Innovative Financing Models for Energy Infrastructure in Africa

Financial Innovations Lab® Report

May 2015

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Financial Innovations Labs® bring together researchers, policymakers, and business, financial, and professional practitioners to create market-based solutions to business and public-policy challenges. Using real and simulated case studies, participants consider and design alternative capital structures and then apply appropriate financial technologies to them.

Acknowledgments

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This report was prepared by Caitlin MacLean and Katie Olderman.

About the Milken Institute

A nonprofit, nonpartisan economic think tank, the Milken Institute believes in the power of finance to shape the future. The Milken Institute produces rigorous, independent economic research—and maximizes its impact by convening global leaders from the worlds of business, finance, policy, academia, and philanthropy. By fostering collaboration between the public and private sectors, we transform great ideas into action.

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Introduction

Angola, Nigeria, Ethiopia, Chad, Mozambique, and Rwanda. Large and small, politically and culturally diverse; these six countries were among the top 10 fastest-growing economies in the world over the period from 2000 to 2010.[1] The economic stars of sub-Saharan Africa, these countries have facilitated the region's tremendous growth. And this growth is projected to continue over the next decade. Industry expansion, increased foreign direct investment, and improved regulatory and fiscal management have led African countries to outpace their counterparts in other developing regions.

However, the continued growth across the continent is threatened by major development challenges, the most significant of which, it has been argued, is infrastructure. Insufficient investment in important public services such as transportation, water, and power will stunt the otherwise-impressive economic growth rates. The region's nearly $100 billion infrastructure funding gap underscores the potentially dire consequences for sub-Saharan Africa (SSA) over the next decade.[2] The significance of infrastructure for regional development cannot be overstated; established infrastructure enhances social and economic development by encouraging trade, providing employment, and promoting better health services.[3] A deficit in infrastructure severely deters foreign direct investment and reduces a regions' overall competitiveness.

Nearly $40 billion of this deficit is in the energy sector, which encompasses the extraction, generation, and distribution of traditional fossil fuels as well as renewable sources. To date, more than 600 million people, some two-thirds of the general population of sub-Saharan Africa, have no access to electricity,[4] a privation that exacts a tremendous toll on health care, education, and development. The continued challenges to providing power in SSA threaten the industrial growth that has driven the rest of the continent's economic improvements.

Traditional sources for project funding, from government allocations to private investment by equity firms and corporate investors, have not been sufficient to meet the need for energy infrastructure development. Nor can public-sector budgets, still feeling the impacts of post-2008 crisis austerity, bridge the funding gaps without increased private capital investment. Compounding the problem is the historical difficulty of attracting new investors to SSA energy infrastructure projects.

As a result, there are calls for alternative financing mechanisms, especially through new investment platforms, and for regulatory and operational alterations to improve overall market efficiency. But the key to unlocking funding that will galvanize business development is to attract more traditional investors—private equity institutions, commercial debt, and public-private partnerships—that do not yet consider the region's energy infrastructure development to be a safe and stable investment.

To address these issues, the Milken Institute, in collaboration with the U.S. Agency for International Development (USAID), convened experts from the public and private sectors for a Financial Innovations Lab in London on October 27, 2014. The daylong workshop included leaders from private equity funds, commercial banks, development finance institutions, and corporations, as well as institutional investors. Participants explored ways to improve efficiencies in transaction management and increase access to capital, and came up with concrete solutions to close the staggering funding gaps for the continent's infrastructure.

Issues and Perspectives

With sub-Saharan Africa's overall economic growth rate projected to reach 4.50 percent in 2015, the alarming infrastructure gaps facing the region must be addressed.[5] According to the Africa Infrastructure Country Diagnostic (AICD), a project published in 2008 by the World Bank that offers baselines and benchmarks of infrastructure needs and improvements, the annual funding gap for infrastructure projects in sub-Saharan Africa will surpass US$93 billion.[6]

The energy sector suffers one of the greatest gaps in infrastructure development. Daily per capita electricity use in Africa is reported to be just 124 kilowatt-hours, the equivalent of using a 100-watt bulb for three hours and about one-tenth of per capita usage elsewhere in the developing world.[7] Limited access, unreliability (including rolling blackouts), and increasing costs plague the region. Every year, companies face nearly 60 days of power outages on average across SSA. Understandably, this makes conducting business much less attractive for investors and significantly deters necessary capital flows.

Currently, most infrastructure investment in sub-Saharan Africa is financed by the public sector, either through domestic government funding or external official development assistance (ODA). Direct data on the exact amounts governments are investing in infrastructure aren't readily available, especially given the nuances and complexity of each of the 49 SSA countries. But according to the AICD figures cited by the OECD, between 2001 and 2006, official development assistance accounted for just 8 percent of US$45 billion provided to infrastructure projects.[8] The rest was primarily funded by African governments, the private sector, and other "financier" countries, such as China.[9]

Complementing domestic government allocations, multi- and bilateral organizations and development finance institutions (DFIs) like the Multilateral Investment Guarantee Agency (MIGA), the Overseas Private Investment Corporation (OPIC), the International Finance Corporation (IFC), the World Bank, and the African Development Bank also provide financing for energy infrastructure projects. These organizations play significant roles in attracting private-sector investment, as well. Since DFIs have a long track record in funding projects that both encourage sustainable development and allow for economic returns on investment, they are persuasive and compelling partners for traditional financiers. They can offer tools that play a crucial role in risk mitigation in an area where political and economic instability may be viewed as undue hazards.

As seen in table 1, DFIs utilize a variety of mechanisms, including loan guarantees, insurance, and subordinated equity, to mitigate risk and offer assurances to investors. OPIC and MIGA, for example, provide support to multiple energy projects in sub-Saharan Africa through loan guarantees and political risk insurance (PRI). Other development institutions, including the Africa Development Bank (AfDB) and the International Finance Corporation, have also had success in providing financing options such as direct loans, credit enhancements, and first-loss funds. The IFC, a member of the World Bank Group, provides substantive debt and equity financing for infrastructure projects in Africa, and helps governments design public-private partnerships for infrastructure projects.[10] Export credit agencies (ECAs) have also helped to bridge financing gaps, providing products similar to many DFIs, such as guarantees and insurance, through either a public agency, such as the U.S.'s Export-Import Bank, or a private company, such as Coface.

TABLE 1 DFI Financing Tools

Mechanism	Direct public financing or guarantee?	Debt or equity?	Risk level	Mitigates which risks?
Political risk insurance	Guarantee	Mix	Medium	Currency inconvertibility, expropriation, regulatory, political violence
Credit enhancements	Guarantee	Debt	Medium	Commercial/default risks
Full credit wrap	Guarantee	Debt	High	Credit (covers entire debt load of project)
Sovereign guarantees	Guarantee	Mix	High	Contractual, failure to pay (provided by host government)
Partial risk guarantees	Guarantee	Debt	High	Political, sovereign, contractual (provided by DFIs regarding host governments)
Direct debt financing	Direct financing	Debt	Medium	Perceived credit and political risks by commercial banks
Forex liquidity facility	Direct financing	Debt	Low	Liquidity
Portfolio guarantees/first loss	Direct financing	Equity	High	Credit, political

Source: Adapted from the Institutional Investment in Infrastructure in Emerging Markets and Developing Economies, March 2014.

Another traditional source of funding has been project finance from commercial banks, although the liquidity requirements of Basel III and other market reforms have made non-recourse lending, typical for infrastructure finance, very difficult. Standard Bank, based in South Africa, provides financing for energy deals around the continent and is currently involved in projects to increase the supply of power generation in Ethiopia, Ghana, Namibia, Nigeria, Mozambique, Zambia, and Zimbabwe.[11] Other domestic and foreign commercial banks make substantial contributions to infrastructure projects as well, including Bank of America, which recently announced a US$10 billion "Catalytic Finance Initiative" aimed at addressing the lack of available renewable energy investments.[12] The London-based Standard Chartered Bank recently agreed to double its funding to US$5 billion for USAID's Power Africa initiative, whose aim is to increase access to electricity.[13] And Rand Merchant Bank (RMB), a holding company of FirstRand Bank Ltd. in South Africa, has facilitated US$11.31 billion in African infrastructure projects over the past two decades.[14]

Examples exist as well of successful non-bank, private-sector infrastructure investment. Some corporations and private equity funds have already begun to invest on the continent, with remarkable success. In August 2014, General Electric committed to a new investment of $2 billion in energy development over the next four years for projects to advance grid reliability in Algeria and Nigeria, and to fund $1 billion in railway and power equipment in Angola.[15]

The private equity firm Blackstone has also successfully invested approximately $7 billion globally across a broad range of sectors within the energy industry.[16] Blackstone has recently partnered with one of its portfolio companies, Black Rhino, which pursues public-private infrastructure development in Africa, to identify, construct, and operate energy infrastructure projects. Blackstone is just one of the major private equity firms interested and invested in African infrastructure. As seen in table 2, The Abraaj Group and Africa Investment Infrastructure Managers (AIIM) Macquarie, based in Dubai and South Africa, respectively, are also actively investing in the continent's growth. Additionally, due to their expertise in infrastructure investments in the region, both the Abraaj Group and AIIM have committed to supporting the Power Africa initiative.[17]

TABLE 2 Africa's Largest Infrastructure-focused PE Funds

Fund	Manager	Fund vintage	Target size (mm)	Final close size (mm)	Final close date	Manager location
Abraaj Infrastructure and Growth Capital Fund	Abraaj Capital	2007	2,000 USD	2,000 USD	12/31/2007	United Arab Emirates
Actis Infrastructure Fund II	Actis	2008	1,000 USD	752 USD	9/30/2009	U.K.
IDB Infrastructure Fund	EMP Bahrain	2001	1,000 USD	731 USD	12/1/2006	Bahrain
ADCB Macquarie Infrastructure Fund	Macquarie Infrastructure and Real Assets (MIRA)	2008	1,000 USD	630 USD	12/15/2008	U.K.
Pan African Infrastructure Investment Fund II	Harith	2007	1,000 USD	630 USD	3/31/2009	South Africa
African Infrastructure Investment Fund II	African Infrastructure Investment Managers	2011	1,000 USD	500 USD	10/13/2011	South Africa
InfraMed Infrastructure	InfraMed Management	2010	1,000 EUR	385 EUR	5/21/2013	France
Mubadala Infrastructure Partners Fund	Mubadala Infrastructure Partners	2010	300 USB	425 USD	3/31/2011	United Arab Emirates
Alcazar Capital Partners Fund I	Alcazar Capital	2007	300 USD	300 USD	6/15/2008	United Arab Emirates
GCC Energy Fund	GCC Energy Fund Managers	2005	300 USD	300 USD	9/1/2006	United Arab Emirates

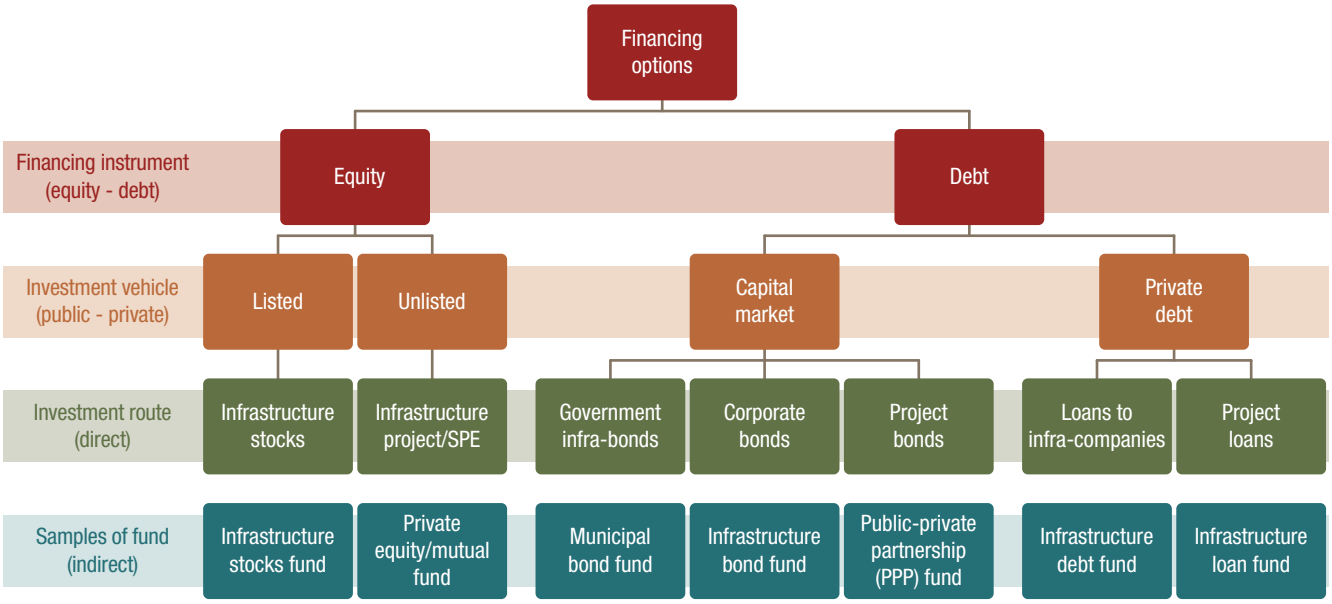
Source: Institutional Investment in Infrastructure in Emerging Markets and Developing Economies, March 2014.

Structuring project finance

Traditionally, project financing is based on the prediction of future cash flows. In the power sector, cash flows are determined by the amount of energy an independent power producer (IPP) generates and then sells to a state-owned utility or third party. To project the cash flows, developers and deal sponsors create a power purchase agreement (PPA) to facilitate the sale of the energy into a national grid or another power source. These agreements outline the terms and conditions of the sale of energy, including the price, capacity, performance, and contingencies for losses, damages, and emergencies.

Project finance is structured to include early-stage equity from deal "sponsors," usually a developer backed by a private equity firm or corporate investor, that is then supplemented by mezzanine (mid-term debt) and long-term debt provided by commercial banks, DFIs, ECAs, or public-sector funding. Typically, the project finance requires a mix of investors and debt providers to diversify away the risk to any one particular partner. Within a particular capital structure, for example, a project may receive equity investment from a private equity firm or group of investors, with an insurance wrap from a DFI and pledged debt from a bank, such as Standard Bank. Institutional investors may participate either directly or through a private equity allocation or the purchase of other financing options, such as a government infrastructure bond. As seen in figure 1, a variety of financing products and platforms are available for energy infrastructure investment.

FIGURE 1 | Infrastructure financing options



Source: Institutional Investment in Infrastructure in Emerging Markets and Developing Economies, March 2014.

Unfortunately, not all of these financing options are available in African capital markets. This is particularly true of the debt market. While some countries, like South Africa and Nigeria, have created the necessary regulatory framework to allow for a variety of fixed-income products, many countries have yet to develop an investment environment conducive to the broadest menu of options. Without robust capital markets, Lab members agreed, it would seem that direct investments would be the predominant option for investors seeking opportunities in energy infrastructure in Africa. Unfortunately, they also noted, there are still uncertainties about what investors consider "bankable" projects.

WHAT IS "BANKABLE"?

The term "bankable," i.e., credible, is frequently used to describe energy infrastructure projects. Yet a recent survey of institutional investors and other industry stakeholders conducted by the Milken Institute found that it is difficult to define bankable projects. It is challenging in part because each investor, bank, government, or developer has a different idea of what a project's risk/return profile should be. Quite simply, a bankable project should be one that a bank is willing to finance. But bank financing is only one component of the capital investment structure, and most private investors seek much higher returns on their investment. Thus, Lab participants agreed to use different terms—"financeable" or "investable"—because what looks like a strong project, with stable revenue, a suite of credit guarantees, and political risk insurance, may still only generate single-digit or mid-teen returns. This is far below the hurdle rates for risk-adjusted equity investors for frontier market projects. Every investor who responded to the Milken Institute survey was looking for at least 25 percent to 35 percent internal rate of return (IRR) if the investment is part of their private equity allocation (as opposed to the purchase of debt instruments), and of that group, a small percentage acknowledged hoping for 35 percent or more. Unfortunately, on average, energy infrastructure projects have yielded 16 percent to 18 percent IRR, based on 20-year cash flow projections.

BARRIERS TO INVESTMENT

To begin structuring bankable or investable projects that meet the desired return thresholds, participants identified major barriers to investment. In general, infrastructure projects do not lend themselves neatly to direct investment; long time horizons, complicated project planning, and coordination of multiple public- and private-sector partners make it difficult to structure deals. In Africa, additional challenges include political instability, a lack of institutional capacity for project preparation and planning, weak regulatory regimes, uncertain creditworthiness of state-owned utilities, and shallow capital markets with restricted liquidity.

Lab participants identified three major categories of risk/barriers to investment:

Credit/sovereign risk

Risks associated with a country's macroeconomic and political environment include regime change, war, clientelism, and regulatory uncertainty. Some African countries have not built up independent or impartial regulatory systems. Weak procurement laws and inefficient tendering processes can result in canceled or postponed transactions and tariffs that do not provide for inflation or changes in cost. Regulatory risks include breach of contract, regulator bias, and the inability to obtain tariff modifications as circumstances change.

At the same time, credit and political risk are often intertwined, and a power purchase agreement—the basis of the future cash flows—is only as credible as the partners involved, including any state-owned entity like a utility. And with subinvestment-grade ratings for many countries in the region, the risk of default and thus the cost of the debt can be prohibitive. Often developers will request a sovereign guarantee to ensure that the utility will fulfill its commitment to pay. Political challenges can exacerbate this challenge. Insurance products have helped mitigate some of these risks; however, the significant costs and potential delays in arranging for the guarantees can create still more challenges. Moreover, there will always be more risk than can be covered by insurance, especially because not all development financial institutions offer products that cover the critical issues around breach of contract and sovereign repayment. And unfortunately, many governments cannot provide direct guarantees, such as government contractual support agreements (GCSAs), to cover the debt because it must be counted in full as a contingent liability on their already fragile balance sheets; therefore they cannot afford to give a guarantee on every investment.

Deal implementation

Because a great deal of effort, from arranging the power purchase agreements to acquiring political and credit risk insurance, goes into the structuring of bankable deals, it can take up to seven years (the current average) to close a project in sub-Saharan Africa. Few mechanisms exist to speed up deal transactions, and bloated government structures in some countries may result in unnecessary replications of functions.

These complex projects only succeed with strong developers, experienced financiers, and astute public-sector officials. Lab participants agreed that the pool of qualified developers, those familiar with the continent and with boots on the ground, is small. At the same time, many investors (we exclude major global firms) are not well versed in the nuances of a country's energy industry and cannot appropriately assess and price the risks of a particular investment. Regional and subnational regulatory frameworks are not harmonized, making public-private partnerships inherently complex, yet few government officials have the requisite skills to execute them.

Institutional investors seek strong partners who can compensate for their own lack of expertise in assessing energy deals. As a result, many have focused on established global private equity funds or collaborations with DFIs, such as IFC and AfDB, rather than investing or co-investing directly in deals. They are reluctant to allocate toward new equity funds or directly into investments because these lack track records. Yet even prudent investors who are looking for

firms on their second or third funds will struggle to find variety in Africa, and indeed across the developing world, as the foreign investment activity is too recent to have amassed a track record of more than five to 10 years; one closed-end private equity fund can be five to seven years, let alone a second or third fund. Lab participants agreed that as the markets in Africa mature, track record will become less of an issue.

Financial risk and limited product offerings:

Apart from credit issues, investors are also concerned with financial risks, including currency/foreign exchange (FX) risks and payment delays, both of which create liquidity issues. Given the long time horizons for energy projects, any potential insurance or hedging instrument is likely to be either too expensive or not viable. Many investors cannot take liquid currency risk in Africa, nor does it make sense to always fund many of the projects in U.S. dollars, given volatile exchange rates. Partial risk guarantee products offered by DFIs have helped to alleviate some of the cost and improve viability but as yet have not been able to fully cover the long-term FX risk.

At the same time, investors have expressed interest in seeing a more diversified menu of investment options, those that can help to mitigate some of the financial risks. Because direct investments involve a whole host of challenges, especially for investors with limited experience in vetting deals, new financing products should be considered to channel capital to projects without needing intricate knowledge of project development. Without robust debt markets or tried and true equity investment funds, there is a lack of product offerings to satisfy risk/return profiles, eliminating a large number of potential investors.

Financial and Policy Solutions

The preceding challenges, however, are not insurmountable. Lab participants discussed potential financing and policy recommendations to develop a more comprehensive menu of financing options and risk-mitigation tools in order to attract the widest group of investors.

Addressing Credit/Sovereign Risks

It is easy to say that risk mitigation helps provide better return profiles. However, Lab participants agreed, not all risks can be worked around. Indeed, all investors must accept some risk to warrant their returns. But participants noted that the most prohibitive of risks require improvements to existing tools and new options for mitigation.

SOLUTION 1

ALTERNATIVES TO CURRENT RISK MITIGATION TOOLS

Sovereign guarantees have been used to protect investors against government agencies or state-owned enterprises, especially off-taker utilities, (e.g., those contracted to buy the generated power) who decide not to deliver on their contractual agreements and refuse to pay for the power distributed to their customers. Many times the utility is not creditworthy to begin with, and project developers have trouble projecting future cash flows.

Sovereign guarantees also pose a challenge to the governments that, broadly speaking, are not as creditworthy as those of developed countries. They operate on massive deficits, and despite recent success in offering sovereign bonds, need to manage their debt and cannot afford to have contingent liabilities on their balance sheets. Lab participants discussed alternative forms of guarantees or payment structures to ensure that a project has stable cash flows.

Put/call option

To avoid having additional contingent liabilities on government balance sheets, project developers and their investment sponsors who structure the financing deal could use a recently created model that is similar to a put/call option. This would function as a guaranteed sale of the power plant to the government at a certain price if the off-taker doesn't pay as scheduled. This option would have no effect on the balance sheet, as the liability and asset would be booked at the same time, and thus would not affect a country's credit rating. It would also secure a guaranteed market for energy generators if a utility fails to pay.

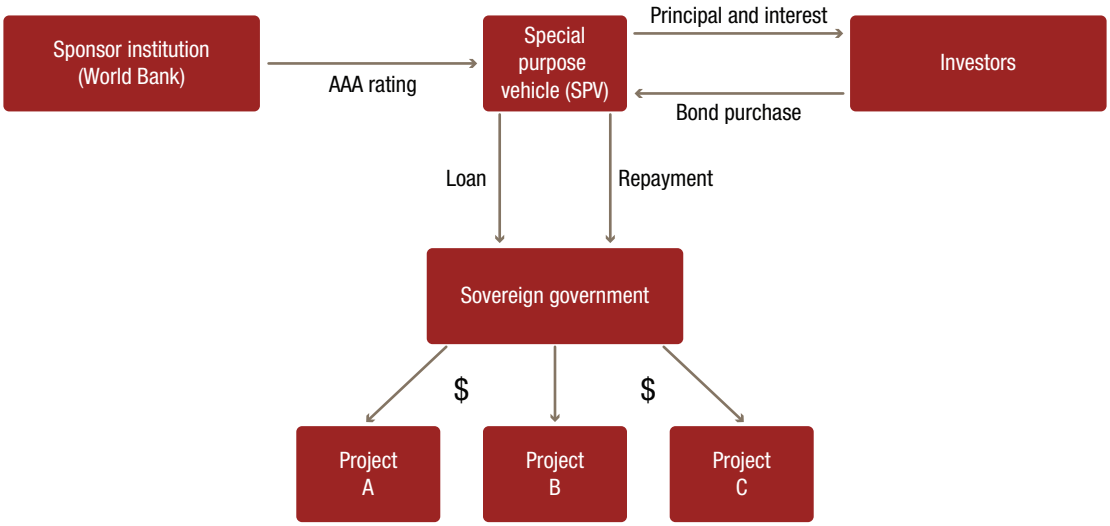
The model was first applied to an independent power plant in Nigeria developed by the U.S. based Azura Energy Systems Inc. in response to the government's reluctance to take a sovereign guarantee onto its balance sheet. Lab participants recommended that more information be gathered regarding this case and its outcomes, for potential use as a model for other governments moving forward.

"Sponsor" rating model

If the creditworthiness of the sovereign is a barrier to investment, then another emerging model is available, using a sponsor for the sovereign to issue debt that would be repaid through a loan to the sovereign. For example, the World Bank could issue a $200 million bond offering, and the funding would go to infrastructure projects in Nigeria, as seen in figure 2. The Nigerian government would repay the World Bank to cover the bond. The World Bank's AAA credit rating would be more attractive and allow for cheaper capital than would Nigeria's S&P BB-/B rating (as of late 2014). And the issuance could be used as a pilot that could be scaled up by other multilateral banks,

depending on the capacity on their balance sheets. This model has been effectively used by the World Bank through its green bond issuances—a sponsor bond that is used to support environmentally focused projects in developing countries. Based on this experience, a new type of bond could be issued for country-specific infrastructure projects.

FIGURE 2 Leveraging a sponsor credit rating



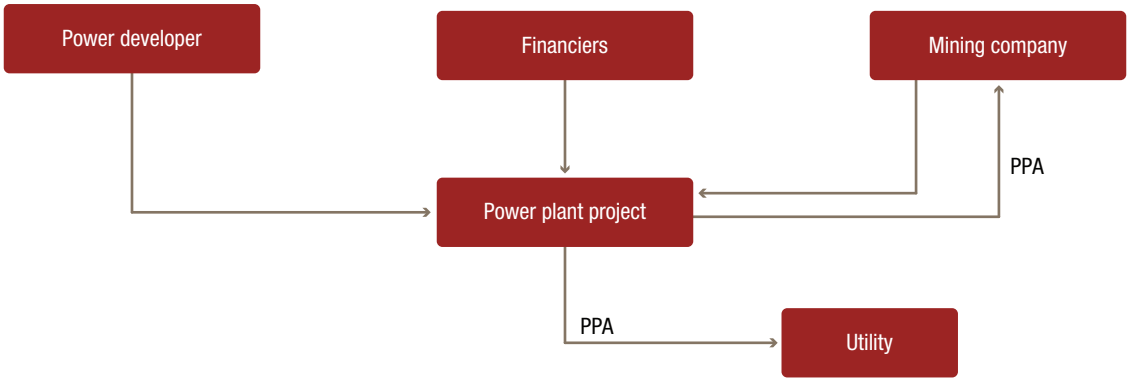
Source: Milken Institute.

Shared-use infrastructure

Because energy projects are dependent on off-takers (sellers along the distribution chain) for repayment, revenue is entirely linked to the creditworthiness of the utility or other partner. However, some models for infrastructure funding can diversify the potential "payers" to include other companies that would benefit from the development of the new energy asset. Most practically, this has worked with small, off-grid energy generators, such as solar plants, which can be built for a group of companies that pay for the power. But larger, independent power producers that need to sell into the grid could create contracts with companies other than utilities that would benefit from the additional energy, but who may or may not buy the power directly from the independent power producer. Regulations in some African countries allow for IPPs to sell power directly to large industrial partners. This concept of shared-use infrastructure can enhance the risk profile of the IPP lowering capital costs, and allowing for competitive power rates.

The best example of this potential partnership is with mining companies in sub-Saharan Africa, as modeled in figure 3. Mining companies have explored options for power generation, including partnering with different mines or companies from other area industries to invest in a power plant connected to the grid or, alternatively, forming a direct relationship with a power producer to serve as a principal off-taker. In the last case, the mining company could create a joint venture with the IPP that would sell both back to the company and to the designated utilities to diversify revenues and work around the total dependence on the creditworthiness of the utility.

FIGURE 3 | Potential shared-use model



Source: Vale Columbia Center on Sustainable International Investment.

Improving Deal Implementation

According to various Lab participants, deal execution for projects in Asia and Latin America averages around 12 months. For African countries, that same execution can take anywhere from 30 to 72 months. The legal, administrative, and operational costs associated with the additional time can make a bankable project no longer bankable.

The delays are due in part to the inherent nature of public-private partnerships—which involve multiple jurisdictions, governments—or DFI funding tools, and private-sector investors who are not energy experts and who must still perform due diligence. Recent efforts, such as AfDB's Africa50 initiative, have tried to address these issues through technical assistance and knowledge sharing. Lab participants developed a series of solutions that may also serve to improve market efficiency and streamline processes to attract new investment.

SOLUTION 2

DEVELOP MORE EFFECTIVE RATING SYSTEMS

The developers of energy projects could pay for a rating agency to assign grades to projects, much as the agencies do for governments and various financial products. Unfortunately, for a power plant or collection of pipelines in Africa, the costs associated with securing a rating from an S&P or Moody's are too high because of the due diligence needed for an agency to vet each unique, individual project. Lab participants discussed potential options for projects, funds, and investors involving the creation of a shadow rating system through a new system of metrics specific to the African energy markets.

Currently, investors use various indexes as benchmarks for the strength and creditworthiness of an investment. Bloomberg's "New Energy Finance" compiles both sector- and region-specific renewable energy indexes that list a company's exposure rating through a "proprietary clean-energy exposure ratings system," according to its website. However, the current indexes track only the most active companies in clean energy. This would omit projects generating fossil fuel-based energy, as well as small and mid-size firms.

Lab participants discussed a new rating system that would incorporate data from established indexes, such as Bloomberg or the World Bank, and create an independent shadow rating that would be based on a diverse set of metrics. Participants agreed that a rating system that could assess projects across the entire energy spectrum, as well as across countries and regions in Africa, would enable investors to quickly compare benchmarks for each project and expedite the due diligence process.

SOLUTION 3

CREATE STANDARDIZATION AROUND PPAs

Power purchase agreements are critical to securing project financing, as they represent the future cash flows of a new plant or energy station. The complexity of the agreements can translate into hundreds of pages of documents and can take years to negotiate, adding to the overall transaction costs.[18]

Lab participants discussed the importance of standardization in order to mitigate some of the costly delays and fees associated with PPAs. Efforts are under way with various development finance institutions and donor agencies, such as the African Development Bank and USAID, to work with African governments and independent power providers to create a framework for future standardization. As seen in table 3, the World Bank has put together a blueprint for creating power purchase agreements, as well as some of the language to incorporate.

TABLE 3 World Bank Outline for PPAs

1. Definitions	**8. Project operation**
Defines terms of parties and PPA.	*8.1 Schedule outages and maintenance outages*
2. Sale of capacity and energy	*8.2 Operation; dispatch*
2.1 Obligations to provide contractual capacity and electrical output.	Outlines procedures for operations and dispatch as to the output from the plant and instructions as to the overall system condition.
Specific terms and timing for energy units to be purchased.	*8.3 Emergency plans; supplier power and emergency*
2.2 Obligation to pay for available capacity and electrical output.	Contingency plans for emergencies, such as blackouts.
Designated monthly tariffs to be paid by the utility, usually in two parts, to cover the fixed costs and the energy/fuel charges.	*8.4 Record maintenance*
2.3 Third-party sales	*8.5 Interconnection, metering standards, and testing*
Allowance for sale of energy to third parties, especially if the creditworthiness of the utility/purchaser is in question.	**9. Payment**
2.4 Demand commissioning; deemed generation	*9.1 Invoicing*
Provisions for capacity that was not available because of *force majeure* events, such as incomplete transmission facilities etc.	Include monthly tariffs payment schedule as well as invoicing and payment instructions.
2.5 Liquidated damages	*9.2 Security for payment*
Payments to the utility/purchaser from the company based on damages from delays or underperformance.	Could include bank letters of credit or guarantees for the utility/purchaser.
2.6 Testing performance	**10. Liability and indemnification**
Confirmed levels of capacity, as well as the reliability and fuel efficiency, certified by an independent engineer.	**11. *Force majeure***
2.7 Company's purchase of power; pre-commissioning power	*11.1 Categories*
Publication on the part of the utilities/purchaser to provide the company with the energy needed to finish construction, startup, and testing.	To avoid contention around definitions, categories of *force majeure* events are outlined, including war, natural disasters, external political factors, etc.
3. Conditions precedent	*11.2 Notices/duty to mitigate*
Conditions necessary to meet each party's contractual obligations, including assurance of government guarantees.	*11.3 Effect on obligations*
4. Pre-operation period	*11.4 Buyout consequences of force majeure events*
Obligations to obtain any necessary consent and approvals, as well as activities such as selecting construction contractors, operators, and the day-to-day procedures	**12. Taxes**
5. Terms and termination	Taxes are generally passed through the terrace to the utility/purchaser
5.1 Terms	**13. Change in law**
5.2 Termination (including dissolution or failures to pay by the utility/ purchaser, breaches of contract, as well buyouts)	Impact of changes in law on the tariff, Including protection for certain allocations of cash flow.
5.3 Buyout price	**14. Dispute resolution**
Agreed-upon provisions in the event of a termination event (a buyout by either the utilities/purchaser or a third-party party).	**15. Notices**
6. Representation and warranty	**16. Miscellaneous**
7. Undertakings	
Includes additional covenants from each party: for the company, it could be reasonable effort to find the best construction contract or fuel supply agreement and for the utility/purchaser, a reasonable effort to identify and prepare for government authorization.	

Source: Michel Kerf et al., "Concessions for infrastructure: A guide to their design and award," Technical Paper No. 399, p. 160–172, World Bank, 1998.

Participants agreed that creating standardized agreements would take a significant time, capital, and expertise, and could be best addressed by bi- and multilateral aid agencies or development finance institutions.

Increasing the Variety Of Product Offerings

Participants agreed that the current investment offerings of the energy infrastructure market are not varied enough or structured into products familiar to global investors, and that those offerings fail to attract the widest variety of investors into this expanding market.

SOLUTION 4

ESTABLISH INFRASTRUCTURE-FOCUSED PRIVATE EQUITY FUNDS

Most major private equity firms and financial institutions include infrastructure funds in their portfolios. Yet very few infrastructure-focused funds exist for Africa. Lab participants discussed how creating infrastructure-focused funds within established firms could bring much-needed regional expertise while piggybacking on the credibility and track record that comes from the parent company. Infrastructure-focused funds could also provide longer-term capital, helping to facilitate an exit for the initial project sponsor. In providing an alternative platform for liquidity, the funds could function as a synthetic capital market. The certainty around exits could in turn help to reduce the risk-adjusted returns expected by the early-stage private equity investors. At the same time, the funds could leverage the expertise and track record of the parent firm to improve deal implementation, speeding time to financial close and overcoming procedural barriers.

SOLUTION 5

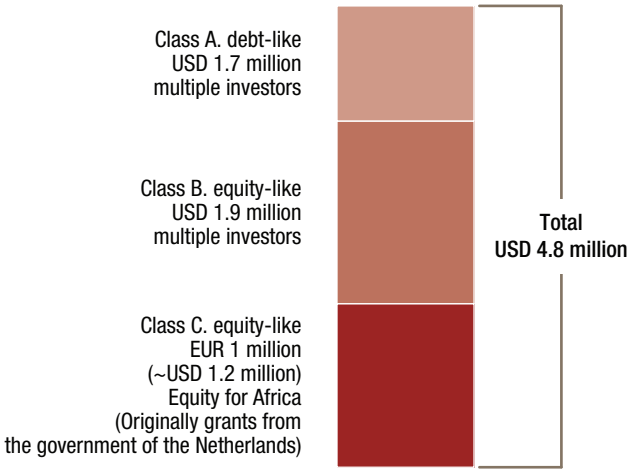
DEVELOP STRUCTURED PORTFOLIO OPTIONS

Structured finance options allow investors to participate in different tranches of an investment or portfolio, based on their risk/return profiles. New models have come from the African Development Bank and elsewhere. Lab participants discussed the need for a wider variety of funds, with options for junior, mezzanine, and senior debt, as well as equity and potentially first-loss/junior equity positions.

The AfDB has structured a risk-sharing model that would synthetically transfer part of its portfolio into a special purpose vehicle (SPV) that would issue securities to institutional investors. Currently, the bank has a strong track record with its infrastructure investments, and thus would structure the SPV from the investments in its portfolio already generating cash flow, with a potential to include greenfield projects in a later iteration. The vertical risk sharing would allow the bank to attract new capital while providing investors with recognizable products and a strong performance record.

Taking a first-loss position in a fund also allows for more efficient risk sharing. Apart from guarantees and loan-loss reserves, which pledge capital in the case of default but are not structured to participate in returns, taking a junior position can meet a DFI's needs to attract new investors while sharing in the potential upside of the investments. Structuring funds that have additional tranches of subordinated capital, either debt or equity, could transform unattractive investments into viable opportunities in the global capital markets, as has been seen in examples in the U.S., Tanzania, and Australia.[19] Figure 4 shows an example of a fund capitalized by FMO, the Dutch development bank, to reduce poverty in Tanzania by providing technical assistance to entrepreneurs.

FIGURE 4 First-loss structure: PEAK Fund



Source: Rockefeller Foundation.

Not all development finance institutions are set up to participate in first-loss positions; OPIC cannot, for example, while other agencies, like the U.K.'s Department for International Development and the World Bank Group's International Finance Corporation, can.[20] However, Lab participants agreed, first-loss capital could be a bridge between investor needs for returns and the potential upside from infrastructure investments.

SOLUTION 6

CREATE NEW FIXED-INCOME PRODUCTS

Given the interest from Lab participants, especially the institutional investors present, in more variety of infrastructure financing products, one part of the discussion was focused on new fixed-income options that could be applicable to Africa's market. Based on successful debt offerings in both developed and developing countries, Lab participants reviewed various bond models that would benefit energy infrastructure projects.

Infrastructure project bonds

Project bonds have been used in the U.S. and Europe to finance infrastructure projects. The debt can be government-issued or a corporate offering; until the global financial crisis, these bonds were "wrapped" with monoline insurance as a credit enhancement. After 2008, the monoline industry collapsed due to the participation of these insurers in the subprime market, with only a few multilateral development banks willing to provide the insurance.[21] Project bonds have also been used in developing markets, particularly in Central and South America, and are an increasingly attractive financing option for African countries, as Basel III conditions make bank lending more difficult and public-sector funds are limited.

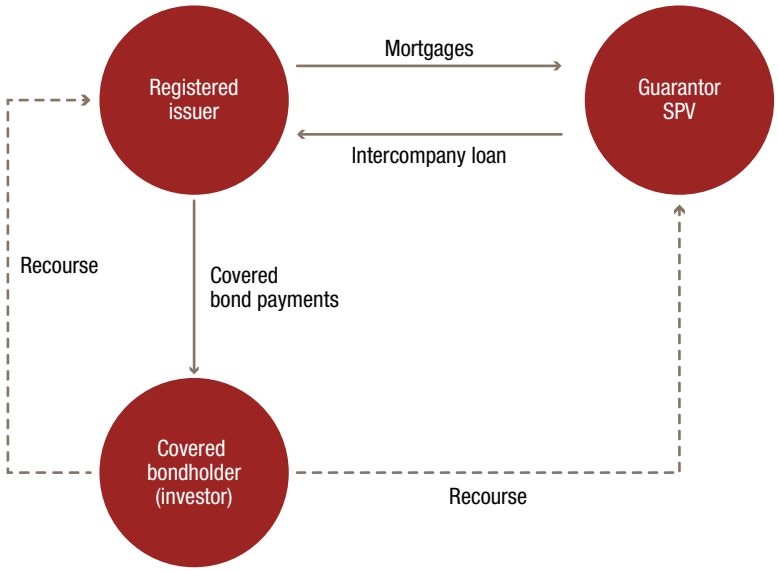
The bonds are typically issued by an SPV for a standalone project and repaid from the cash flows of that project. Nigeria and Kenya have successfully issued infrastructure bonds, thanks in part to the conditions of their markets (corporate bonds are tax-free in Nigeria, for example).[22] In recent years, to make up for the diminished monoline insurance market, development banks have offered alternative forms of credit enhancement. In 2012 the European Investment Bank launched the Project Bonds Credit Enhancement program, which works to bolster the credit ratings of the project bonds through either a loan to the project company or a contingent line of credit to cover either the senior debt service or construction overruns.[23]

While many African countries lag in capital market development behind Nigeria, Kenya, and South Africa, Lab participants agreed that new types of debt used in other markets should be pursued in the region. And although challenges remain, it is clear that as the market matures, these bonds could be extremely attractive alternatives for project funding.

Covered bonds

Should capital markets deepen across Africa, another fixed-income product could be adapted to support energy infrastructure. Covered bonds, historically used in Europe, are securities that are backed by a pool of loans, as seen in figure 5. Unlike mortgage-backed securities issued in the U.S., covered bonds stay on the credit issuer's balance sheet, ensuring that there is still skin in the game. And because the issuer maintains ownership, the loans within the cover pool can be switched out, depending on their performance.

FIGURE 5 Typical covered bond



Source: Canada Mortgage and Housing Corporation.

The bonds are attractive because of the double recourse they offer to both the issuer and the pool of loans itself (usually an SPV). In addition, the diversification of the pool can help mitigate the impact of project default. Banks in Europe, as well as in emerging markets, have moved toward the bonds because the retained ownership removes compliance issues with Basel III.

Covered bonds could be attractive to energy infrastructure developers. The securities are typically highly rated because of the underlying creditworthiness of the issuer, which could lower the cost of capital for the projects, especially those too small to attract bond interest. With some similarities to the AfDB risk-sharing model described above, covered bonds could offer investors a new way to invest in infrastructure in Africa.

Public-sector appetite for these types of securities has traditionally been weak in Africa, with South Africa recently declining to include new legislation to support their use. However, North African countries have begun to take steps to create a regulatory environment more conducive to covered bonds.[24] As the capital markets develop, covered bonds could be successful debt products to mobilize investment in energy infrastructure.

Conclusion

The case for investing in energy infrastructure in Africa is clear. To sustain economic growth and ensure long-term prosperity, significant investment is needed, and quickly. Public-sector funding is constrained, and tightened restrictions on commercial bank lending have severely curtailed traditional project financing. Yet new financing models are beginning to attract private capital.

To bridge the funding gap and to appeal to a wider variety of investors, Lab participants agreed that new solutions must:

- address credit/sovereign risk
- improve deal implementation and time to completion
- mitigate financial risk through increased variety of product offerings.

From the standardization of power purchase agreements to the use of covered bonds, the ideas generated at the Lab can be used by governments, developers, and investors to begin to structure new investments and better develop the overall market.

Financing energy infrastructure is not a one-size-fits-all exercise; what works for one country or one project may not work for another. Consequently, it is imperative to develop a diverse menu of options to access capital. With new investment, infrastructure can be leveraged to spur new economic and social development well into the future.

APPENDIX

Financial Innovations Lab Participants

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ENDNOTES

1. "Africa's Impressive Growth," *The Economist*, January 6, 2011, http://www.economist.com/blogs/dailychart/2011/01/daily_chart (accessed December 15, 2014).

2. Brixiova Zuzana, Emelly Mutambatsere, Cecile Ambert, and Dominique Etienne, "Closing Africa's Infrastructure Gap: Innovative Financing and Risks," African Development Bank, April 2011, Vol. 2 Issue 1.

3. Inderst, George, and Fiona Stewart, "Institutional Investment in Infrastructure in Emerging Markets and Developing Economies," Public-Private Infrastructure Advisory Facility (PPIAF). March 2014, p. 1.

4. "Leveraging Partnerships to Increase Access to Power in Sub-Saharan Africa," *Power Africa Overview*, November 2014, http://www.usaid.gov/sites/default/files/documents/1860/power-africa-overview-11-6-2014.pdf (accessed January10, 2015).

5. "World Economic Outlook," International Monetary Fund, April 2015.

6. Kingombe, Christian K.M., "Mapping the New Infrastructure Financing Landscape," Overseas Development Institute. April 2011.

7. "The World Bank Fact Sheet: Infrastructure in Sub-Saharan Africa" http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/0,,contentMDK:21951811~pagePK:146736~piPK:146830~theSitePK:258644,00.html (accessed January 10, 2015).

8. "Mapping Support for Africa's Infrastructure Investment," Organization for Economic Cooperation and Development (OECD), 2012, p. 10, http://www.oecd.org/daf/inv/investment-policy/MappingReportWeb.pdf (accessed January 10, 2015).

9. Ibid.

10. "IFC in Infrastructure," fact sheet, International Finance Corporation, http://www.ifc.org/wps/wcm/connect/e692c80045edcb21bcdebd9916182e35/AM2014_IFCIssueBrief_Infrastructure.pdf?MOD=AJPERES (accessed December 15, 2014).

11. "Financing Infrastructure and Energy Needs," Standard Bank, Global Reporting Initiative, 2014. http://sustainability.standardbank.com/socioeconomic/financing-infrastructure-and-energy-needs (accessed December 16, 2014).

12. "Bank of America Announces $10 Billion Catalytic Finance Initiative to Accelerate Clean Energy Investments That Reduce Carbon Emissions," Bank of America Newsroom, September 23, 2014. http://newsroom.bankofamerica.com/press-releases/corporate-and-investment-banking-sales-and-trading-treasury-services/bank-america-ann (accessed December 15, 2014).

13. "Standard Charter More than Doubles Commitment to Power Africa to $5 bn," Business Day, August 1, 2014,. http://businessdayonline.com/2014/08/standard-chartered-more-than-doubles-commitment-to-power-africa-to-5bn/#.VK7IRCvF98E (accessed December 15, 2014).

14. "RMB At Work: Fuelling Growth in Africa," "Infrastructure and Transport Sector," Rand Merchant Bank,, http://www.rmb.co.za/international/africa.asp (accessed January 10, 2015).

15. "GE Pledges $2 Billion to Boost African Energy Infrastructure," August 4, 2014, *Fortune*. http://fortune.com/2014/08/04/ge-pledges-2-billion-for-african-energy/ (accessed January 10, 2015).

16. "Blackstone-Backed Black Rhino and Dangote Industries to Invest $5 Billion in African Energy Infrastructure Projects," August 5, 2014, press release, http://www.blackstone.com/news-views/press-releases/details/blackstone-backed-black-rhino-and-dangote-industries-to-invest-5-billion-in-african-energy-infrastructure-projects (accessed December 15, 2014).

17. "Power Africa: Private Sector," USAID, http://www.usaid.gov/powerafrica/partners/private-sector (accessed January 10, 2015).

18. Wesoff, Eric, "Anatomy of a Power Purchase Agreement," May 12, 2010, http://www.greentechmedia.com/articles/read/anatomy-of-a-power-purchase-agreement (accessed January 5, 2015).

19. "Catalytic First-Loss Capital," Issues Brief, Rockefeller Foundation: October 2013, http://www.thegiin.org/binary-data/RESOURCE/download_file/000/000/552-1.pdf (accessed January 6, 2015).

20. Leo, Benjamin, Todd Moss, and Beth Schwanke, "OPIC Unleashed: Strengthening U.S. Tools to Promote Private-Sector Development Overseas," Center for Global Development, August 2013.

21. Georg Inderst and Fiona Stewart, "Institutional Investment in Infrastructure in Developing Countries Introduction to Potential Models," World Bank: Policy Research Working Paper 6780, 2015, http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6780 (accessed January 20. 2015).

22. "Project Bonds: An Alternative Source of Financing Infrastructure Projects," Deloitte, http://www2.deloitte.com/za/en/pages/finance/articles/project-bonds-an-alternative-to-financing-infrastructure-projects.html (accessed on January 6, 2015).

23. "An Outline Guide to Project Bonds Credit Enhancement and the Project Bond Initiative," European Investment Bank: December 2012, http://www.eib.org/attachments/documents/project_bonds_guide_en.pdf (accessed January 6, 2015).

24. Calmarza, Augustin Martin, "Covered Bonds: The Road to a Global Asset Class," July 1, 2013, http://www.iflr.com/Article/3229362/Covered-bonds-the-road-to-a-global-asset-class.html (accessed January 6, 2015).

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