finance) and other South/South funders

As elsewhere, project finance has the potential to support greater investment by China in clean energy, both domestically and overseas. Domestically, it can potentially mobilize funding from financial institutions interested in long-term returns, as well as promoting the green energy transition. It might also provide a vehicle to attract household savings into investment funds targeting clean energy investments, on a project-by-project or, alternatively, a portfolio basis. As noted in Section 3, the ability of project finance to target a discrete segregated set of green assets might provide an important avenue to catalyse domestic funding in China. This also applies to public sector assets, including in state-owned banks and other financial institutions.

Overseas, China can expand its use of the project finance structure under its Belt and Road Initiative (BRI) to advance clean energy investments. However, given concerns about host sovereign debt, it is important to structure the project finance approach to limit the financial exposure and debt obligations of host countries⁵³.

Even beyond China, as other MLICs continue to expand their economies, their capacity and interest to look to fund projects beyond their borders will also increase. Project finance is a way to increase the number of “bankable” projects overseas in other MLICs.

5.9 More expertise to meet the challenge

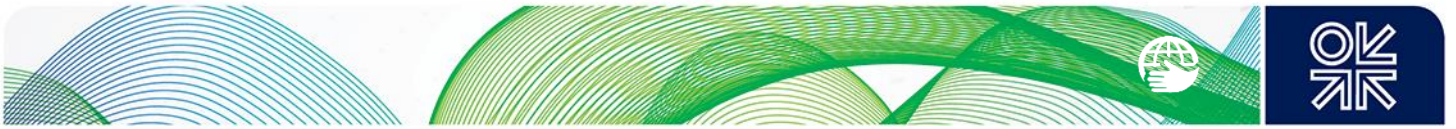
Scaling up project finance requires wider familiarity and expertise with the product and its potential to contribute to the finance of clean energy investments in the MLICs. This is true for local lenders and sponsors, but also for many international private sector financial institutions where the staff resources and expertise does not yet match that required to implement the massive increase (four to seven-fold for MLICs, excluding China) in clean energy investment. This expertise will grow as more projects are financed, and project finance will remain just one amongst other financing means including corporate finance from larger companies, sovereign debt and green bonds, for example. Nevertheless, many of these will face similar challenges where the project finance approach can help to structure effective solutions.

6. Conclusions

The world climate imperative requires a substantial increase in clean energy investments across MLICs for them to decarbonize, even as they must meet their own growing energy needs. These clean investments require a significant amount of debt finance, not only to provide liquidity but also to keep project costs manageable and the attendant energy produced affordable. While well within the capacity of global debt markets, the amounts needed are challenged by the availability of local debt finance and the risk profile, especially currency translation risk for offshore foreign debt.

Project Finance is already used extensively in financing thermal, and increasingly renewable, power projects as it can reduce funding costs (and thereby the cost of power) through the high levels of debt achievable. A key feature of project finance is its ability to segregate the assets and cash flows from

⁵³ See, for example, “Examining the Debt Implications of the Belt and Road Initiative from a Policy Perspective”, John Hurley, et. al, Center for Global Development, March 2018 (<https://www.cgdev.org/sites/default/files/examining-debt-implications-belt-and-road-initiative-policy-perspective.pdf>).



other corporate activities, as well as to mitigate risk through structuring that permits extensive disaggregation, delineation and allocation of risks. By these means it can establish a bankable project and long-term investment opportunity that is potentially attractive to a range of investors, local and foreign, where the project might otherwise be unfinanceable. The ability to unlock these benefits for clean energy projects in MLICs could substantially increase investment in this sector, thereby helping to meet global climate targets.

Project finance is used in MLICs, including low-income countries with poor credit ratings, but almost entirely for export-oriented oil and gas projects. The challenge in financing clean energy in these countries is the higher level of political risk, and the currency mismatch of funding in hard currencies when revenues are in local currency. To increase clean energy investments in MLICs, these risks need to be addressed. The most important solution to this, aside from increasing local funding, is the incorporation of structures whereby MDBs and other PIFPs provide increased support for country risks, including currency exchange risk and, where necessary, political risks. The concept of these institutions supporting commercial banks with coverage of various political risks is well established, but innovative structures are required for the specific nature of local currency domestic clean energy projects.

While global finance markets are sufficiently large, there are constraints in the availability of skilled resources, within sponsors, lenders and governments, to construct and manage complex emerging markets projects and their finance. There is a need for increased awareness of the attributes of project finance, and for the opportunities that exist in applying project finance techniques to achieving substantially more investment in clean energy in the MLICs.