

THE BOTTOM LINE

Private financing and private participation in service delivery will be required if Sub-Saharan Africa is to achieve affordable, reliable, sustainable, and modern energy for all by 2030. To find out how to elicit private interest in power sector investments in the region, we surveyed 51 private investors and financiers. The results indicate that investors perceive three segments of the market—power generation, off-grid electrification, and mini-grids—as ready for private solutions. The results provide insights for governments and development partners.

Attracting Private Participation and Financing in the Power Sector in Sub-Saharan Africa: Findings from a Survey of Investors and Financiers

What does it take to attract private sector interest in Sub-Saharan Africa's power sector?

Sub-Saharan Africa faces investment needs in the hundreds of billions to achieve affordable, reliable, sustainable, and modern energy for all by 2030

Fifty-seven percent of the population—around 600 million people—lack access to electricity, and continuous power outages constrain the economic performance of those already connected to the grid (Cozzi and others 2018; Blimpo and Cosgrove-Davies 2019). Tax revenue and development finance are unlikely to be sufficient to close this investment gap, and rising concerns about debt distress

in the developing world limit the scope to take on more public debt (Gaspar and others 2019).

It is widely understood that private solutions—defined here as private sector participation in service delivery or private financing—can help fill the investment gap if structured to minimize sovereign obligations and contingent liabilities to private investors (Eberhard and others 2016). What is less widely understood is what constitutes suitable conditions for attracting private solutions, including the relative importance of different risk factors related to the policy and regulatory framework, the sector context, and the country context (Waissbein and others 2013).

How was the survey structured?

A risk factor–based framework was used to structure the survey

Following Waissbein and others (2013), we used a framework that distinguished 10 risk factors, grouped into three categories, to evaluate the attractiveness of the investment environment in the power sector (table 1). The first category—policy and regulatory risk factors—includes the ease of market entry and exit, the clarity of investment priorities, and the certainty of cash flows. The second category—risk factors related to the wider sector context—includes the sectoral track record of private solutions, sectoral growth (demand and supply), and private investors' own track record in the sector. The third category—country context risk factors—captures the wider governance and political environment, the macroeconomic



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How are different countries in Sub-Saharan Africa perceived in terms of past investment experience and prospects for new investments?

Table 1. Risk factors affecting the attractiveness of the investment environment to the private sector

	Risk factor	Explanation
Policy and regulatory risk factors	1. Ease of market entry	Risks related to licensing, procurement/tendering, and general legal framework affecting investors' ability to enter the market
	2. Clarity of investment priorities	Risks related to government plans for electrification, generation, and transmission expansion and required technical standards
	3. Certainty of cash flow	Risks related to recovery of costs and investment returns, ability to enforce payment discipline, and government support
Power sector context risk factors	4. Sectoral track record	Risks related to past experiences/lack of track record in the power sector, such as no/few IPPs and low investment volumes
	5. Sectoral growth	Risks related to market size and prospective demand growth in the power sector, such as low electrification rates and population growth
	6. Firm's personal track record and access	Risks related to a firm's lack of experience in the power sector of a given country, such as no/limited access to relevant decision makers
Country context risk factors	7. Governance and political risk	Risks related to high political instability, poor governance, poor rule of law, and poor institutions
	8. Business environment	Risks related to the country's integration into the international economy, as indicated by access to international financing
	9. Macroeconomic framework	Risks related to economic growth, currency convertibility and transferability, fiscal discipline, and sovereign debt rating
	10. Banking and capital markets	Risks related to the efficiency, depth, and track record of local banking and capital markets, such as access to local debt and equity finance

framework, the business environment, and the state of domestic banking and capital markets.

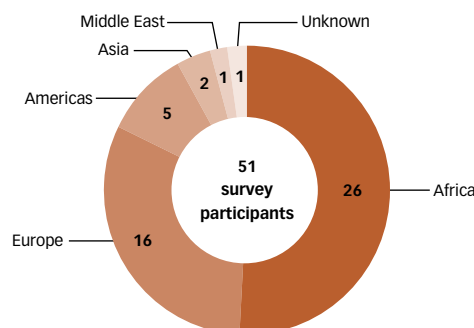
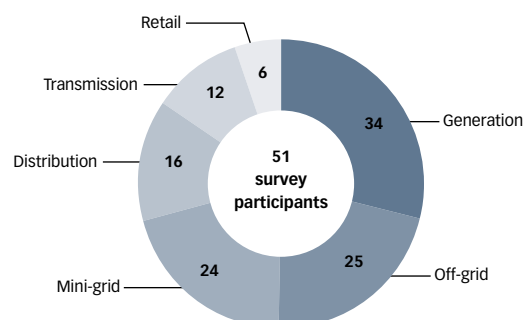
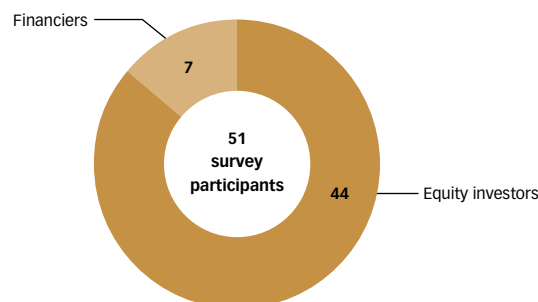
The survey focused on three sets of questions:

- How important are different risks when evaluating a new power sector investment?
- How ready are different segments of the power sector for private solutions?
- How are different countries in Sub-Saharan Africa perceived in terms of past investment experience and prospects for new investments?

Fifty-one private investors and financiers responded to the survey, which was conducted between January and May 2019. The

sample covered all segments of the power sector (power generation, transmission, distribution, and off-grid and mini-grid solutions) and both international and local respondents (figure 1). To triangulate the results, we complemented the survey with quantitative and qualitative data collated from public and World Bank sources.

To ensure that participants did not provide responses on countries and market segments with which they were not familiar, we allowed them to choose which countries and segments to rate in terms of readiness for private sector participation. Doing so created potential for selection bias (if, for example, participants provided their opinions only in the most extreme cases). Our results indicate that the willingness of investors to rate a country was not correlated with the country's perceived or actual readiness, however.

Figure 1. Characteristics of survey respondents**a. Half of survey respondents are incorporated in Africa****b. Participants are mainly active in generation and off/mini-grid****c. Most participants are equity investors**

Note: Investors may fall into more than one category, causing totals to exceed 51.

Among country context risks, governance and political risks are the most critical, followed by the general business environment and the macroeconomic framework.

How important are different risks when evaluating a new power sector investment?

Investors and financiers assign the greatest importance to policy and regulatory risks, followed by country context risks and risks related to the wider power sector context

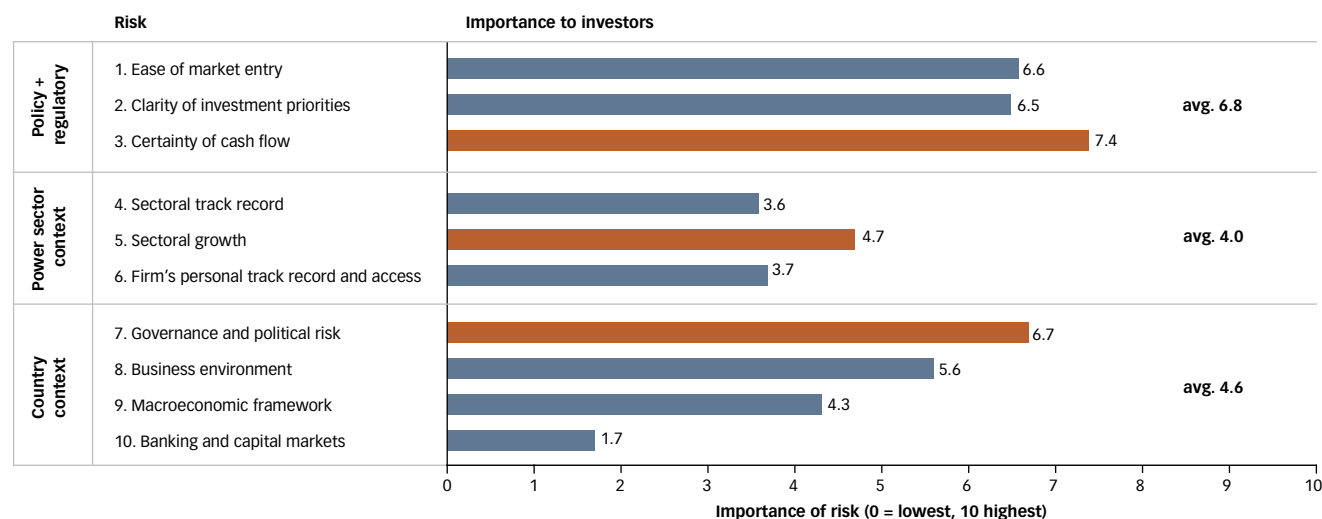
The risk appraisals of investors and financiers are detailed in figure 2. Among power sector policy and regulatory risks, the certainty of cash flow (avg. 7.4) is the most important factor for respondents, with ease of market entry (avg. 6.6) and clarity of investment priorities (avg. 6.5) following closely behind. Among power sector context risks, respondents rank sectoral growth potential as the most important (avg. 4.7); neither investors' own track record (avg. 3.7) nor the sectoral track record (avg. 3.6) rank as important. Among country context risks, governance and political risks are the most critical (avg. 6.7), followed by the general business environment (avg. 5.6) and the macroeconomic framework (avg. 4.3). Risks related to banking and capital markets are not considered important (avg. 1.7), possibly because many respondents rely solely on international sources of finance. This finding suggests that there is still a long way to go in developing local markets for infrastructure financing, which will be needed as the market matures and scales up.

Several other key messages emerge when comparing subgroups of respondents:

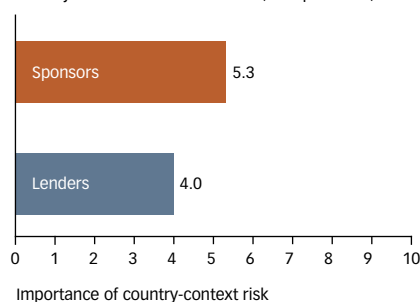
- Financiers (debt providers) assign less weight to country context risks than sponsors (equity investors), possibly because lenders are more likely to recover their investments than equity investors and are better able to ringfence their investments.
- Domestic investors assign less weight to country context risks than international investors, likely because they are less exposed to exchange rate-related risks and are better able to mitigate country-specific risks.

Figure 2. Relative importance of different categories of risk to survey respondents**a. Relative importance of different risk factors**

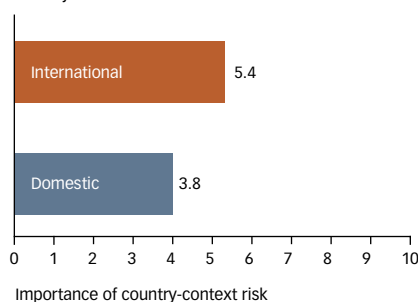
The average investor assigns the greatest importance to policy and regulatory risks (avg. 6.8), followed by country context (avg. 4.6) and power sector context (avg. 4.0)

**b. Perception of country-context risks, by type of investor**

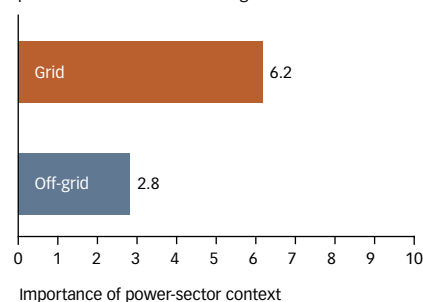
Sponsors (equity providers) assign more weight to country-context risk than lenders (debt providers)



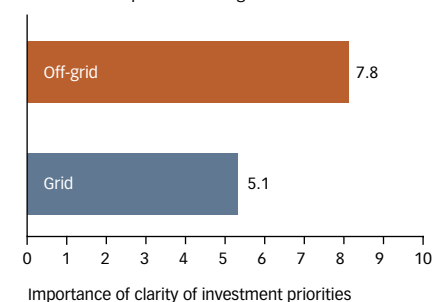
International investors assign more weight to country-context risk than domestic investors

**c. Importance of wider power sector context**

Grid investors assign more weight to the power-sector context than off-grid investors

**d. Importance of clarity of investment priorities**

Off-grid investors assign more weight to clarity of investment priorities than grid investors



Note: Respondents were asked to rank the three categories and the risk factors within them. The results were converted to a 1–10 scale.

On balance, investors' and financiers' experiences in the power sector in Sub-Saharan Africa have been positive.

- Grid investors assign more weight to power sector context risks than off-grid investors, likely because off-grid investors are less affected by grid-based risks, which drive the power sector context.
- Off-grid investors assign more weight to clarity of investment priorities than grid investors, possibly because off-grid investors' business models may be substantially influenced by the expansion of the conventional grid.

How ready is Sub-Saharan Africa's power sector for private solutions?

The readiness of the power sector in Sub-Saharan Africa for private solutions was evaluated in two ways

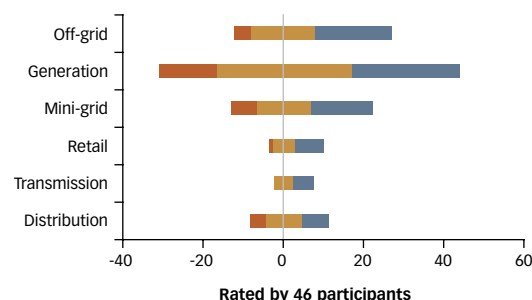
We asked respondents to rate their past investment experience in different segments of the power sector and to share their perceptions of prospective investment readiness in the next three years (figure 3). The survey results suggest that, on average, investors' and financiers' experiences in the power sector in Sub-Saharan Africa

have been positive. When asked to evaluate previous investments, 42 percent of respondents evaluated their experiences in the power sector in Sub-Saharan Africa as positive, with just 15 percent reporting negative experiences (43 percent reported mixed experience). Most respondents indicated past investment experience in the off-grid, mini-grid, and generation segments; only a few reported experiences in transmission, distribution, or retail supply. There was no substantial difference in the evaluation of different segments; the largest share of positive assessments of past experiences were in the retail supply (54 percent), transmission (50 percent), and off-grid (49 percent) segments. (The number of responses for retail supply and transmission was limited, as only a few investors had had experience in these sectors, likely because of the low perceived readiness of these market segments.)

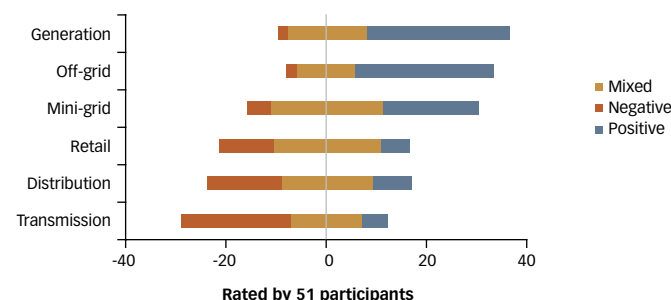
Looking forward, the results suggest that readiness for private sector solutions in the power sector differs substantially across sector segments. Grid generation, off-grid, and mini-grids were rated as more ready for private participation than retail supply, distribution, and transmission.

Figure 3. Readiness for private investment of different power sector segments in Sub-Saharan Africa

a. Retrospective evaluation of investment experience



b. Prospective perception of investment readiness



Readiness for private sector solutions in the power sector differs substantially across sector segments.

How does the private sector perceive different countries in Sub-Saharan Africa?

Several countries in Sub-Saharan Africa attracted substantial private investment in their power sector over the past decade

We asked investors to evaluate their experiences in countries in which they had invested. Respondents report “positive” experiences in six countries: Kenya, Namibia, Nigeria, Senegal, South Africa, and Tanzania (figure 4, panel a, and figure 5, panel a).

Many of the surveyed equity investors and financiers plan to invest in the region in the next three years. When asked about the most attractive markets for investments over the next three years,

they ranked nine countries as “positive” on average: Kenya, Uganda, Rwanda, South Africa, Nigeria, Côte d’Ivoire, Zambia, Senegal, and Mozambique (figure 4, panel b, and figure 5, panel b). Most of these countries have seen substantial power sector reform efforts, often over a decade or more, to provide adequate policy and regulatory frameworks for investment. Others have compensated for insufficient progress on power sector reforms by ringfencing individual investments from the wider power sector policy and regulatory framework (through sovereign guarantees and external credit enhancement from international financial institutions, for example). Guarantees and credit enhancement can mitigate risks during periods of policy and regulatory transition, but they should not be seen as replacements for reforms.

Figure 4. Retrospective investment experience and prospective readiness in Sub-Saharan Africa

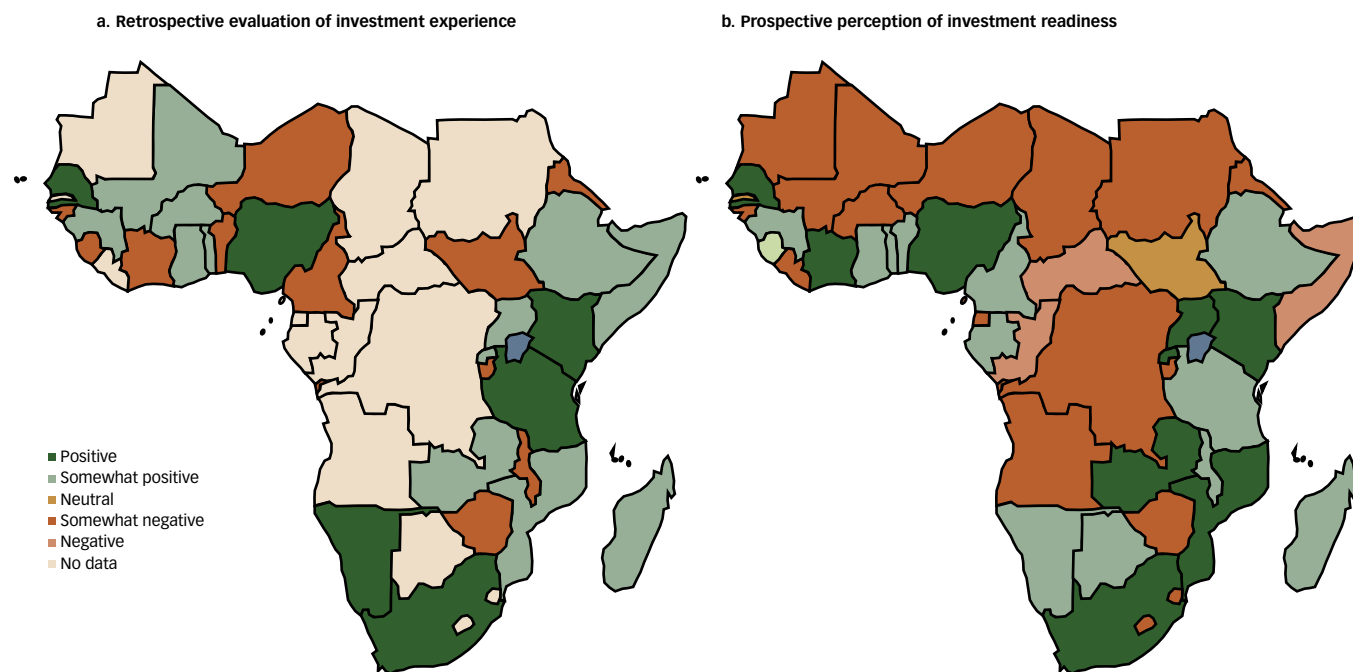
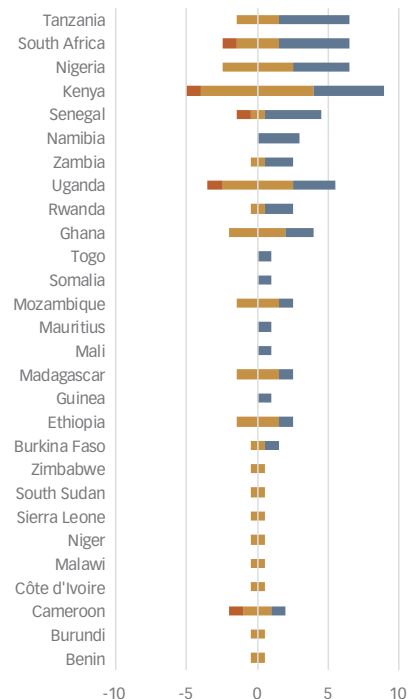


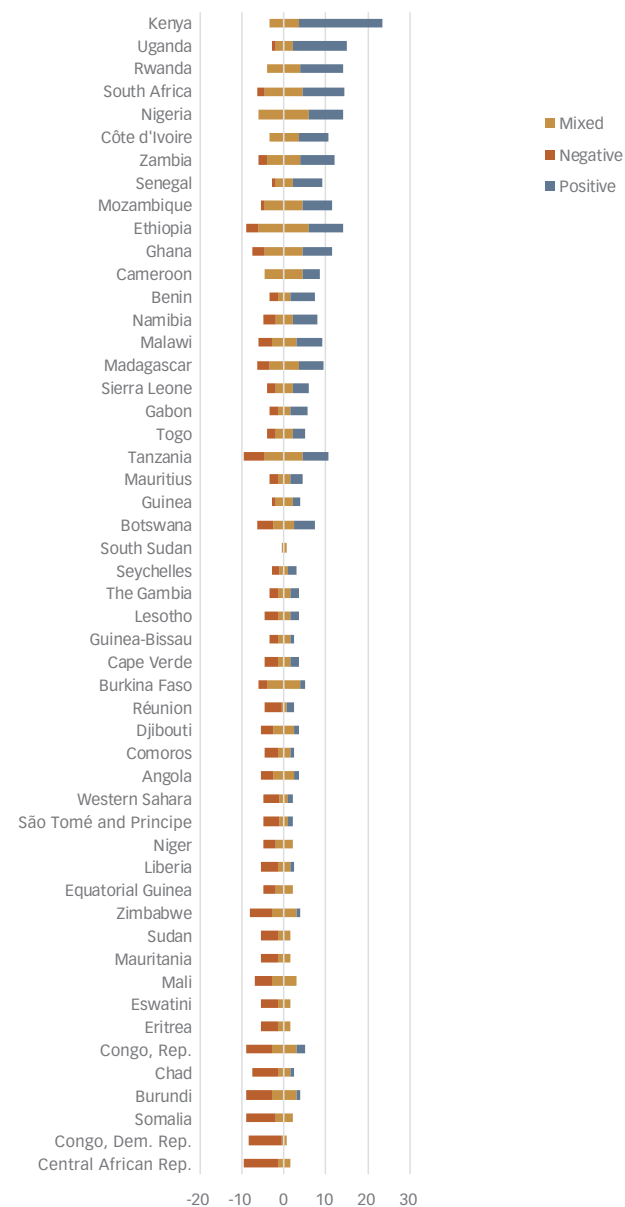
Figure 5. Respondents' retrospective and prospective perceptions of investment experience in Sub-Saharan Africa's power sector, by country

When asked about the most attractive markets for investments over the next three years, investors and financiers ranked nine countries as "positive" on average: Kenya, Uganda, Rwanda, South Africa, Nigeria, Côte d'Ivoire, Zambia, Senegal, and Mozambique.

a. Retrospective evaluation of investment experience



b. Prospective perception of investment readiness



Guarantees and credit enhancement can mitigate risks during periods of policy and regulatory transition, but they should not be seen as replacements for reforms.

How well do the survey results correspond to data-based assessments?

The survey checked how well data-based assessments of countries' readiness for investment reflect investors' and financiers' risk perceptions

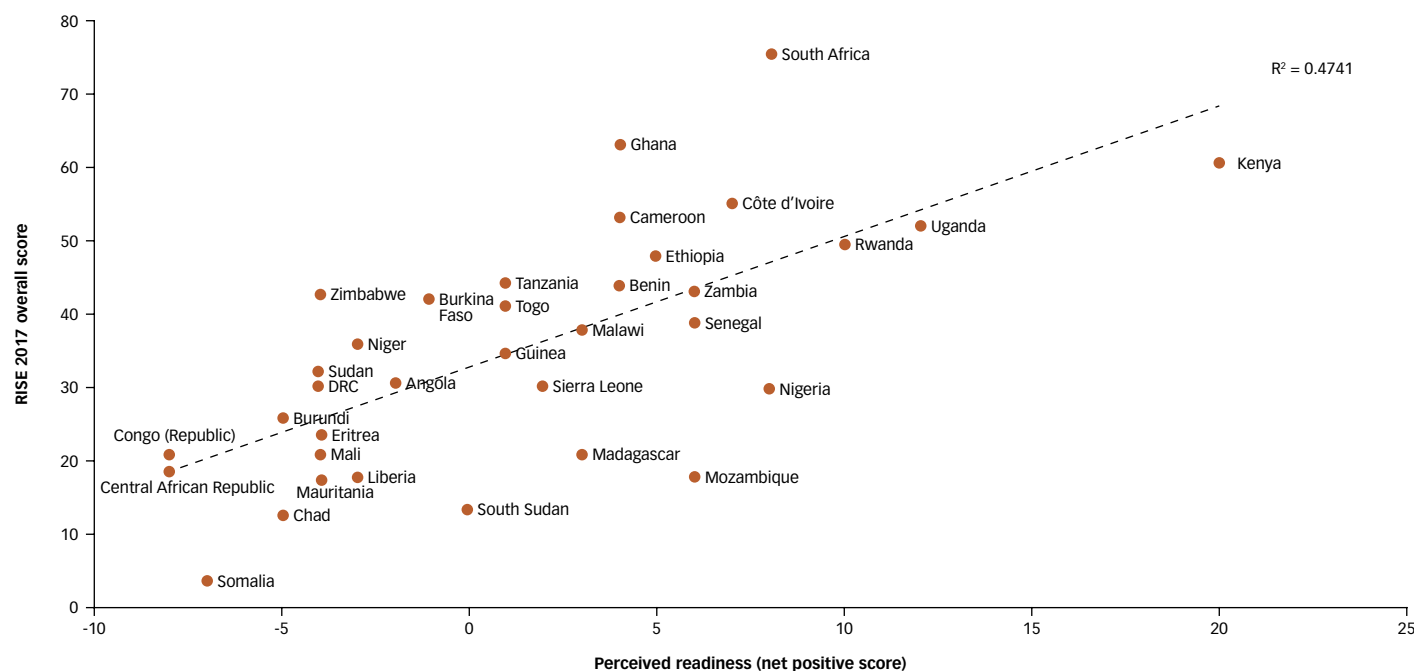
Figure 6 shows that respondents' perceptions of countries' readiness correlate well with their 2017 Regulatory Indicators for Sustainable Energy (RISE) scores (ESMAP 2018). Investors' perceptions are worse than their RISE scores would suggest in Ghana, South Africa, and Zimbabwe and better than their RISE scores would suggest in Madagascar, Mozambique, and Nigeria. But these countries are outliers. Overall, the correlation between RISE scores and private sector perceptions are strong, with an R^2 of 0.47 for a sample of 35 countries.

What drives decisions by investors and financiers in the power sector?

Investors and financiers interested in the power sector in Sub-Saharan Africa assign more importance to policy and regulatory risks than to country context risks and risks related to the wider power sector context, such as the track record of private investment

For this reason, even in difficult country and sector contexts, policy makers can attract private participation by putting in place policy and regulatory frameworks that make projects attractive for private solutions. The survey suggests that the average investor or financier asks three sets of key questions, in the following order:

Figure 6. Correlation between survey respondents' perceptions of readiness for investment in the power sector and RISE scores in Sub-Saharan Africa



Source: ESMAP (2018) and survey results.

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- *Certainty of cash flows*: What are the conditions related to the recovery of costs and investment returns? How can investors enforce payment discipline of the off-taker or customer? What kind of government support is provided to secure investors' cash flows?
- *Conditions of market entry*: What are the risks related to licensing, procurement, and tendering? What is the general legal framework affecting investors' ability to enter the market?
- *Clarity of country's investment priorities*: What are the government's plans for electrification, generation, transmission, and distribution expansion? What are the technical standards, and how are they enforced in the market?

The survey underscores that, despite many challenges, experiences with power sector investments in Sub-Saharan Africa have been more positive than negative. Indeed, many respondents planned to invest in the region in the next three years.

Respondents perceive three segments—power generation, off-grid electrification, and mini-grids—as ready for private solutions in Sub-Saharan Africa. They rank the following countries as the most attractive markets for investments over the next three years: Kenya, Uganda, Rwanda, South Africa, Nigeria, Côte d'Ivoire, Zambia, Senegal, and Mozambique. These results provide insights for governments and development partners aiming to attract more private solutions to their power sectors.

References

- Blimpo, Mousa, and Malcolm Cosgrove-Davies. 2019. *Electricity Access in Sub-Saharan Africa: Uptake, Reliability, and Complementary Factors for Economic Impact*. Washington, DC: World Bank. <http://hdl.handle.net/10986/31333>.
- Cozzi, Laura, Olivia Chen, Hannah Daly, and Aaron Koh. 2018. "Commentary: Population without Access to Electricity Falls below 1 Billion." International Energy Agency, Paris. <https://www.iea.org/newsroom/news/2018/october/population-without-access-to-electricity-falls-below-1-billion.html>.

Eberhard, Anton, Katharine Gratwick, Elvira Morella, and Pedro Antmann. 2016. *Independent Power Projects in Sub-Saharan Africa: Lessons from Five Key Countries*. Directions in Development, Energy and Mining. Washington, DC: World Bank. <http://hdl.handle.net/10986/23970>.

ESMAP (Energy Sector Management Assistance Program). 2018. *Policy Matters: Regulatory Indicators for Sustainable Energy*. Washington, DC: World Bank. <http://hdl.handle.net/10986/30970>.

Gaspar, Victor, David Amaglobeli, Mercedes Garcia-Escribano, Delphine Prady, and Mauricio Soto. 2019. "Fiscal Policy and Development: Human, Social, and Physical Investment for the SDGs." Staff Discussion Note 19/03, International Monetary Fund, Washington, DC. <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2019/01/18/Fiscal-Policy-and-Development-Human-Social-and-Physical-Investments-for-the-SDGs-46444>.

Waissbein, Oliver, Yannick Glemarec, Hande Bayraktar, and Tobias Schmidt. 2013. "Derisking Renewable Energy Investment. A Framework to Support Policymakers in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries." U.S. Department of Energy, Office of Scientific and Technical Information, Washington, DC. <https://www.osti.gov/biblio/22090458>.

The authors thank Sudeshna Banerjee, Marcus Williams, Dana Rysankova, Jon Exel, Rahul Kitchlu, and Jan Kappen for their help in designing and implementing the survey and Arnaud Braud and Vivien Foster for providing peer review comments on the draft of this Live Wire.

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