

Trends, challenges and future outlook

Capital projects and infrastructure in East Africa, Southern Africa and West Africa





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About this survey and report

PwC's Capital Projects and Infrastructure (CP&I) project team developed a standard questionnaire that was used to conduct interviews with key players in the infrastructure sector, including donor funders, financiers, government organisations and private companies across East, West and Southern Africa.

Respondents were spread fairly evenly across the three sub-regions, with 18% operating across more than one. About half of respondents were owners playing multiple roles, including financier and operator, while the remainder represented state-owned enterprises.

Sectors surveyed included water, transport and logistics, energy (power and oil & gas), mining, social infrastructure, telecoms and real estate, with the main focus being on primary infrastructure. More than one-third (39%) of respondents were involved in more than one sector.

Respondents reported extensive experience in infrastructure development with about one-third having been involved in more than 20 projects in the last year. Southern Africa had the most respondents involved in more than 20 projects, while East Africa had the largest number involved in 6-20 projects.

In most cases, interviews were conducted in person, which allowed meaningful conversations to take place. Responses to quantitative survey questions were then captured with a survey tool. The CP&I team used this information, together with our extensive knowledge of the infrastructure value chain and other research, to produce this report.



Foreword

This survey has provided unique insights into the world of infrastructure delivery across countries, regions and development corridors in sub-Saharan Africa. We thank the many respondents who participated in the survey and gave of their valuable time to engage with our teams and share their insights and knowledge.

The participants were spread fairly evenly across the eastern, western and southern regions of sub-Saharan Africa, with 18% operating across multiple regions. About half of the respondents were owners playing multiple roles, including those of financier and operator, while the rest represented state-owned enterprises.

Our survey results indicate an opportunity-filled future for infrastructure development in sub-Saharan Africa. Infrastructure spend in the region is estimated to reach US\$180 billion per annum by 2025. Sectors with the highest budget allocations are transport (36%) and energy (30%). At this rate, the region will maintain its 2% share of the global infrastructure market.

While respondents are clearly committed to the continent and optimistic, there are a number of obstacles they must deal with, which will not only affect their current projects but, perhaps more importantly, may deter other project owners and investors from entering the African market.

To attract all-important external funding, it will take a concerted effort by governments, private businesses and NGOs to overcome such nagging problems as political risk, regulatory and legal uncertainties, and the shortage of critical skills. Our research findings highlight the crucial gap in financing for mega infrastructure developments and the need to find innovative ways to 'unlock' the funding process.



The good news is that foreign companies have already demonstrated their appetite to invest in Africa. In PwC's *17th Global CEO Survey* released in January 2014, many CEOs confirmed their focus on Africa as a growth market, with many expecting high growth rates and above-average profitability on the continent.

An important finding of the survey is the need for better planning, procurement, project management and controls. This will help reduce the number of delays and the size of cost overruns, providing an example to other project owners and investors that African infrastructure can truly be developed efficiently and profitably.

We look forward to working with all key stakeholders in unlocking Africa's broad-based growth and prosperity through affordable and reliable infrastructure development.

Jonathan Cawood

Director

Capital Projects & Infrastructure Leader – PwC Africa



Executive summary

The shallow economic recovery in most developed markets has shifted the focus to faster-growing markets. This is also true for the infrastructure development sector. While the largest infrastructure spend will take place in Asia, led by China, the expected growth in infrastructure spend in sub-Saharan Africa is significant at around 10% per annum to 2025. With an abundance of natural resources and recent mineral, oil and gas discoveries, demographic, social and political shifts and a more investor-friendly environment, the investor spotlight shines brightly on Africa.

One of the CEOs of a large state-owned enterprise in Africa summed it up as follows:

Among the emerging markets, we think that Africa, for the first time in many centuries, is going to contribute quite significantly to global economic growth. While it's coming from a low base, the continent's economy is growing at about 5%, making it the fastest-growing region in the world.

Project bankability/viability and access to funding are the most common challenges emerging from our survey. In order to address this issue, African countries must overcome the obstacles of inadequate regulatory frameworks, internal capacity limitations, political instability, policy incoherence, reported corruption, and a debilitating shortage of capacity and skills.

Some of our key findings include:

- More than half of respondents indicated that their planned spending on infrastructure, both new projects and refurbishment of assets, would increase by more than 25% from the previous year. They said much of their spending would be focused on new development, with 51% of all respondents planning to spend more than half of their budgets on new assets.
- Respondents from West Africa were especially bullish, with 58% planning an increase of more than 25% in spending, followed by those in East Africa (53%) and Southern Africa (40%).
- All regions are expected to be major beneficiaries of infrastructural development, with 44% of respondents indicating they would be targeting their capital project and infrastructure spending in East Africa over the next 12 months. Next is Western Africa (25%), followed by Southern Africa (22%).
- Respondents indicated that they would be increasing their focus on power, oil & gas and transportation & logistics while remaining constant in the water sector.
- Almost 90% of respondents said their capital projects had delivered the expected benefits to stakeholders all or most of the time over the past 12 months.
- Access to funding emerged as the top challenge in delivering large, complex infrastructure projects. It was named as a key challenge by almost half of respondents, followed by the policy and regulatory environment and political risk/impact of political interference, which were cited by about a third of respondents.
- Funding availability was a concern across all regions, but respondents in Southern Africa were more concerned about a lack of skills, internal capacity to handle major capital projects and political risk.
- Nearly all respondents said they consider external private sector financing vitally important for capital projects in Africa.
- Lack of skills and external contractors across the infrastructure value chain in Africa were cited by respondents as challenging factors and among the primary reasons for quality problems, while funding issues were cited as a main reason for delays in project delivery.
- Project delays and cost overruns were significant problems in the past year, with nearly half of respondents reporting delays of more than six months and more than a third saying projects went 10–50% over budget.
- Most respondents said their projects had experienced few, if any, quality problems or variations from original specifications, but about a third did encounter such problems in some or most cases.

- Respondents said progress reporting was done on a consistent basis to all stakeholders and more than three-quarters had a defined infrastructure master plan. However, only 21% completed independent reviews of their projects for quality, risks and financial performance at key decision points.

A group of 20 African national governments reported spending US\$42.2 billion on infrastructure in 2012. Infrastructure spend for sub-Saharan countries is expected to reach US\$180 billion per annum by 2025. Sectors with the highest budget allocations were transport (36%) and energy (30%). At this rate, the region will maintain its 2% share of the global infrastructure market.

Infrastructure development's impact on economic growth is significant. The World Economic Forum estimates that every dollar spent on a capital project (in utilities, energy, transport, waste management, flood defence or telecommunications) generates an economic return of between 5% and 25% per annum.

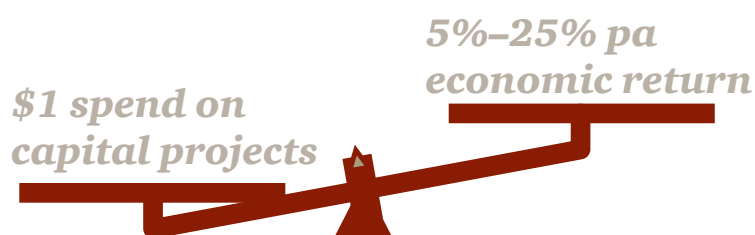
Our survey findings highlight these opportunities across countries and sectors and confirmed a sense of optimism and excitement about the future prospects for infrastructure delivery and economic growth. We also pinpointed a number of critical challenges that must be addressed before Africa's potential can be fully realised.

"Africa is the next frontier for most company executives and investors who have ambitious plans for the continent. Indeed, 90% of African CEOs interviewed for this issue of 'The Africa Business Agenda' told us that they were confident of mid-term prospects for their businesses, with just more than half (51%) saying they are 'very confident'."

– **Edouard Messou**
Territory Senior Partner, PwC's Francophone Africa Market Region
The Africa Business Agenda, PwC, 2014

"Infrastructure is at the core of inclusive growth, a growth for all, a growth that creates jobs, reduces inequalities and offers opportunities to African citizens. African countries cannot expand education opportunities for youth and provide jobs without access to electricity, broadband and connectivity. Food security and agricultural value chain development cannot be achieved without access to reliable transport infrastructure that will help in reducing post-harvest losses. Africa's growing cities would be uninhabitable without clean water, adequate sanitation, reliable and affordable electricity supply and mass transit systems."

– **Gilbert Mbeshherubusa**
African Development Bank
'Innovative thinking to meet Africa's infrastructure needs'
The CBC Africa Infrastructure Investment Report 2013





Africa's infrastructure outlook

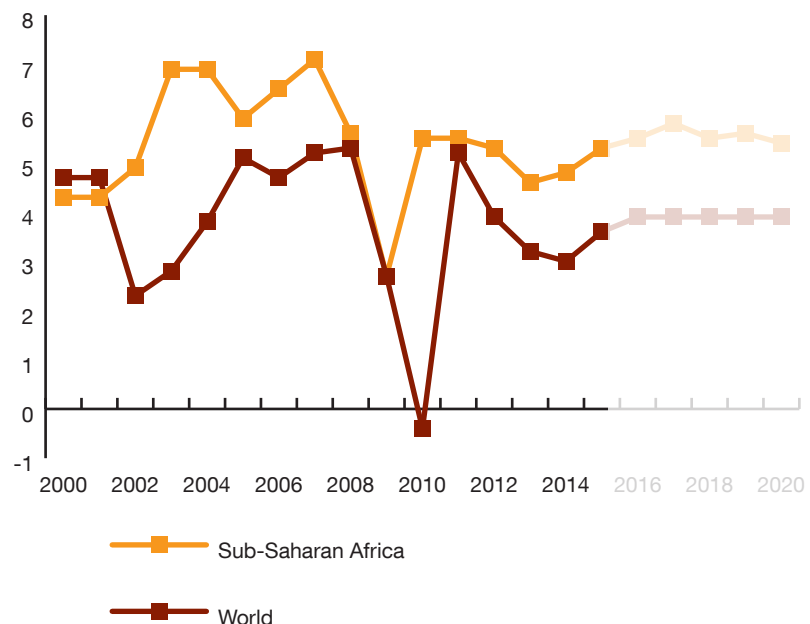
Dealing with Africa's infrastructure backlogs and its future demands is high on the agendas of leaders and civil society on the continent and abroad. There is widespread recognition of the vast business opportunities in Africa as a growing consumer market and future skills and innovation pool as well as its abundance of natural resources.

Taken as a whole, Africa's infrastructure lags well behind that of the rest of the world with some 30% in a dilapidated condition and massive backlogs in almost every country across most infrastructure types. Improving infrastructure will be critical to spurring Africa's continued economic expansion and enhancing its standard of living and stability.

Speaking of Africa as a homogeneous collective does not provide an accurate picture, though – there are vast country and regional differences. For example, South Africa's overall transport infrastructure scores as well as India's and better than Indonesia's. In fact, when it comes to roads, ports and air transport infrastructure, South Africa scores higher than China, although China has a clear edge in rail. Egypt and Kenya score lower, but are ranked higher than Vietnam, another of Southeast Asia's fastest growing economies.

In tandem with the robust real GDP growth experienced across most sub-Saharan countries, national governments are increasing their investments in infrastructure. According to PwC's recent *Infrastructure Spend Review*, portfolios will increase at an annual average of 10% through to 2025, exceeding US\$180 billion per annum by the end of this period.

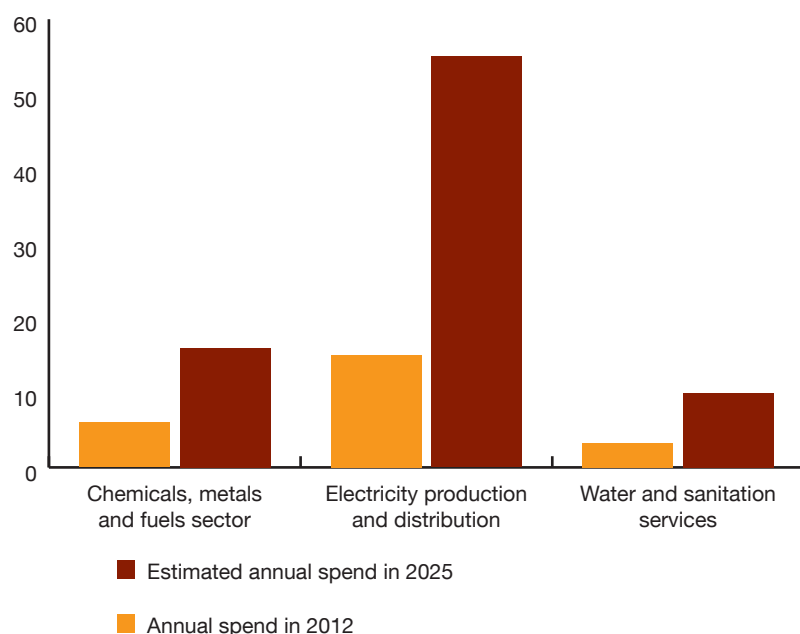
Figure 1: Real GDP growth (%)



Source: IMF, World Economic Outlook database

Infrastructure spend for sub-Saharan African countries is expected to reach US\$180 billion per annum by 2025

Figure 2: Planned increases in annual infrastructure spend across Africa's seven main economies* (US\$ billions)



* Ethiopia, Ghana, Kenya, Mozambique, Nigeria, South Africa and Tanzania
Source: PwC Capital projects and infrastructure spending: Outlook to 2025

Infrastructure investment is a vital catalyst for growth. Improving Kenya's infrastructure up to the level of middle-income countries, for example, would boost annual growth by more than three percentage points. For Nigeria, this would mean an increase in annual real GDP growth by around four percentage points.

Mozambique is a prime example of a country where inadequate infrastructure is hampering growth, notwithstanding its rich endowment of natural resources. The country's infrastructure development is not progressing at the pace required to unlock this potential. Improvements to the Sena rail line, for instance, have been delayed, and funding is insufficient. Meanwhile, flooding on the rail line interrupted coal shipments for two weeks in February 2013, hitting coal producers hard. In July 2013, the line was closed again after a train derailed.

Questions remain about who will pay for and run the new rail and port infrastructure needed. Private companies are already making major investments, but are hampered by a lack of coordination among state entities and inadequate regulatory clarity. Despite this, strong economic growth is forecast for Mozambique for 2014–2023 (averaging 7% per annum), but this can only be achieved if these obstacles are dealt with.





“I think the optimism reflects a few things. First, Africa represents 15% of the world’s population and 3% of the world’s GDP. Secondly, Africa has a track record since the year 2000 of growing at 5.5%. It’s a tremendous opportunity. That’s why we see sovereign wealth funds, multinational corporations, African companies indigenous to the home markets, Brazil, India and China, all very active. We’re seeing the growth of two things. First, the exploitation of natural resources on the continent and two, the exploitation of the demographic dividend in Africa, the rising consumer and the need to address that.”

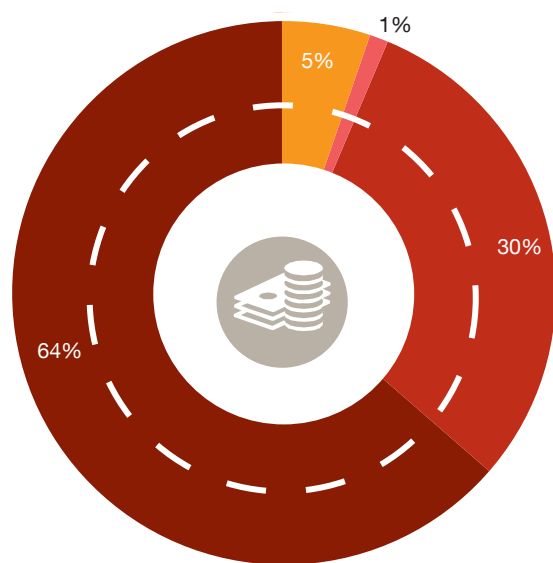
*– Colin Coleman
Managing Director, Goldman Sachs SSA
The Africa Business Agenda, PwC, 2014*

Harnessing the private sector

Survey respondents ranked funding availability as one of their top three challenges and agreed that private sector spending would be crucial, given the limitations on government financing. Nearly two-thirds of respondents said external private sector financing for capital projects is critical, while 30% indicated it was of growing importance.

Figure 3: The importance of private sector financing

Q: How important is external private sector financing for capital projects in Africa?



- Not needed (projects funded internally)
- Not critical
- Growing importance
- Critical
- Undecided

Survey respondents ranked **funding availability** as one of their top three challenges and highlighted that private sector financing is critical

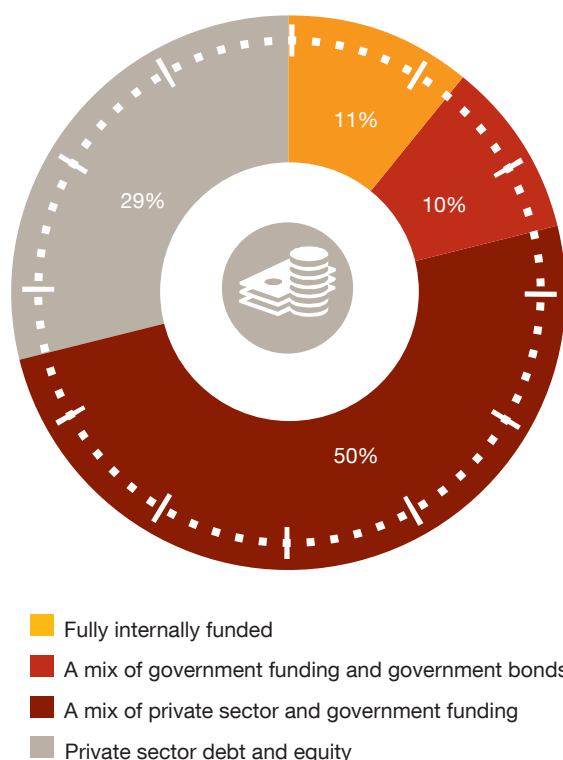
“Africa, though increasingly taking on higher financing capacity on its own, still requires substantial external financial support to execute critical infrastructural projects.”

– Survey respondent
Energy and mining sector
West Africa

Base: 95 respondents
Source: PwC analysis

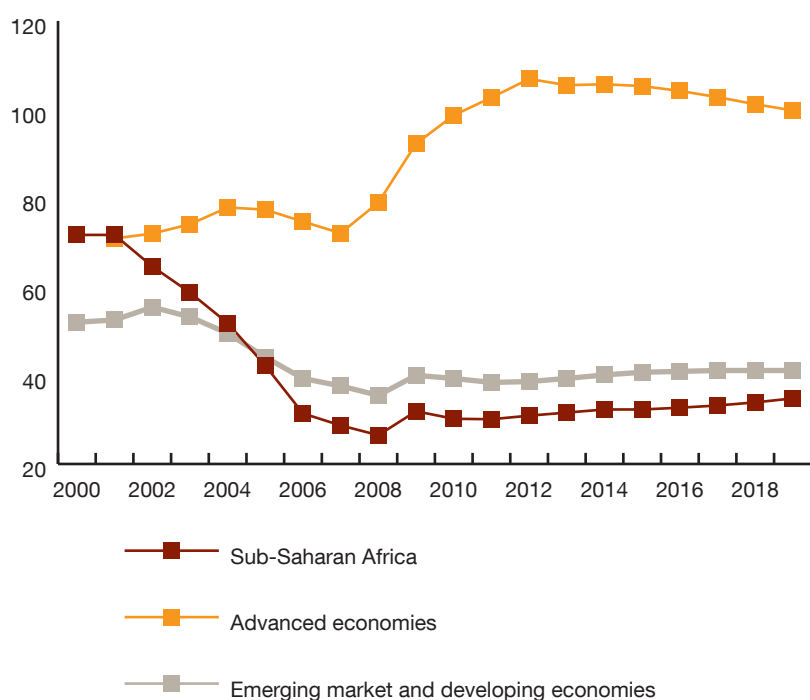
Figure 4: Methods of funding in the short term

Q: How do you expect your infrastructure projects to be funded over the next year?



Base: 95 respondents
Source: PwC analysis

Figure 5: General government gross debt (% of GDP)



Debt burdens are lower as a proportion of GDP in most African economies than in developed and even middle-income countries. Hence governments would be expected to have greater room to borrow to fund infrastructure investment. However, with a lower tax-take relative to GDP (generally 15–20% across Africa, compared to 25% in Argentina, 35% in Brazil, and even higher in Europe), as well as poorer credit ratings and track records than mature countries, financial market perceptions of sustainable debt loads in African economies tend to be much lower. When combined with sizable fiscal deficits, this undermines government resources for investment in many countries.

Source: IMF, World Economic Outlook database

Alternative funding from sovereign source funds and pension funds is becoming increasingly important in Africa, but investors are typically more interested in projects that are fully operational and shy away from greenfield projects and their construction risks.

Many projects across sub-Saharan Africa have been impacted by the lack of funding or insufficient funding.

Private sector investment is especially critical in some African nations. For example, one of the world's poorest nations, Mozambique, is attracting substantial investment interest from foreign players such as Italy's ENI, USA's Anadarko, Brazil's Vale, Thailand's Italian-Thai and India's Jindal Steel, as a result of numerous big-ticket projects in the pipeline. This investment is crucial for Mozambique's economic development since the government is unable to fund the necessary investment to support economic expansion.

China is a major funding source for infrastructure in many African countries. Based on 'infrastructure for oil' trade agreement, China has made significant strides in changing the Angolan infrastructure landscape through the construction of large railway, road, and housing projects in areas like Kilamba Kiayi in Luanda.

In return, Angola became China's main supplier of oil, overtaking Saudi Arabia in 2010. China will continue to be a key investor in Angola as one of its biggest trading partners. Thanks to its large oil reserves, Angola has the financial resources necessary to begin addressing structural issues and to rebuild the country's shattered infrastructure, expand the economy, and modernise and better connect its cities. Similar deals are evident in other Africa countries.

91%
of respondents
experienced
delays of more
than a month
on projects

"Internal capacity is limited, and with competing priorities, government cannot support most of the projects."

*– Survey respondent
Public sector
East Africa*



“Chinese foreign direct investment (FDI) has infiltrated everything from shoe manufacturing to food processing across Africa. Chinese firms have also made major investments in African infrastructure, targeting key sectors such as telecommunications, transport, construction, power plants, waste disposal and port refurbishment. Given the scale of Africa’s infrastructure deficit, these investments represent a vital contribution to the continent’s development.

Another common misconception is that Chinese companies now rule the African economy. In fact, about 90% of the stock of FDI in Africa still originates from firms in advanced countries, most of them in the US and the European Union.”

– Harry Broadman

*‘Separating fact from fiction in the China-Africa relationship’
Gridlines, PwC, 2013*

International financial institutions, including the World Bank Group’s International Finance Corporation (IFC), are helping to mobilise private investment in Africa. After the prolonged political crisis in the Côte d’Ivoire, the IFC, as lead arranger, succeeded in mobilising about US\$1 billion of private investment in the country’s power sector, financing the expansion of the Azito and CIPREL power plants.

What helped attract investors was the IFC’s decade-long focus on the Ivorian power sector’s financial stability. In 1998, the IFC played a key role in designing a unique ‘cash waterfall’ structure to manage the sector’s cash flows and make the prospect of payment apparent to private independent power producers and gas suppliers.

Defining a clear source of revenue through user payments or other sources for some projects, particularly those of a social nature such as hospitals and schools, is often difficult and a prerequisite for project financing.

Weak infrastructure planning at the macro country level, characterised by limited capacity to identify technically feasible and economically viable programmes and projects, remains among the greatest challenges to securing private funding. Many countries lack capacity and skills to prepare project feasibilities and take projects through to procurement. Lack of transparency and sound governance practices, coupled with protracted procurement processes, reduce investor appetite.

Few African countries have a viable structured PPP programme that supports both a structured process and a well-regulated system. This is necessary to provide more certainty and reduce risks for long-term investors.

“The key risk is getting the assets completed on time and on budget. This risk needs to be significantly borne by the government at this stage until the market is sufficiently developed and predictable. Managing completed projects is a much more acceptable risk at the moment.”

– Survey respondent
*Energy and power sector
West Africa*



Changing funding models

Funding models are gradually changing in Africa and respondents expect new approaches such as public-private partnerships (PPPs) to become more prevalent.

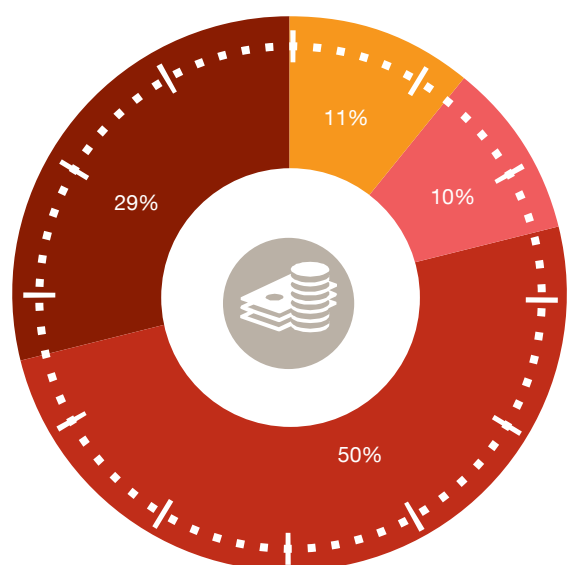
At least half of respondents said they expect infrastructure capital projects to be funded by a mix of private and public sector funding, while 29% said they expect to rely on private sector debt and equity.

More respondents in Southern Africa than other regions expect projects to be fully funded internally or through a mix of government funding and government bonds. Respondents in East and West Africa are counting more on a mix of private sector and government funding or private sector debt and equity.

*Respondents from East Africa and Southern Africa indicated that **traditional procurement models would be used more frequently in funding future projects.** Those from West Africa said PPPs would be the preferred funding model*

Figure 6: Sources of funding

Q: How do you expect your infrastructure projects to be funded over the next year?



- Fully internally funded
- A mix of government funding and government bonds
- A mix of private sector and government funding
- Private sector debt and equity

Base: 95 respondents
Source: PwC analysis

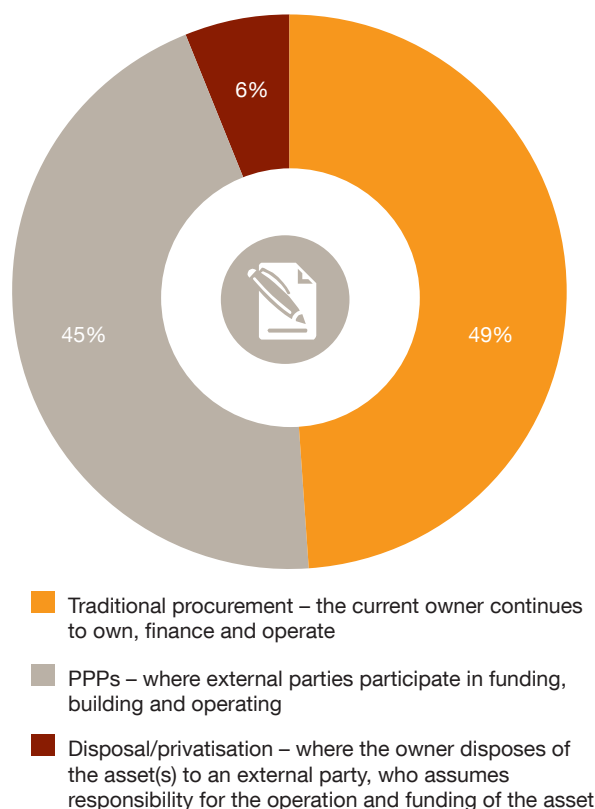
Nearly half of the respondents (49%) indicated that the traditional procurement model, where the owner finances and operates a project, will be used more frequently, while almost as many (45%) indicated that PPPs, where the external parties participate in the funding, building and operating of the asset, will increase in number.

Respondents from East and Southern Africa said traditional procurement models would be used more frequently, whereas respondents in West Africa said PPPs would become the preferred model. Through the use of the PPP model, the private sector provides funding and assumes many of the project risks.



Figure 7: Procurement models

Q: Which of the following procurement models do you believe will be used more frequently in delivering your capital projects?



PPPs allow cash-strapped governments to put greater financing risk and burden onto the private sector

Base 95 respondents
Source: PwC analysis

Support for different financing models also varied by sector. Traditional procurement models were favoured mainly by respondents from national governments, water and mining organisations.

Power and oil & gas respondents were split on the issue of the traditional procurement method versus PPPs. Meanwhile, local government, real estate, telecoms, and transport respondents were more in favour of PPPs.

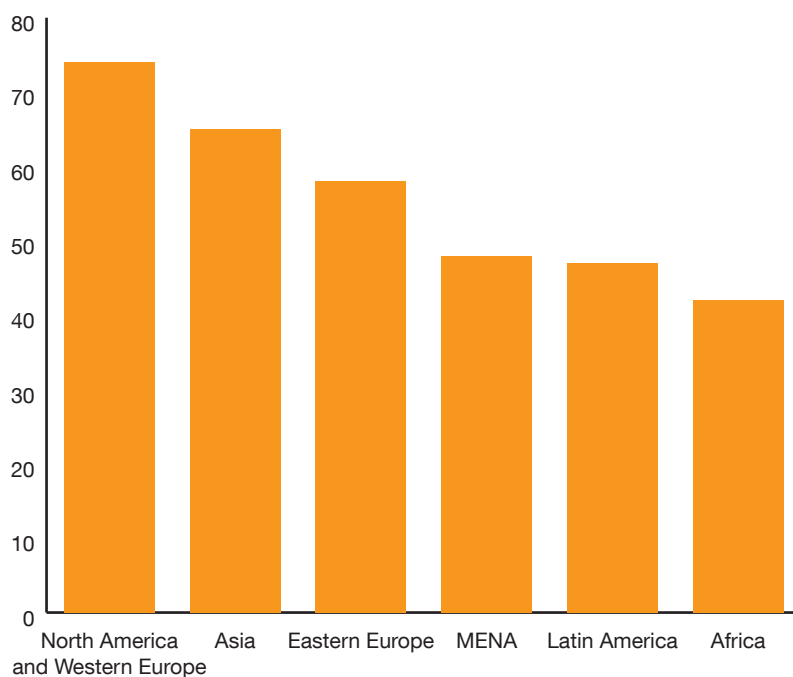
The key criteria for successful partnership models include strong political support, a committed sponsor, a sound regulatory framework, a viable off-taker or source of service fees, support from users of the service and sensible, logical allocation of risk and market interest and capacity.

Organisations must be cognisant of the existence (or lack thereof) of these factors in their operating environments when considering PPPs as a funding method.

PPP units have been established in a number of African countries ranging from South Africa to Nigeria, Senegal and Kenya. These units are at different levels of maturity, but are moving towards standardisation and adoption of leading practices.

The Nigerian Government has also been advocating the increasing use of public-private partnerships for several transport projects. Governance and management will need to be well-managed though, as many of Nigeria's projects have been left unfinished including roads, factories and oil & gas plants.

Figure 8: Average project finance rating by region



*Sub-Saharan countries are looking at **alternative ways to fund** their projects*

The BMI Project Finance Ratings assess the risk in raising and repaying financing over the life cycle of a project. The higher the rating, the more conducive the environment to successful PPP procurement.

Source: BMI, Nigeria Infrastructure Report, Q1, 2014


According to BMI's Infrastructure Project Finance Ratings, which assess the risks in raising and repaying funding over the life cycle of a project, Western Europe and North America remain the most conducive destinations for PPPs. This is due to greater access to financing, the well-established regulatory environment and the limited political and structural risks in these markets.

In contrast, while many sub-Saharan countries provide vast opportunities for funders, they also carry a high level of risk.

For this reason, these countries are looking at alternate ways to fund their projects. The issuing of bonds has been undertaken by some countries. For example, Rwanda launched a US\$400 million Eurobond in April 2013, Kenya issued a Eurobond for US\$2 billion in 2014 and Ghana issued a US\$1 billion Eurobond in July 2013, with the funds to be directed towards infrastructure projects, as well as meeting financial obligations.

"We are investing in Nigeria in the infrastructure sector. We've chosen sectors where the opportunities can be seen [such as] telecommunications, healthcare, motorways and real estate. I'm very optimistic, more so than I was 18 months ago. The second thing that I'm seeing is that the financial market is getting more and more sophisticated in certain areas that we never saw ten years ago. Private equity is growing, venture capital is rising. These are things that I believe will be significant in terms of their contribution. I think there is a lot more."

– Uche Orji
CEO, Nigeria Sovereign Investment Authority
The Africa Business Agenda, PwC, 2014



In South Africa, some of the larger state-owned companies have made progress in issuing bonds to raise capital. For example, Transnet announced in August 2013 it had raised ZAR1.5 billion, using a five-year bond through its Domestic Medium Term Note Programme.

Loan guarantees provided by multilateral agreements are another initiative being undertaken to assist the region to access finance for mega infrastructure projects. The intent of these guarantees is to encourage financiers to invest in infrastructure on the continent by reducing certain risk components inherent in the investment decisions. Most recently the African Development Bank set up the Africa50 project finance platform to provide bridging finance, direct loans and loan guarantees as a means to support projects to move beyond the procurement of finance stage, where many become stuck.

To further support infrastructure development in sub-Saharan Africa, the African Development Bank and EU launched the Infrastructure Investment Programme for South Africa (IIPSA) in 2014. The intention of this ZAR1.5 billion fund is to provide alternative and innovative financing to organisations that are undertaking infrastructure development projects in South Africa or projects that cross two or more borders of SADC member countries.

Speaking of the IIPSA... “We therefore view this programme as a strategic intervention to fund South Africa’s national and regional infrastructure projects, especially at the critical initial stages to prepare projects to bankability... It also aims to attract private financing into projects with a high socio-economic return by enhancing the financial feasibility and project quality and/or by reducing the risk associated with such.”

*– Roeland van de Geer
EU Ambassador to South Africa
Fundingconnection.co.za*



Political risk and corruption

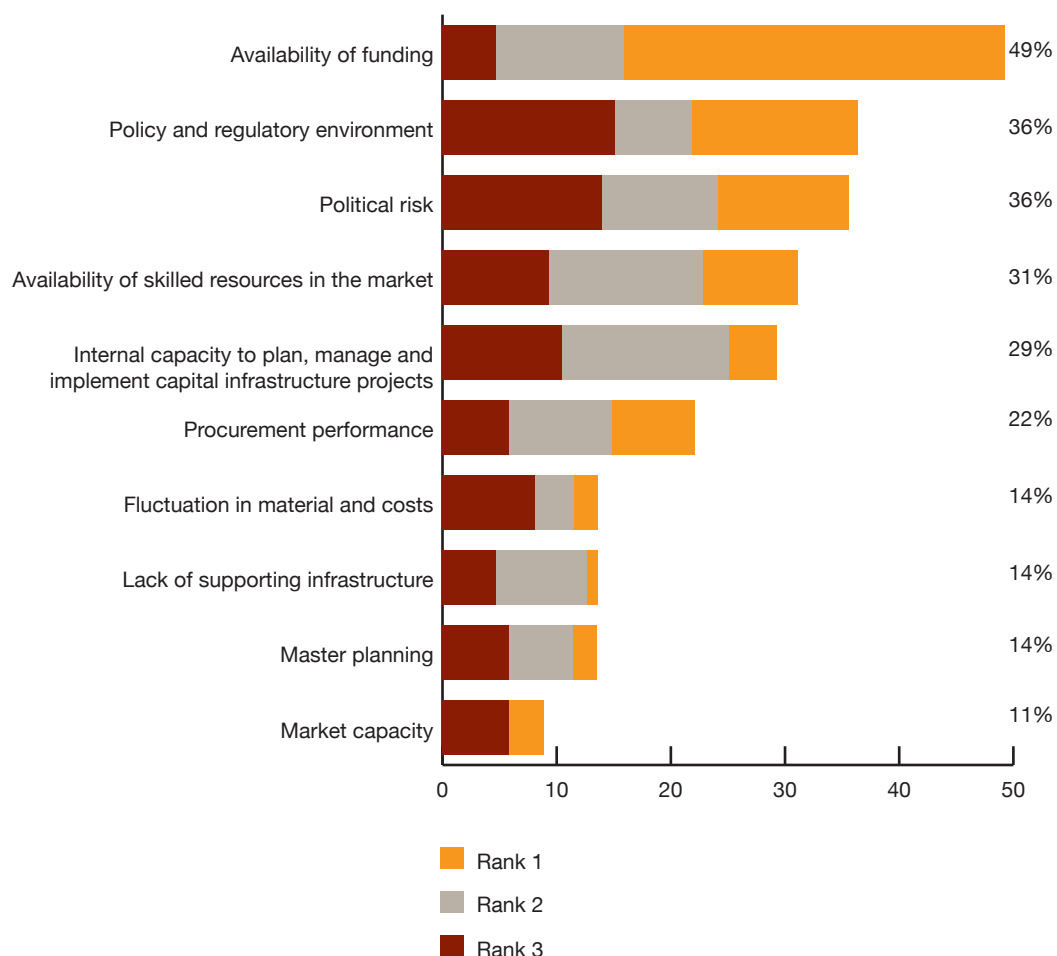
Political interference, policy uncertainty and delays in passing laws are stifling growth, development and investment in a number of African countries. Just

over a third of respondents consider the current policy and regulatory environment and political risk as major challenges. They blame bureaucratic

delays in decision-making and policy changes for slowing down some of their projects in the past 12 months.

Figure 9: Top challenges facing capital projects

Q: What are your top three current challenges in relation to capital projects that you are involved in?



Base: 95 respondents
Source: PwC analysis

Project sponsors, developers, and operators, along with investors, often lack clarity around contracting, government regulation, contracting arbitration, policy and process for procurement, planning and tariff setting. In a number of cases this has resulted in government officials terminating construction and concession contracts. In others, significant claims have been brought by the private sector against governments.

The greater the levels of political risk, political interference and corruption, the more cautious investors become. Most capital projects are long term, requiring many years of investment and development before returns are realised and debts repaid. Often they extend far beyond the political term of office in democratic countries. To assist with project funding and managing the issue of political risk, the World Bank's Multilateral Investment Guarantee Agency is one of a number of organisations providing political risk guarantees to debt financiers to increase the investment/credit grade of a project and hence move them to bankability.

Infrastructure regulation in Africa is still in its early days. Typically, new laws and regulatory bodies exist for telecommunications and electricity, whereas few countries have created water or transport regulators. Most African countries have undertaken initial

institutional reforms, the broader sector policy and legal measures, many of which can be accomplished by the stroke of a pen.

What have lagged are regulatory and governance reforms. For instance, effective regulation requires building organisations that challenge established, vested interests. But interference from government continues to undermine regulatory independence in many countries.

In addition to political and governmental issues within individual countries, project developers and investors see a growing need for countries to work collaboratively on the development of infrastructure projects that frequently extend beyond one country's borders.

A key factor in Africa's future development will be increasing cross-border trade, both within Africa and with the rest of the world. This means solid road and rail networks that span regions need to be established. One example is the development of the LAPSET (Lamu Port-South Sudan-Ethiopia Transport) corridor, which will provide export routes for South Sudan and Ethiopia, linking them and Kenya. Another example is the 1 500km Trans-Kalahari rail which is planned to link Botswana with Namibia to support coal exports from Botswana's Mmamabula coal mine via Walvis Bay.

Cross-border integration is crucial not only to facilitate trade, but also to link resources from source to point of consumption – e.g. bulk water and power generation sources and feedstock. In sub-Saharan Africa, 17 major river basins span as many as 35 countries. Regional cooperation and integrated resource management are therefore essential to ensure that water resources are managed optimally and efficiently, with consideration of long-term sustainability.

Power is vital for infrastructure development and the establishment of multi-country 'power pools' aims to provide more stability in power supply and greater regional energy independence.

There has already been much collaboration in the planning of infrastructure projects and some implementation has started. The Eastern Electricity Highway Project – a 1 000km cross-border power line connecting Ethiopia's and Kenya's electricity grids – is due to come online in 2018. However, the pace of integration and collaboration will need to increase substantially if sub-Saharan Africa is to meet its goals of economic growth, poverty reduction and social upliftment.

“But at every step, harmonisation is voluntary. In the absence of formal legal authority to see that continental and regional policies are written into effective national laws and regulations and to compel national authorities and utilities to follow through on their commitments, the regional institutions must rely on cooperation, consensus and good will, which too often are in short supply..... Missing, as a result, are consistent national policies, regulations, and norms among countries that share regional infrastructure. The result is a profound lack of harmonisation of laws, standards, and regulations that complicate the processes of planning and financing vital regional projects while impeding cross-border economic activity.”

– Study on Programme for Infrastructure Development in Africa (PIDA)
‘Africa Infrastructure Outlook 2040’, 2011

Bribery and corruption are also deterrents to infrastructure investment in Africa. According to PwC's 17th Annual Global CEO Survey, CEOs in Africa, as well as in Latin America and the Middle East, are more apprehensive about bribery and corruption than those in the rest of the world.

Despite the development of new policies and regulations in many jurisdictions, corruption and security concerns continue to be significant challenges in some countries. Nigeria, for instance, suffers from high levels of corruption. Companies operating in the country also face the threat of an unstable security situation, especially in the Niger Delta area and the north, where militant group Boko Haram is known to target international workers. Worker safety is not always the only security concern, as certain areas are also experiencing threats to physical infrastructure, such as the pipeline vandalism experienced in the Niger Delta.

Energy policy reviews and revision to legislation in many countries, in particular Uganda, Tanzania, and Nigeria, are intended to provide a more transparent process to reassure international investors that corruption is being addressed. If infrastructure projects are to succeed, it is clear that corruption needs to be dealt with in a tough manner, with a zero-tolerance policy and the prosecution of individuals to address this scourge and rid the continent of its bad reputation.

If infrastructure projects are to succeed, it is clear that corruption needs to be dealt with in a tough manner, with a zero-tolerance policy





Project delays

While all projects are susceptible to going off track and experiencing costly delays, some are more vulnerable, such as those involving new technologies, those dependent on regulatory and environmental approvals, those reliant on substantial funding and those in politically unstable regions or requiring complex stakeholder management.

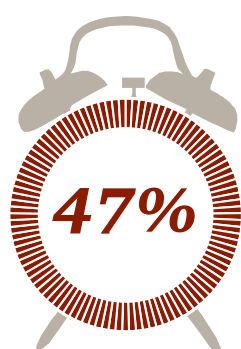
Large projects are inherently risky, encompassing many interconnected parts, resources, contractors and some with values in the US\$ billions spanning more than one or two decades. In immature markets, project developers face additional distinctive problems, including language and cultural barriers in contract negotiations, different legal standards, a greater likelihood of political interference, difficulty

accessing supporting infrastructure (power, water, housing, airports, healthcare, etc.) and the need to import skilled labour, equipment, and materials. This challenge manifests in many parts of Africa.

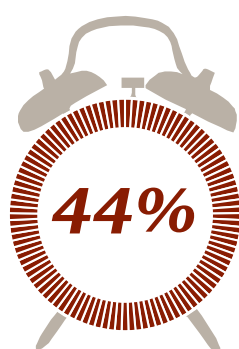
The impact of delays can extend beyond the project itself. A 2013 PwC analysis of 52 capital project missteps at public companies revealed that after a public announcement of a capital project delay or shutdown, the majority of companies experienced a steady decline in share price. By the three-month mark following the announcement, the decline in share price averaged 15%. In the most severe case of the companies analysed, one experienced an almost 90% decline in share price.

Nearly half (47%) of our survey respondents said they experienced delays of more than six months on capital projects. Those in East Africa suffered the most delays of greater than six months, while those in Southern Africa said the largest number of delays were between one and six months. Some well-publicised mega projects in the region have suffered delays of between 40% and 150% of the planned schedule.

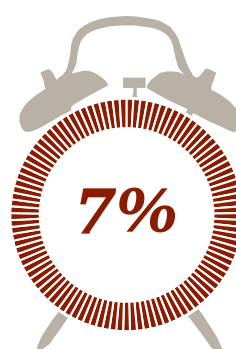
Average duration of delays experienced by respondents in the last 12 months



**More than
6 months**



1–6 months



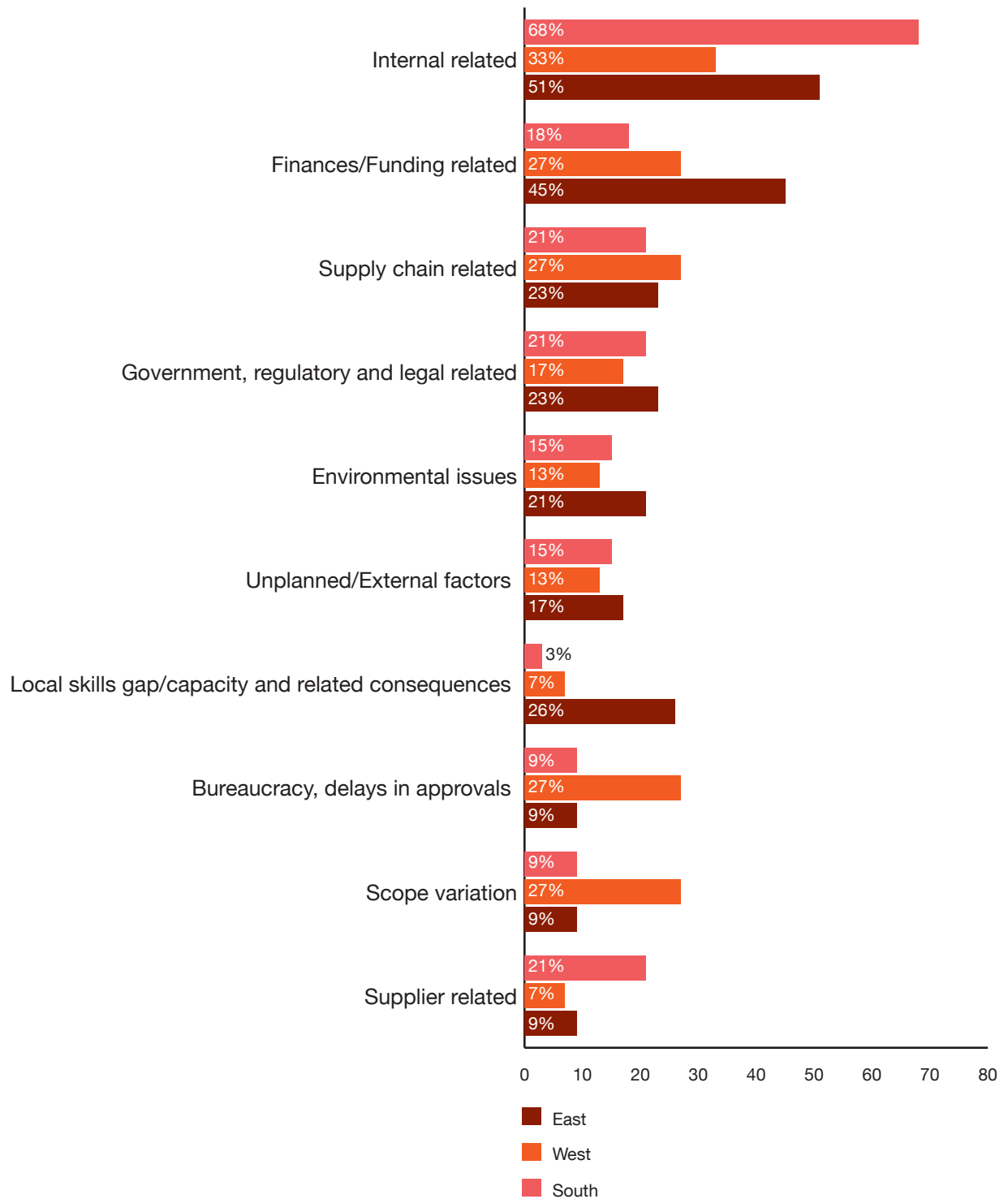
**Less than
1 month**



**No visibility
of project
schedule**

Figure 10: Primary reasons for delays

Q: What do you consider your top three reasons for the delays to project completion?
(Summary of top three reasons)



Base: 95 respondents
Source: PwC analysis

The most common reasons given for delays were:

- **Internal problems**
Including inadequate pre-engineering, weak project management, internal procurement issues involving staff and processes, weak governance, poor planning, lack of visibility, deficient resource planning, unrealistic expectations on timing and scope change;
- **Finance/Funding issues**
Including capital rationing, delays in the release funds, and failure to provide promised and approved funds;
- **Governmental complications**
Including regulatory and legal requirements, delayed approvals and changes in policy; and
- **Supply chain**
Including difficulties with the supply chain into the organisation.

Whether in Africa or elsewhere, many projects experience delays because they don't get off to a good start to begin with. There could be ill-defined cost and schedule estimates, as well as a failure to define the scope clearly and set reasonable expectations. Sometimes politicians and sponsors suffer from 'optimism bias' and set unrealistic deadlines and budgets in an effort to demonstrate their commitment to action and service delivery, only to face the media and stakeholders with disappointing news later.

Poor estimates during project planning and unrealistic or poor adherence to critical path deadlines are the largest contributors to project failure, according to *Insights and Trends*, PwC's 2012 global survey of project management leaders.

"Delays are caused by the complex nature of oil & gas projects and lack of certainty in the projects, which are the first of this nature in Africa."

– Survey respondent
Oil & gas sector
Operations across sub-Saharan Africa

Among the various sectors covered in our survey, respondents in the power and oil & gas sectors ranked governmental complications and regulatory and legal requirements high on their list of reasons for project delays. The lack of timely completion of environmental impact analyses as well as slow decision-making and approval processes all contribute to project time overruns.

Availability of funding and the policy and regulatory environment were the main concerns for respondents in the mining sector and government. Transport sector respondents identified the impact of external, unplanned factors such as weather and the physical condition of sites as well as the availability of skilled resources in the market as some of their main challenges.

One survey respondent reported delays of more than six months and commented that delays are longer with government-funded projects, mainly because of funding limitations and changes in scope.

Problems with labour and labour unions can also contribute significantly to project delays. It is estimated that 50% of construction companies operating in South Africa were affected and projects were delayed when around 90 000 workers downed tools in August 2013.

Although cost increases for construction firms are the most immediate impact of the strikes, as workers demanded a 40% wage increase, the action is likely to further dent the investment climate in the country, which is only just beginning to show signs of recovery.

Another South African example is the construction of two coal-fired power stations, Medupi and Kusile, which have been running behind schedule with significant cost overruns, due partly to labour problems.

State-owned power utility, Eskom, said the first power from its Medupi plant would hit the grid only in the second half of 2014, a delay of at least six months that will increase the cost of the project and possibly cause a gap in supply in 2014. The power utility said it was working with stakeholders to ensure security of electricity supply despite the delay caused by labour unrest and 'underperformance' by contractors. Medupi was beset by a series of illegal strikes for five months from December 2012, the longest of which lasted six weeks.



Budget overruns

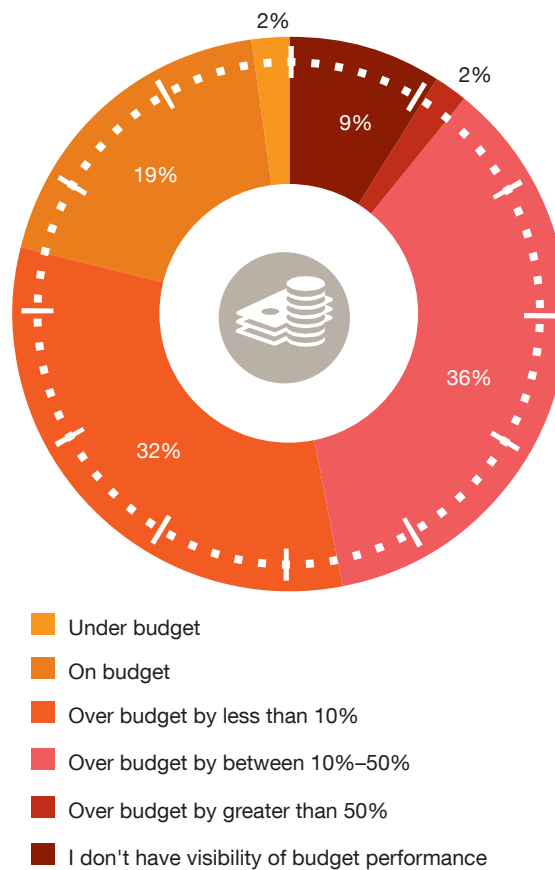
Delays, of course, usually result in budget overruns, which bedevil many projects and not only in Africa. In fact, a PwC analysis of industry research found that mega projects often exceed their budgets by 50% or more.

In our survey, 36% of the respondents indicated that their projects had run over budget by between 10% and 50%. Surprisingly, 2% indicated they had come in under budget. Respondents from all three regions in sub-Saharan Africa reported a similar number of projects with budget overruns of between 10% and 50%.



Figure 11: Cost variances in the last 12 months

Q: On average, to what extent have your capital projects experienced cost variances from the original business case, in the past 12 months?



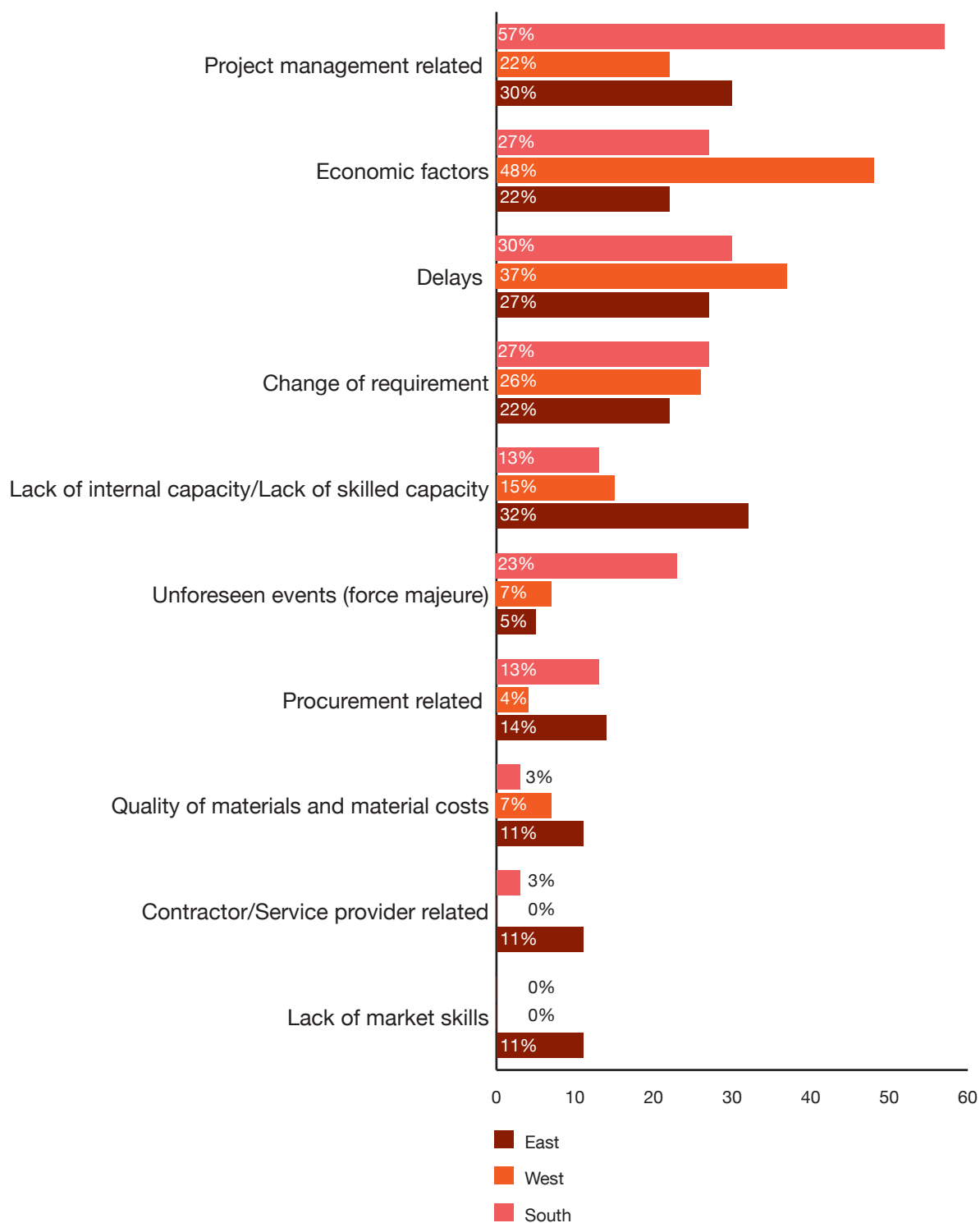
Base: 95 respondents
Source: PwC analysis

Respondents attributed cost overruns to delays in client decision-making, the government approval process and completion of commercial agreements. Respondents also cited project management issues such as poor planning or design work and insufficient project preparation as reasons for delays.

Project changes such as failure to achieve a design freeze or variations in design after commencement were further highlighted as a significant cause of cost overruns, along with economic factors, including inflation, currency depreciation and currency exchange controls.

Figure 12: Top three reasons for cost variances in the last 12 months

Q: What do you consider your top three reasons for these cost variances?
(Summary of top three reasons)



Base: 95 respondents
Source: PwC analysis

The main reason for cost overruns varied by region: In East Africa, respondents cited lack of internal capacity and lack of skills as the main causes. Economic factors were the leading cause of cost variances in West Africa, while in Southern Africa, project management problems were the most frequent cause.

Overall, across all regions, a lack of project cost estimation, commercial management and project management skills usually underlie the problem of cost overruns. Some survey respondents cited such project management deficiencies as poor planning, poor technical decision making, inadequate risk assessments, lack of proper controls and inadequate monitoring of projects.



Most common factors that cause cost overruns



Source: 'Correcting the course of capital projects', PwC, 2013.

The skills shortage is a well-known challenge for many countries across the continent. Members of Africa's diaspora work across most developed markets, having left their country of origin during the 1980s and 1990s.

Sufficient engineering skills are essential to the provision of infrastructure. The shortage of engineering capacity (skills, experience and capabilities) to fill the needs of the large infrastructure development that African economies require is evident in most countries.

Intrinsically linked to the lack of skills in the market is the lack of internal capacity, and respondents made reference to the lack of internal capacity to plan, procure, manage and implement capital infrastructure projects a number of times as a challenge to the delivery of capital projects.

The construction and engineering fields, essential to driving infrastructure projects, are seeing a growing talent gap as experienced staff and especially those at management level are retiring and leaving the workforce or changing focus and moving out of construction into other sectors. These gaps leave teams of inexperienced staff to manage the development, build and operation of large complex infrastructure projects.

Scope creep is definitely a major culprit in budget overruns on projects throughout the world. Budgets often balloon because of design or specification changes in the midst of construction. This is much more expensive than incorporating these features in the original design. The goal should be to make as few changes as possible once construction commences. Sometimes, it's better to get the initial project completed and reserve some of the enhancements for a later date and a separate contract or phase. Often, however, there's lack of transparency and control around project changes. Owners may not fully understand the financial impact of change orders until it's too late.

Early on, one of the biggest mistakes is starting construction before design and other project criteria are fully defined. This leads to inevitable change orders and difficulties in facilitating various

“There is an imbalance in many economies in Africa between the demand for skilled labour and supply. Larger companies can leverage a regional workforce to good effect by sending skilled people on secondment or setting up ‘hub’ operations in markets with a stronger skills base.

Other companies may outsource skills in growth markets or enlist third parties like subcontractors (who may be foreign-born).”

– Alan Seccombe

*Human Resource Services Partner, PwC South Africa
The Africa Business Agenda, PwC, 2014*

elements of design. An oil refinery project, for example, had some major mistakes in its preliminary design and the owners had to go back to the drawing board because when the equipment arrived, it didn't fit into the allocated space. The initial budget of US\$500 million swelled to US\$1.2 billion.



Lack of internal capacity to plan, manage and implement large infrastructure projects, which often run across multiple years, is a challenge across the region



Project quality problems

Quality problems on capital projects can be costly in terms of added expense and delays. For example, in addition to labour problems, Eskom's Medupi power station also experienced welding faults on the boilers and delays in the installation of a software system that was a critical part of the boiler safety mechanisms.

About a third of survey respondents said there were quality problems or variations from original specifications in some or most cases on their projects, while 42% said that only in very few cases did they experience quality problems.

Main causes of quality problems by regions

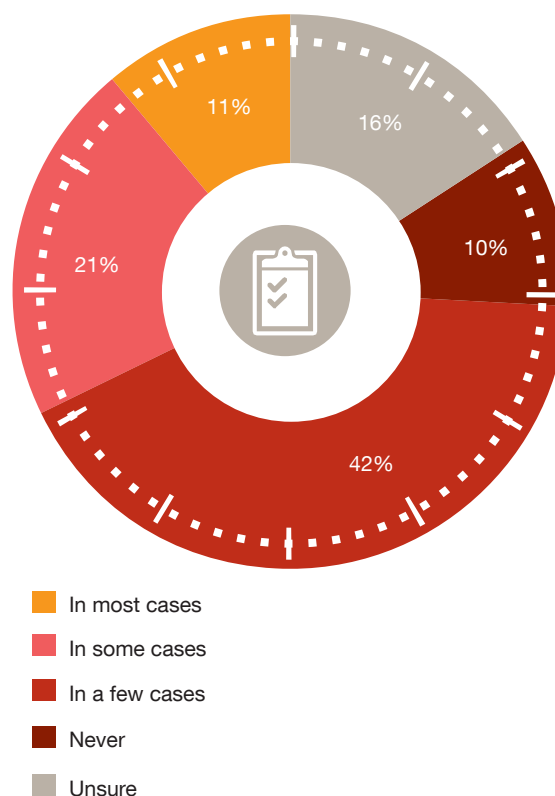
East Africa
Inadequate skills and capacity

Southern Africa
Poor project management skills

West Africa
Quality of materials

Figure 13: Extent to which capital projects experienced quality issues


Q: On average, in the past 12 months, to what extent have your capital projects experienced quality problems or variations from the original specifications?



Base: 95 respondents
Source: PwC analysis

When there were problems, these resulted from poor project management skills and planning; inadequate supervision of external contractors and other contractor issues, including lack of adequate skills and corruption; substandard materials or lack of quality materials; and inadequate capacity to deliver, resulting in poor workmanship and non-adherence to quality standards.

Respondents in East Africa named inadequate skills and capacity to deliver as the main cause of quality problems, while those in the West Africa primarily cited materials-related issues and those in Southern Africa cited poor project planning and management skills.



Owners are sometimes tempted to transfer too much risk to contractors and end up increasing their own risk in other ways. If an owner awards a fixed-price contract and shifts the cost risks to the contractor, the contractor may choose to mitigate that risk by hiring less experienced labour or using less expensive materials, creating a quality risk for the owner. In many cases a contractor will also price in their view of the risk profile of the project, hence the owner may pay too high a price premium for inappropriately transferred risks.

The growing talent gap in the construction and engineering fields has the potential to spell trouble for projects in many countries.

Respondents to our survey noted the growing use of foreign contractors due to a lack of local skills and expertise. For example, China Harbour Engineering has been awarded a US\$150 million contract by the Ghana Ports and Harbours Authority for the construction of a port as part of the Takoradi Port Infrastructure Development Project. Similarly, in Côte d'Ivoire, the Henri

Konan Bédié Toll Bridge project was awarded to the French construction company Bouygues for the building and operation of the 8km north-south connection linking the suburbs of Marcory and Riviera.

Retaining foreign contractors isn't necessarily a positive development for project owners, developers or for Africa's future growth. Depending on a country's immigration requirements, there may be long lead times to be able to utilise foreign contractors, potentially making it more difficult to meet the project's schedule. In addition, the use of contractors does little to help build the skills and capacity of local people unless the contractors are tied into stringent skills transfer programmes. Furthermore, the contractors' compensation for their work flows back to their homeland and isn't necessarily being reinvested in the country where the project is being undertaken.

Along with project contractors and labourers, government entities also received some blame in our survey for quality issues.

"Appropriate skills in local government agencies and line ministries are often inadequate to assess and plan appropriately for the formulation and management of infrastructure development and services, as well as the enforcement of policies and regulation," according to the Infrastructure Consortium for Africa. "This lack of technical capacity leads to a coordination failure on the part of government, across the myriad of local agencies involved in delivering infrastructure services."

"All the projects done had experienced quality problems mainly because of the bureaucracy due to ministry interference in projects."

*– Survey respondent
Operations across multiple sectors
East Africa*



10% of respondents said that they did not complete any form of independent reviews

Reporting and review process

Proper governance and control processes are essential for spotting problems early and shifting projects back on track quickly. The more time and effort companies put in at the outset, the greater the chance they will keep projects in check throughout the construction cycle.

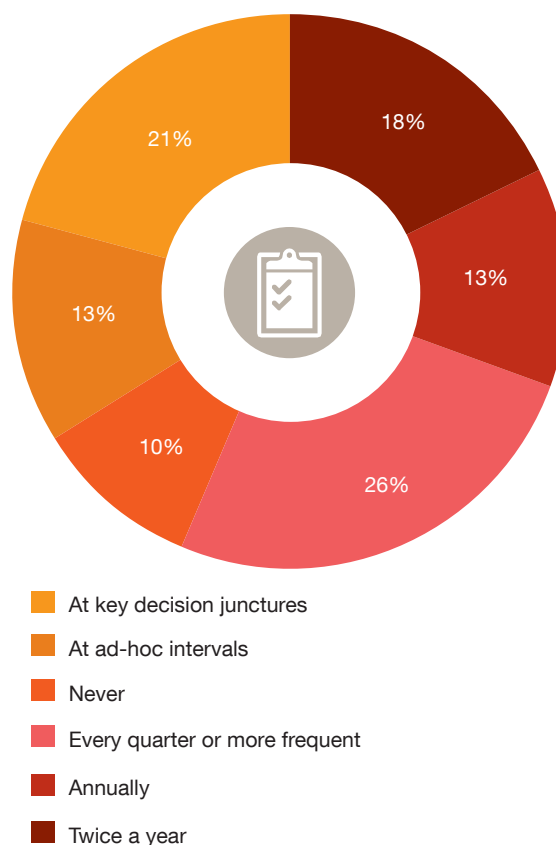
Yet owners often fail to establish the proper project governance and management structure, monitoring procedures, document control and risk management processes. As a result, they don't anticipate risk adequately and don't build in the necessary contingency plans or have a proper audit trail of documents and decisions. Because of shortcomings in project controls, they are often unaware of the severity of delays and cost overruns until well after a project gets off course.

Survey respondents reported mixed performance on their reporting and review processes. Most said status reporting was done on a consistent basis to all stakeholders. More than three-quarters had defined infrastructure master plans, but only 21% completed independent reviews of their projects for quality, risk and financial performance at key decisions points, while 12% said they completed reviews on an ad-hoc basis and 10% said they did not complete any form of independent review of projects.

An essential element of sound project controls and governance is ensuring that stakeholders and decision-makers receive adequate warning of problems and potential risks. Regular and detailed reporting to the right people at the right time is vital.

Figure 14: Frequency of independent risk, quality and financial performance reviews

Q: How often are your capital projects subject to an independent review for quality, risks and financial performance?



Base: 95 respondents

Source: PwC analysis

Although most respondents indicated that the project team regularly reported to various stakeholders during the course of their projects and did not feel that reporting was an issue for their organisations, almost 50% had project delays of more than six months and only 19% of respondents reported completing

their projects on or below budget. This raises the question of whether the correct information is being reported with sufficient depth and details to highlight the salient risks and issues.



Priorities for improvement

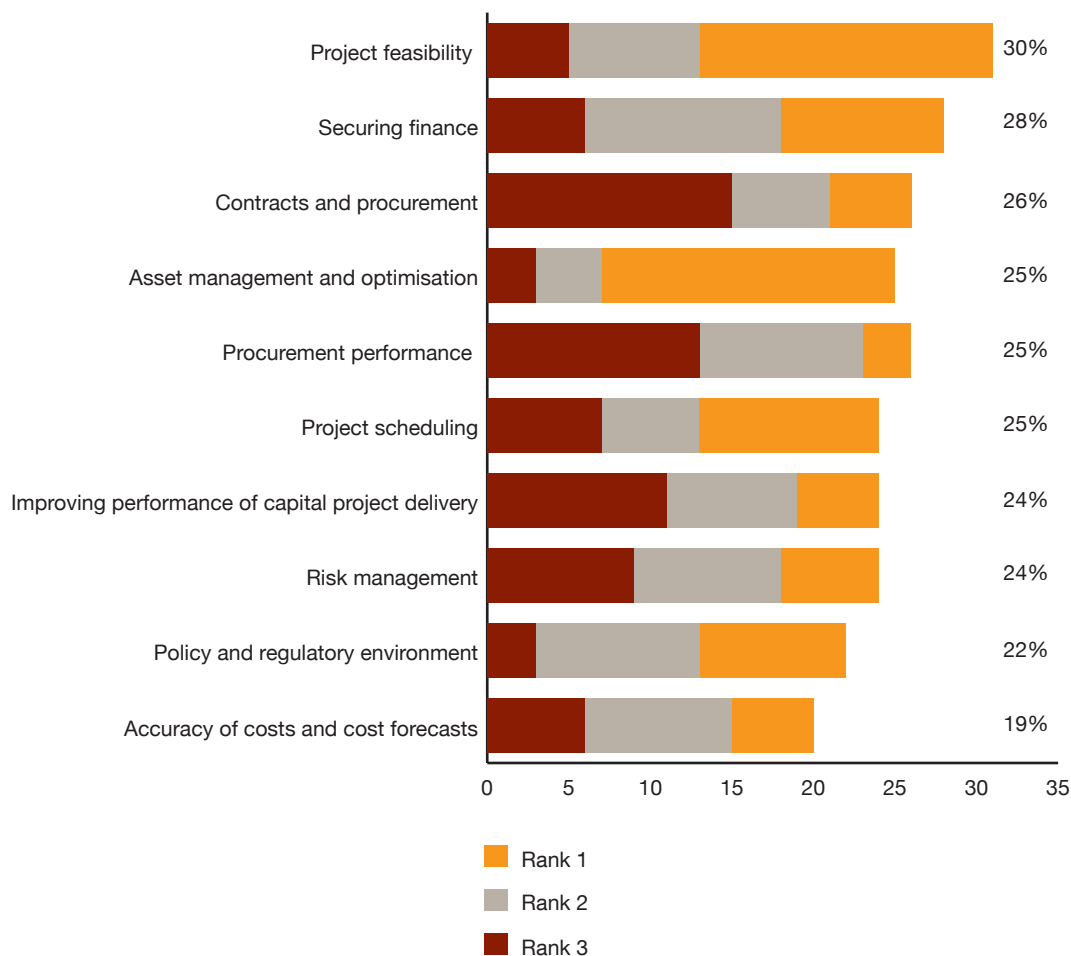
Survey respondents named project feasibility as their top priority for improvement in relation to capital projects. Ensuring projects are viable is a core consideration before embarking

too far down the path of planning. Respondents also cited the areas of project scheduling (completion date forecasting and reliability of data in schedules); contracts and procurement

(procurement performance); asset management and optimisation; and improving performance of capital project delivery. Once again, securing finance was top of mind.

Figure 15: Priorities for improvement in capital projects

Q: What are your top three improvement priorities in relation to your capital projects?



Base: 95 respondents
Source: PwC analysis

Priorities for improvement varied by region.

Priorities for improvement by region include:

Region	Priority
East Africa	Securing finance Procurement performance Policy and regulatory environment
West Africa	Contracts and procurement Project scheduling (forecasting to completion)
Southern Africa	Risk management Asset management and optimisation Upfront planning

Priorities for improvement varied by sector too. Multiple sectors identified project feasibility as one of their top three priority areas. Up-front planning was a notably more important priority for local government than for other sectors. Respondents in the transport sector noted asset management and optimisation as one of their key priorities, mining and water noted risk management, energy and oil & gas cited project feasibility.

In terms of their current operational assets, respondents said their highest priorities were improving asset performance and developing an overall asset management framework, including a strategy, plan, and asset risk framework. Some indicated that they hope to implement major IT systems relating to asset management and maintenance strategies, and to develop asset life cycle plans in conjunction with establishing asset condition/performance monitoring systems.

In many cases, infrastructure underinvestment has resulted in a need for a complete overhaul of assets. Organisations should consider how effective they are in the maintenance and operation of their current asset base before considering the viability of adding new assets.

“Demand is increasing, assets need refurbishing and the government funding is reducing.”

*– Survey respondent
Power sector
Operations across multiple countries*

52%

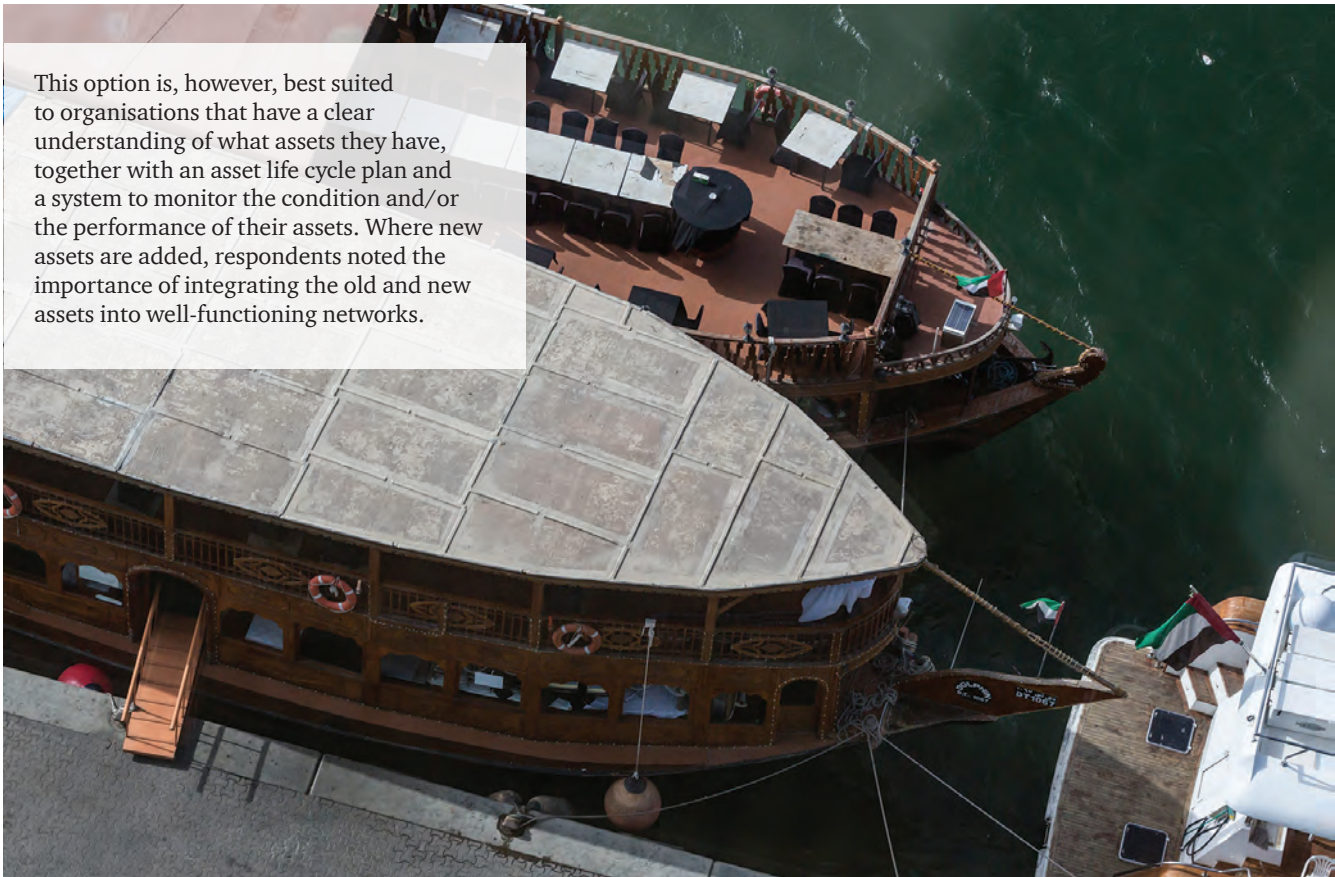
of respondents said improving asset performance was one of their top priorities

26%

said implementing maintenance strategies (e.g. RCM, FEMEA) was key

25%

said a priority was implementing major IT systems relating to asset management (e.g. Maximo, SCADA)

An aerial photograph showing a large, ornate wooden boat with a multi-tiered, tiled roof. The boat has a reddish-brown deck and is docked at a concrete pier. A smaller, more modern white boat is partially visible next to it. The water is a deep green color.

This option is, however, best suited to organisations that have a clear understanding of what assets they have, together with an asset life cycle plan and a system to monitor the condition and/or the performance of their assets. Where new assets are added, respondents noted the importance of integrating the old and new assets into well-functioning networks.

“The need to improve infrastructure to drive economic development is undisputed. The survey makes clear that the availability of funding is a common and critical challenge. However, capital does not track needs, it tracks opportunities. To ensure the need for infrastructure is viewed as an opportunity to provide capital by funders, some of the other challenges identified in the survey such as political risk, policy and regulatory clarity and the availability of appropriately skilled resources must be addressed.”

*– Mohale Masithela
CP&I Deals Leader, PwC South Africa*

Local content in capital projects

Attention is increasingly focusing on enhancing the national economic spend of a country related to publically funded capital projects. This is often part of a broader industrial policy that seeks to enhance local sustainable economic growth and increase domestic employment by localising capital project expenditure.

There are various policy instruments that governments can use to increase local content.

The most direct of these is to stipulate or mandate targets for the proportion of goods and services that are produced domestically in respect of the delivery of a project. Other policy instruments require the use of certain locally based entities or local companies to deliver or be part of the supply chain to deliver specific projects. Capital assistance grants to local companies can also be used to ensure competitiveness and these are often based on economic sectors that are identified as requiring specific local support.

In South Africa, percentage local content requirements are frequently used for capital projects. These often correlate to priority sectors identified for industrialisation in the Government's Industrial Policy Action Plan (IPAP). These sectors include automotive, aerospace & defence, rail transport equipment, green industries, agro-processing, plastics, pharmaceuticals, chemicals and business process services. In other African countries such as Nigeria localisation is encouraged, particularly in the oil & gas sector.

In a diverse economy with a strong industrial base, South African projects generate high levels of local content, particularly for capital projects with a high proportion of civil work and construction such as roads, railways, dams, housing, ports and buildings. For energy projects, levels of local content vary depending on the nature of the project. South Africa's well-developed electrical equipment industry sustains high levels of local content in distribution and even primary energy generation from coal. However, in more complex projects where technology trends are rapidly changing, such as renewable energy, levels of local content are lower.

In many African countries levels of local content are low as a result of a lower supporting industrial base, with even construction being an imported function. There are, however, major opportunities to increase local content in such projects, where local contractors can be used and brought up to the standard required. The same is true for projects that have an industrial requirement such as for cement, fabricated steel and other relatively high-value items that could be locally constructed.

The economic multiplier benefits of localising a large portion of inputs that would normally have been imported are significant. Estimates from Transnet indicate that reaching local content targets of 60% to 70% are likely to result in local economic multipliers of 2–2.5 times the initial transaction value.

Increasing local content brings inherent challenges:

- Local content measures are often overstated and when more carefully measured they include many imported components or overstate local value addition;
- Measuring local content to accurately determine real values is expensive and fraught with difficulties. In South Africa, for example, using local content standards often results in misrepresentation of invoice values and other financial flows in order to artificially raise the level of local content for particular items; and
- Stipulating local content percentages does not always provide sustainable manufacturing benefits, with assembly plants and related industries set up only for the life of a project, with little intention to productively produce these items in the long term.

Some of the benefits of forcing or encouraging local content are that:

- Related local industries benefit and often become more diverse in their product offering;
- Such industries often have to work with their international counterparts in a joint venture or similar structure and this allows them to develop valuable intellectual property and process capabilities; and
- Training and other supplier development requirements have often been stipulated along with local content and these enhance capability and the transfer of skills from international providers to local industries.



Sector profiles

Transportation

Transportation accounts for a large proportion of infrastructure investment in most sub-Saharan countries. Nevertheless, the quality of roads and railroad networks still lags far behind much of the rest of the world and they are in serious need of improvement. Many roads remain unpaved and most rail lines – constructed during the colonial period – are in poor repair and outdated. The road access rate in Africa is only 34%, compared with 50% in other parts of the developing world.

As Africa's economies look to develop, it will be critical to create solid transport networks that span regions and the entire continent. Improved road and rail linkages between economic centres, resource-intensive export zones and the port and airport linkages to the global economy will spur greater cross-border trade.

Derelict and inefficient transportation infrastructure increases the costs of moving goods, reducing the competitiveness of businesses, and impacts intra-country and inter-country trade. In many African countries there is just insufficient capacity to export much of the resource wealth that lies inland.

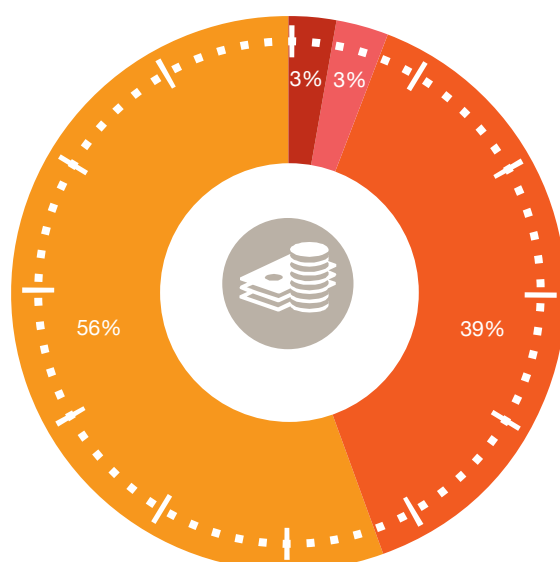
The African Development Bank reports that high transport costs add up to 75% to the price of goods in Africa. It also notes that 30 countries have chronic power outages. It suggests that bridging these gaps alone could add two percentage points to Africa's annual GDP growth rate.

Our survey is encouraging in that it shows there is at least a short-term commitment to boost investment in transportation infrastructure in sub-Saharan Africa. More than half of respondents in the transport sector said they planned to increase their capital project spending by more than 25% over the next 12 months. Another 39% said their spending would also rise, but by a smaller percentage. Slightly more than half of transport respondents said their capital project spending in fiscal year 2012 ranged between US\$100 million and US\$500 million.

Over the next decade, spending on the various transport sub-sectors is expected to continue growing, driven by the need to access the natural resources of the region and achieve the goals of economic development

Figure 16: Transport: Outlook for capital spending in the next 12 months

Q: What is your outlook for your capital project spend/funding for the next 12 months?



- Significant increase (> 25%)
- Marginal increase (<= 25%)
- Expenditure same as last financial year
- Marginal decrease (<= 25%)
- Significant decrease (> 25%)


Base: 37 respondents operating in the transport sector
Source: PwC analysis

49%



of transport sector respondents experienced delays for more than six months on their projects

50%



of transport sector respondents spent US\$100-US\$500 million on capital infrastructure in the fiscal year 2012

There is a firm commitment from funding organisations and governments to develop transport infrastructure across sub-Saharan Africa and increasing attention now focuses on linking many of the transport corridors to create a more effective integrated transport network.

Over the next decade, spending on the various transport sub-sectors is expected to continue growing, driven by the need to access the natural resources of the region and achieve the goals of economic development.

Anticipated spend on transport infrastructure across sub-Saharan Africa

Sector	Estimated total spend by 2025	Anticipated annual spending growth rate	Countries with largest spend planned by 2025
Road networks (including bridges and tunnels)	US\$200 billion	8.2%	Nigeria: US\$104 billion South Africa: US\$43 billion Mozambique: US\$16 billion Ghana: \$1.6 billion
Rail networks (including stations and terminals)	US\$78 billion	8%	South Africa: US\$32 billion Ethiopia: US\$25 billion Ghana: US\$86 million
Ports	US\$25 billion	7.8%	Nigeria: US\$13 billion Kenya: US\$8 billion
Airport	US\$7 billion.	7.1%	South Africa: +/-US\$2 billion Tanzania: +/-US\$2 billion

Source: PwC, Capital project and infrastructure spending outlook to 2025

Mozambique has the least developed road infrastructure in Southern Africa. But road networks are expected to be the largest contributor to infrastructure with spending on this sub-sector reaching an average annual growth rate of 10.9%, spurred on by the desire to unlock the economic wealth from the recent significant gas finds in the country.

Rail is a key transport sector providing an alternative mode of transport for commodities and reducing the strain on road networks. In South Africa, improving the rail network is one of the government's top priorities, with projects aimed at increasing freight rail volumes and container traffic market share. Ghana has extensive plans for rail modification and expansion, with new lines extending into the northern interior of the country and substantial improvements of existing lines in the coastal regions.

Up till now, most investment in rail in the region has been driven by commercial and industrial-related rail projects. With increased urbanisation and integration, it is anticipated that there will be an increased demand for passenger rail transport linkages. Historically, different rail gauges have been used in different countries, making

the integration of networks across borders more difficult. An even greater challenge in achieving this integration is that there has been insufficient maintenance and rehabilitation of the existing rail infrastructure.

“Rail connection remains poor due to inoperable systems and non-harmonised gauges between countries. With such hindrances, it is hardly surprising that intra-regional trade accounts for a mere 12% of Africa’s trade with the rest of the world.”

*– Dipuo Peters
South African Minister of Transport
‘Leading Transport into the future’, Transport World Africa
10 July 2014*

Ports play a key role as trade entry and exit points to Africa. Ports in sub-Saharan Africa have found themselves under severe pressure due to congestion and constrained capacity as a result of increased demand for goods. Long docking waiting times, increases in port dwell times, poor handling capabilities, inefficient port layouts and slow clearance by regulatory agencies are some of the issues plaguing the sector. This, coupled with inadequate or non-existent road and rail network interfaces with ports, further hinders trade and increases the cost of commodities.

A report published by the World Bank in 2012 indicates that the average cargo waiting time at ports in sub-Saharan Africa (excluding the Port of Durban in South Africa) is nearly 20 days, compared to the international standard for port dwell of three to four days.

The importance of air transport should not be underestimated as it provides landlocked countries with an alternate trade route and a means of passage for people. It is forecast that many of the airports in sub-Saharan Africa will exceed their capacity in the coming years, as the demand for air travel increases. As with other infrastructure sectors in the region, the quality of the aviation sector varies by country.

Kenya is considered the regional leader in air travel, with the fourth-largest domestic air sector in sub-Saharan Africa. South Africa's air infrastructure is in excellent condition following numerous upgrades completed in preparation for the 2010 FIFA World Cup.

In West Africa, the International Air Transport Association has identified lack of aviation experts and skills as a major source of concern for the West African aviation sector. Safety and security are additional challenges they are facing in this sector. In 2011, the average number of air traffic accidents in West Africa was nine times higher than the global average.

There are a multitude of transport corridors already in existence across the region or under construction. In East Africa, the largest and most

ambitious project by far is to open up a new trade route to the interior – the Lamu Port-Southern Sudan-Ethiopia Transport (LAPSSET) corridor project. At an estimated cost of US\$23 billion, the corridor aims to better integrate the three countries and promote improved cross-border trade and overall economic growth in the region.

The project will encompass the building of a new port at Lamu in northern Kenya, which will link to an oil pipeline and a transport corridor comprising road and rail. The pipeline will allow South Sudan to reduce its reliance on Sudan for oil transport infrastructure.

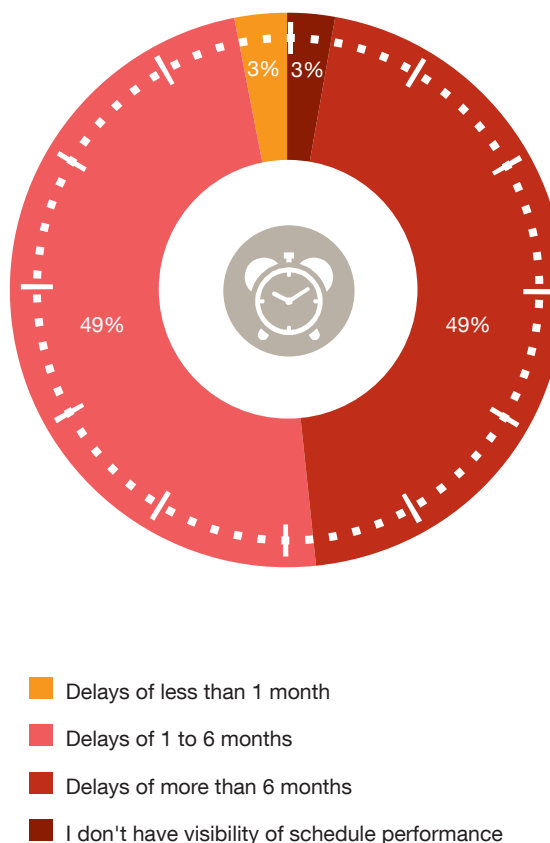
The Nacala Road Corridor Project in Mozambique aims to provide landlocked Malawi, Zambia and the interior of Mozambique with a road transport

linkage to the port of Nacala while the North-South Transport Corridor links the Port of Durban to the Copperbelt in the DRC and Zambia with spurs linking the Port of Dar es Salaam and Malawi. All of these corridors have the primary objective to facilitate cross-border trade.

Transport project developers in Africa face a number of challenges. All but two of our survey respondents in the transport sector said they experienced delays in project delivery, with a roughly equal number experiencing delays of more than six months or delays of one to six months on projects over the past year. Forty percent of respondents said they had budget overruns of between 10% and 50%, while 29% cited cost variances of less than 10% and about one quarter reported being on budget.

Figure 17: Transport: Delays to the completion of infrastructure projects

Q: On average, to what extent have capital projects in your portfolio experienced delays in the past 12 months?



Base: 37 respondents operating in the transport sector
Source: PwC analysis

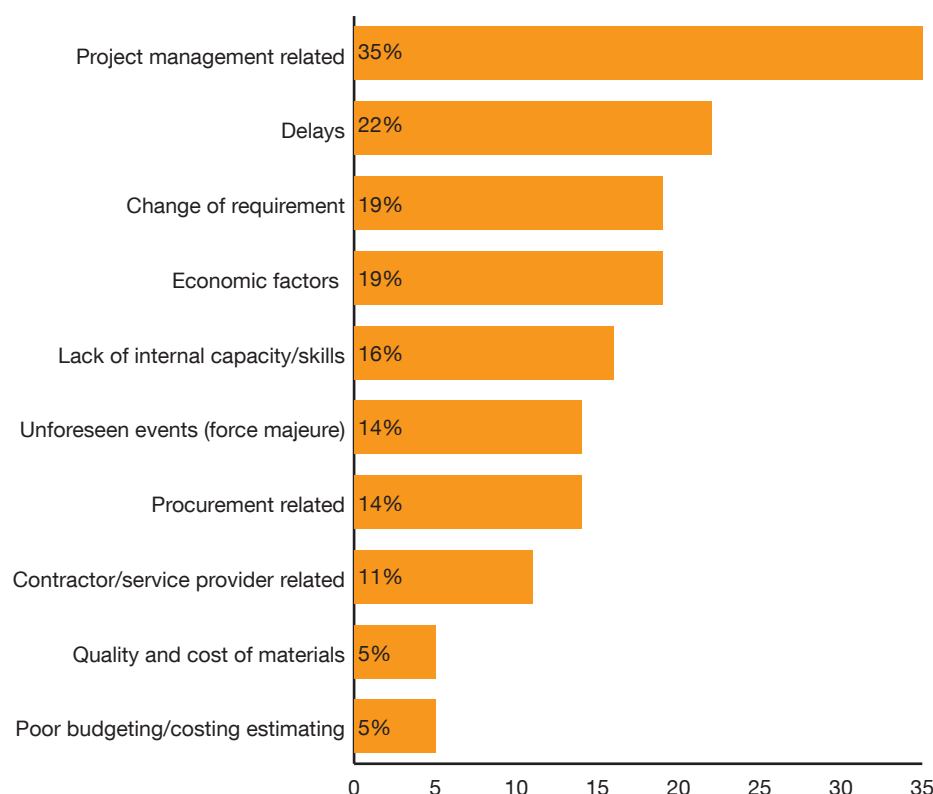
Transport respondents attributed time delays primarily to internal problems such as weak planning and project management and thereafter to funding issues. The primary cause of

cost variances was also cited as project management issues such as poor planning, poor design and rushing to construction.



Figure 18: Transportation: Top three reasons for projects exceeding budgeted costs

Q: What do you consider your top three reasons for cost variances?
(Summary of top three reasons)



Base: 37 respondents operating in the transport sector
Source: PwC analysis

Transport respondents said the greatest challenges to their capital projects include internal capacity to plan and manage projects, the availability of funding and the availability of skilled resources in the market. External factors/unplanned – for events such as unforeseen ground conditions, standing time and variation orders on most projects (dig then find) were highlighted as factors impacting on the timely completion of projects. The policy and regulatory environment was also raised as a challenge by our respondents.

Infrastructure improvements are not limited only to the physical assets but extend to the intangible components of regulatory reforms and policy frameworks. Customs and clearance policies, trade agreements, tariffs, import permits and export licences are just a few of the regulations and policies underpinning the transport sector. With the increasing private sector involvement in transport infrastructure there is the requirement for clearer regulatory certainty (in rail, roads and airports), which is absent in many countries.

Certain countries have made strides in this area. In Zambia, for example, President Michael Sata's anti-corruption drive has improved oversight of infrastructure procurement, and both the state power company ZESCO and the Road Development Agency have seen high-level personnel changes in an attempt to improve oversight in public sector contract awards.

The associated impact of road traffic congestion on an economy is becoming a growing concern across many of the major cities in sub-Saharan Africa. Increased time in the

China is playing a significant role in the funding of infrastructure

logistics chain correlates to increased costs of goods. Lost productivity time for employees, poor air quality affecting health and the environment, and the deteriorating quality of road infrastructure due to the high volume of usage, are all consequences of this increased congestion. And these have the potential to directly or indirectly hinder economic development and growth.

Countries in the region are looking to more efficient means to transport people through the construction of Bus Rapid Transport systems (BRTs), Light Rail Transits (LRTs), subways and the like. In Nigeria, the Lagos Metropolitan Area Transport Authority is constructing a high-capacity LRT line between Okokomaiko, Iddo and Marina which will be isolated from car traffic to ease road congestion and improve the flow of commuters. However, all this infrastructure development requires substantial funding.

The respondents to our survey reported that government could not deliver the required infrastructure without assistance from the private sector. In fact, about half of the transport respondents said they expect public-private partnerships to be used more frequently in Africa for capital projects. Several countries have been initiating PPPs to raise financing. Ghana's Tamale Airport project is underway via a PPP and Kenya is planning a PPP to develop the Port of Mombasa. Uganda plans to use the model to run Kampala's waste management system.

An example of the impact of financing on infrastructure projects is the Lamu portion of the LAPSSET project that was started in March 2012, but ran into funding difficulties and stalled. In April 2013 a consortium of companies led by China Communications Construction Company (CCCC) won a US\$484 million contract to build the first three berths at the Port of Lamu, but subsequent lack of funding has stalled the project again.

China is playing a significant role in the funding of infrastructure in the transport sector in sub-Saharan Africa. Its involvement in the region spans project funding to direct construction. The key

focus is railways, often with emphasis on supporting access to Africa's mineral resources. China has also heavily invested in airports, roads and ports.

In East Africa, China Merchants Holdings (International) Co Ltd has signed a framework agreement with the Tanzanian authorities to develop a new port in the town of Bagamoyo to the value of approximately US\$10 billion. In March 2013, China pledged to provide US\$5 billion in open-ended financial assistance to Transnet (South Africa's largest integrated freight transport company) for its rail infrastructure upgrade programme.

Chinese companies are also making their mark in West Africa, where the US\$1.49 billion Lagos-Ibadan railway contract has been awarded to China Civil Engineering Construction Corporation (CCECC) and the Olokola deepwater port project has been awarded to China Ocean Shipping Group. Meanwhile, China Harbour Engineering has been awarded a US\$150 million contract by the Ghana Ports and Harbours Authority for the Takoradi Port Infrastructure Development Project.

Countries are looking to more efficient means to transport people

Most noticeable has been the approach by oil & gas and mining companies which, in the absence of much of the infrastructure needed, are taking a 'build-your-own' approach, and providing their own funding. In PwC's latest *Oil & Gas review, 2014* respondents indicated that their companies would be predominantly relying on their own cash flows to fund their businesses.

The issuing of bonds and sovereign debt are alternate means of raising finance. In September 2012, Zambia made its inaugural entry on the international capital market and raised US\$750 million through a bond issue. The bond proceeds were allocated among a number of infrastructure sectors with transport planned to receive US\$430 million. The World Bank's Multilateral Investment Guarantee Agency (MIGA) recently started providing political risk guarantees to debt financiers to encourage investment.

Efficient transport is a crucial component of growing a strong economy, and robust transportation infrastructure is critical to a well-functioning transport sector.

Integration of transport network plans into broader urban development master planning is essential to ensure that effective and sustainable developments are put in place for the longer-term movement of people and goods into and out of towns, cities, and regions. Across sub-Saharan Africa it is readily apparent that this sector requires substantial rehabilitation and maintenance.

At the same time, consideration must be given to regulatory reforms and frameworks to facilitate enhanced cross-border activity. Lengthy and highly administrative customs procedures and clearance policies, restrictive import permit and export licence regulation and inconsistent trade agreements all increase the costs of commodities and make the continent less competitive. It is only through reform at both the physical infrastructure and regulatory levels that the region will be able to fully capitalise on its potential.

"Government cannot deliver in mega projects and hence requires private capital participation."

**– Survey respondent
Transport sector
West Africa**

Oil & gas

Sub-Saharan Africa pipelines

With exciting new discoveries being made in many parts of the African continent, the region continues to appeal to investors looking to participate in the next frontier of oil & gas activity.

Africa's share of global oil production has dropped slightly since last year, moving it from 12% to 10% of the world's total. But untapped proven oil reserves on the continent are estimated to be around 8% of the global total, and these reserves continue to increase with new discoveries. In 2013 alone, six of the top 10 global discoveries by size were made in Africa.

New players to enter the sector include Mozambique, Tanzania, Kenya and Uganda and following improvements in the regulatory environment in East Africa, there is renewed interest in the region's hydrocarbons. East Africa, and specifically Mozambique, is set to become one of the largest LNG exporters in the world, with Qatar and Australia being the two countries ahead of Mozambique. This will put East Africa on the global LNG map.



“The [gas] finds in Tanzania and Mozambique are significant but market economics will decide their future. Massive infrastructure investment will be required and billions of dollars of project finance will need to be raised on the international markets to fund it.”

– Alex Vines

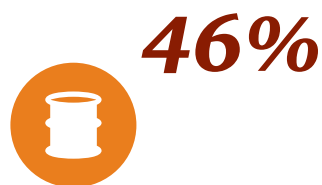
*‘Africa’s Expanding Energy Landscape’
CBC Africa Infrastructure Investment Report, 2013*

Sub-Saharan Africa has a wealth of natural resources and many of these remain untapped due to lack of infrastructure to access, process and transport these resources.

Spending on infrastructure, of course, will be critical if these resources are to be monetised. For example, huge capital investments will be required to fund the required infrastructure for natural gas exploitation in Mozambique and Tanzania. The advantage, that these countries have over West Africa, Australia and other natural gas producers, such as price and location, may be lost if investment and development continue at their present slow pace. There are also large developments in LNG and gas in North America, which means that speed to market will be critical, as we are heading into an oversupply situation in the short to medium term in the LNG market.

Infrastructure spending for petroleum and natural gas extraction is expected to grow at an average annual rate of 7.1% in sub-Saharan Africa between now and 2025, resulting in a total investment of \$8 billion over that time period. The key challenge, however, is the ability of economies to fund and execute these projects, given their size relative to the national GDP.

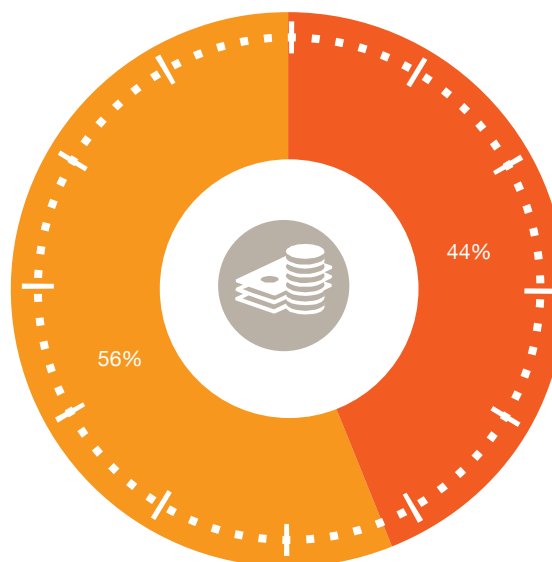
In the short term, more than half of the oil & gas industry respondents in our survey said they planned to increase their capital project spending by more than 25% over the next 12 months. The remainder said their spending would rise, but by a smaller percentage. About half of respondents in the sector said their capital project spending in fiscal year 2012 ranged between US\$100 million and US\$500 million.



46%
of respondents in the sector said their capital project spending in fiscal year 2012 ranged between US\$100 million and US\$500 million

Figure 19: Oil & gas: Outlook for capital project spending in the next 12 months

Q: What is your outlook for your capital project spend/funding for the next 12 months?



- Significant increase (> 25%)
- Marginal increase (<= 25%)
- Expenditure same as last financial year
- Marginal decrease (<= 25%)
- Significant decrease (> 25%)

Base: 26 respondents operating in the oil & gas sector
Source: PwC analysis

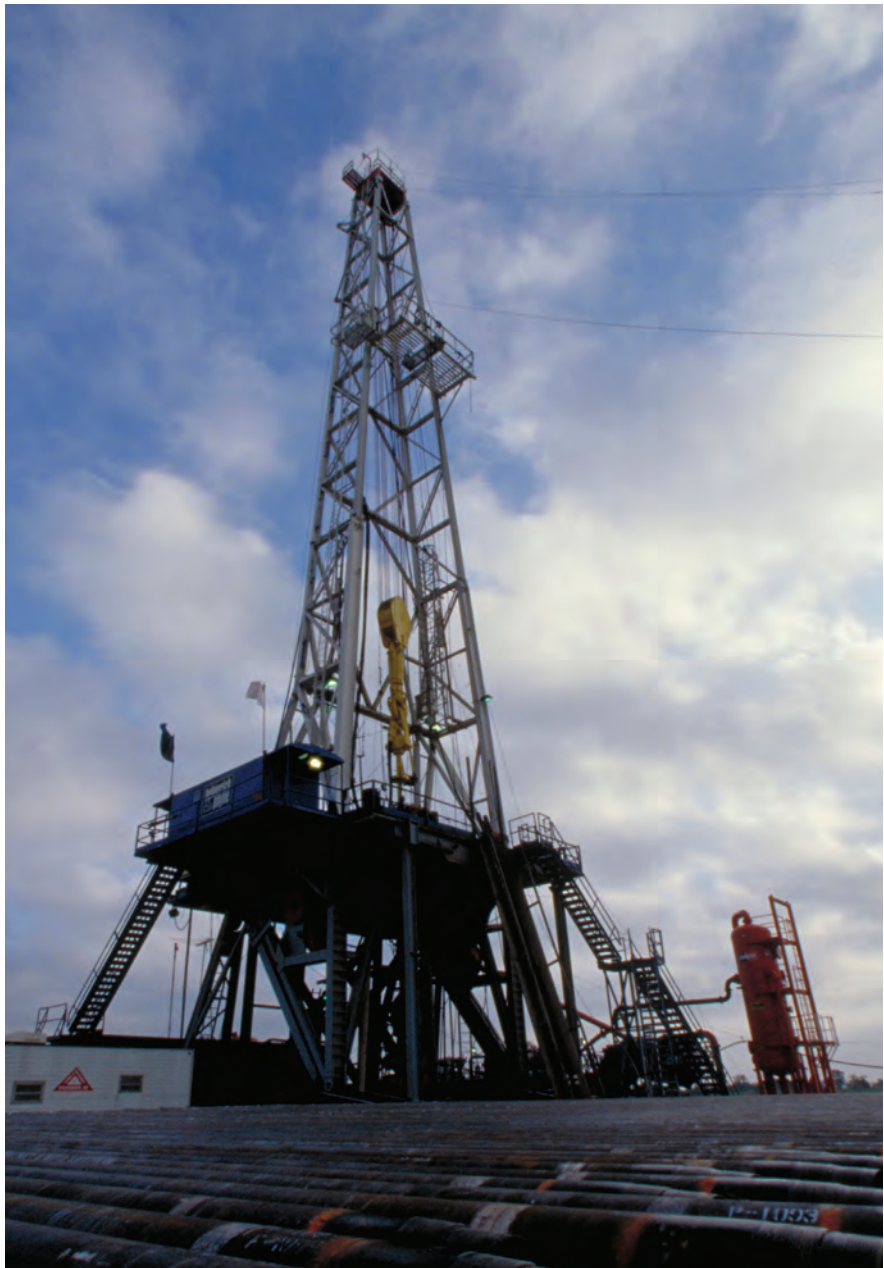
Nigeria is the leading oil exporter in Africa and also has the largest natural gas reserves on the continent, while Angola is the continent's second-largest oil producer. Neither can currently take full advantage of their resource reserves due to insufficient infrastructure for the extraction, processing and storage of these commodities. Africa is also exporting crude oil and re-importing refined products as a result of a lack of infrastructure, specifically refineries. The continent is giving away local beneficiation and profits, foreign exchange as well as the opportunity to skill up people.

Once extracted, insufficient pipelines result in the below-optimal levels of oil & gas commodities being transported for domestic use and export. The security of pipelines further impacts the functioning of the sector. Disruptions to Nigeria's oil and gas supply have been caused by local militants attacking oil infrastructure and damaging the pipelines. Oil theft, commonly referred to as 'bunkering', often causes loss of production and pollution. In 2013, pipeline vandalism in Nigeria increased by 58% to 3 505 cases and this accounted for a loss of an estimated US\$12 billion in petroleum products and US\$12 billion in crude oil losses.

Benefits from the region's gas reserves are realised not only through export revenue, but through the utilisation of a portion of these reserves in support of power generation through gas-fired power stations. Recent gas discoveries have fuelled the construction of gas-fired power plants to support the power sector, where there is a dire need for additional electricity generation. The introduction of more gas-fired power plants as well as harnessing geothermal sources will enable the power sector to diversify power generation away from being wholly reliant on hydropower in a region with vast hydrological variances.

Infrastructure project delivery is not without challenges. Half of the oil & gas respondents said that they had experienced delays of more than six months and budget overruns of between 10% and 50% over the past 12 months on their capital projects. Our respondents said that the greatest challenges they experience on their capital projects are political risk and government interference, access to funding, and the regulatory and policy environment of the sector. Other potential challenges include fraud, corruption, theft and a lack of skilled resources.

Looking specifically at project slowdowns and cost variances, these were attributed to internal problems such as weak planning and project management, poor governance and internal procurement issues. Economic factors, delays with government approvals, client decision-making, and finalising commercial agreements were additional factors contributing to these overruns.

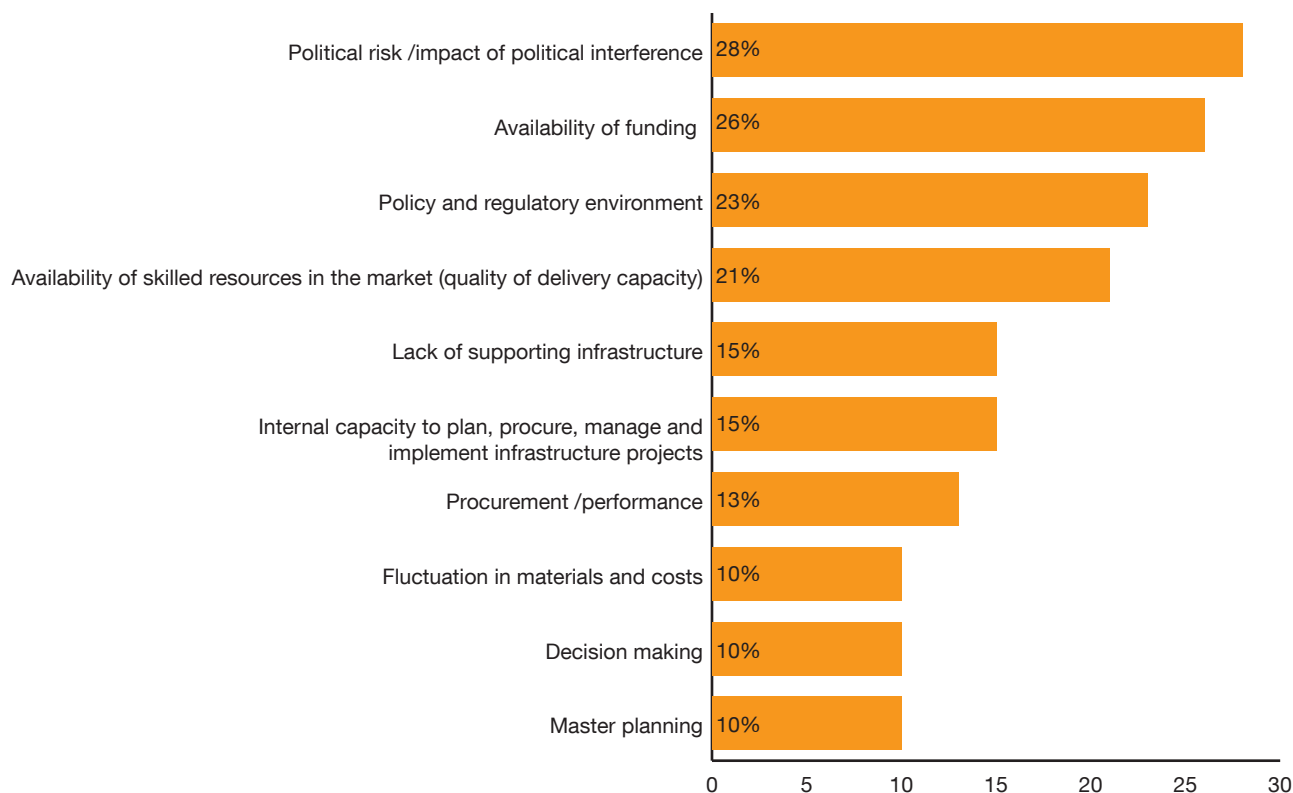


“Nigeria is the richest resource centre of the oil sector, but regulatory uncertainty, militant activity and oil theft in the Niger Delta are deterring investment and production, so much so that Angola is set to overtake Nigeria as the region’s largest producer of crude oil at least until the early 2020s.”

*– ‘Africa Energy Outlook, 2014’
International Energy Agency*

Figure 20: Oil & gas: Top three internal challenges relating to capital projects

Q: What are your top three current internal challenges in relation to capital projects that you are involved in? (Summary of top three challenges)



Base: 26 respondents operating in the oil & gas sector
Source: PwC analysis

The severe shortage of trained oil & gas workers in Africa is a serious hindrance for the industry. Governments are making localisation regulations and policies more stringent, requiring oil & gas companies to contract with local companies and hire local staff. Due to lack of local skills, the cost of employment for these oil & gas companies may increase as additional staff are hired as part of the skills transfer process.

Regulatory and policy issues such as uncertainty and delays in passing laws are impacting the growth of the oil & gas sector. For example, in Nigeria, the political and legal challenges surrounding the Petroleum Industry Bill (PIB) have created uncertainty among investors with respect to the future legal and fiscal environment. The country

estimates that about US\$28 billion worth of investment has been deferred between 2010 and early 2013, in anticipation of a new regulatory framework.

“Improved governance and transparency in the management of the oil and gas sectors reduce the risks facing investors, making African oil and gas developments more competitive with production from other sources.”

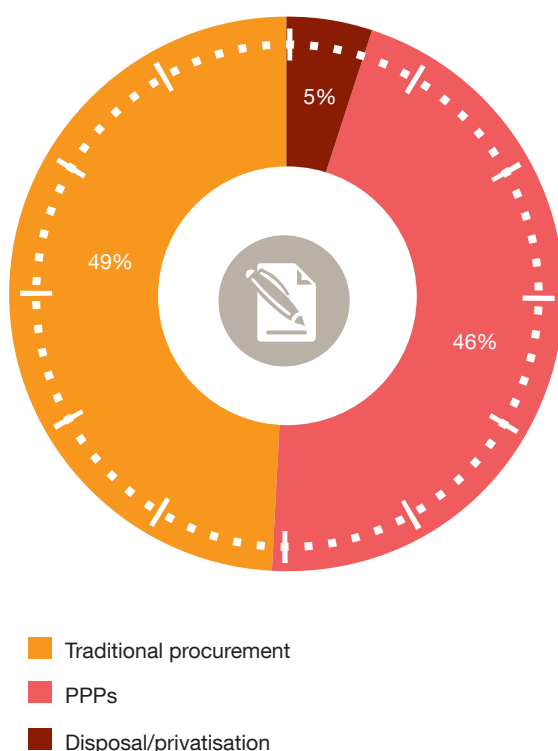
– ‘Africa Energy Outlook, 2014’
International Energy Agency

Financing for oil & gas developments comes from a number of sources. Oil, gas and mining companies are taking the 'build-your-own' approach, and providing their own funding in the absence of much infrastructure. As cited

in PwC's *Africa Oil & Gas Review 2014*, the biggest shift has been that companies are now financing their operations more through their own cash flow (from either their local or global operations).

Figure 21: Oil & gas: Funding infrastructure projects in the next 12 months

Q: Which of the following procurement models do you believe will be used more frequently in delivering your capital projects??



Base: 26 respondents operating in the oil & gas sector
Source: PwC analysis

Almost half of our respondents indicated that PPPs would be their preferred funding procurement model for upcoming projects, while the other half deferred back to the traditional funding procurement models.

PPP financing of oil & gas projects has been predominately between national oil companies (NOCs) and non-traditional oil & gas players (for example, oil & gas trading houses) who are willing to invest in the downstream industry of retail, marketing and refining. Over the last decade, NOCs have taken a greater stake in the downstream sectors as many international oil companies have divested due to low profit margins.

China is also providing essential financing for infrastructure projects in the sector. Most evident is activity in Angola, where infrastructure is being developed with support from Chinese investment as part of an 'infrastructure-for-oil' trade agreement.

In the DRC a contract has been signed between two Chinese state construction companies and the state copper company, which is worth more than the DRC's state budget.

"Africa, though increasingly taking on higher financing capacity on its own, still requires substantial external financial support to execute critical infrastructural projects."

– Survey respondent
Energy sector
West Africa

Sub-Saharan Africa has a wealth of natural resources and many of these remain untapped due to lack of infrastructure to access, process and transport these resources. With the advancement of the required infrastructure to support it, the oil & gas sector will see an increasing ability to meet rising consumer demand.

Power

Adequate, stable and cost-efficient power generation and transmission has been widely acknowledged as pivotal to the successful economic development of the sub-Saharan region. Yet the power sector remains one of sub-Saharan Africa's greatest infrastructure challenges, with limited electricity access and frequent power outages across the region. In the worst affected countries, the economic costs of power outages are estimated to run as high as 5% of GDP.

The combined power generation capacity of the 48 countries in sub-Saharan Africa is some 80 GW: roughly equivalent to the installed capacity in Spain. More than 50% of this capacity is located in South Africa. Access to electricity is unevenly distributed across the region, but on average, fewer than 30% of people living in the region have access to electricity, compared to more than 50% and 90% in South and East Asia respectively.

Electricity supply is frequently unreliable with ageing generation and transmission infrastructure failing to keep up with the growing demand for power. As a result there has been an increased reliance on self-generation and temporary solutions. Emergency generators now account for an estimated 750 megawatt (MW) of capacity in the region. This is despite an abundant availability of energy resources in the form of coal, oil, gas, hydropower and geothermal potential, all of which remain under-exploited as a result of low investment, a lack of institutional capacity and unclear regulatory frameworks.

Spending on electricity production and distribution in sub-Saharan African is expected to reach **US\$55 billion** in 2025

Extensive investment in power generation and distribution is essential if the region is to realise its economic potential. With recognition that the power shortage in sub-Saharan Africa is inhibiting economic growth, governments are taking increasingly active steps to support the sector. Spending on electricity production and distribution in the region is expected to more than triple from US\$15 billion in 2012 to US\$55 billion in 2025 and governments outside of Africa are supportive. The American "Power Africa" initiative launched by President Obama plans to provide US\$7 billion in funding to Africa over five years and additional finance is being provided by countries including China and, more recently, India and Japan.



"Many governments are now intensifying their efforts to tackle the numerous regulatory and political barriers that are holding back investment in domestic energy supply, but inadequate energy infrastructure risks putting a brake on urgently needed improvements in living standards."

– 'Africa Energy Outlook, 2014'
International Energy Agency

While investment in the power sector is forecast to increase across the region, the greatest spending will be concentrated in South Africa and Nigeria.

South Africa has made power generation a high priority in its National Development Plan, with spending projected to increase at an average annual rate of over 20% between now and 2025 to total more than US\$120 billion. In recent years South Africa has placed a focus on renewable energy as a means to quickly deliver electricity and reduce reliance on coal. The globally acclaimed Renewable Energy Independent Power Producer Programme (REIPPP) has already delivered more than US\$14 billion investment in the sector through a competitive process that has seen rapid falls in the cost of power from onshore wind and solar photovoltaic sources.

Across Africa the cost of fuel for back-up power was US\$ 1 billion in 2013

“Eskom is South Africa’s state-owned monopoly power company. It generates about 95% of all electricity consumed in South Africa. Not only does South Africa rely on Eskom for all of its electricity, but so do a number of its neighbours. The company states that 45% of all electricity used in Southern Africa is generated by Eskom. Botswana, Namibia and Mozambique all depend upon imports from Eskom to meet electricity demand. Coal is the predominant source of electricity generation, accounting for 90% of supply. Other sources are nuclear and hydropower, but increasingly solar and wind power are under development.”

*– Business Monitor International (BMI)
‘South Africa Infrastructure Report’, Q1 2014*

In Nigeria, spending across the electricity sector is expected to grow at an average annual rate of more than 10%, underpinned by solid government revenue growth from oil receipts. Following an ambitious process of privatisation and reform, spending on power generation and transmission is projected to total over US\$180 billion per annum over the next decade.

A large number of new power projects are under construction or in the pipeline across West Africa and these will help to ease shortages and meet growing demand.

By way of example, Angola is aiming to increase the country’s power production capacity from the current level of 1 800MW to 9 000MW by 2025 through the construction of 15 new power plants, while in Gabon, the government is focusing on the development of non-hydropower capacity to improve the reliability of supply.

Ghana plans to expand its thermal capacity through investment in gas-fired generation, although it has recently experienced disruptions to supplies through the West Africa Gas Pipeline and gas production from the country’s Jubilee field has been delayed.

In East Africa, BMI estimates that there is US\$17 billion worth of power plants under construction or in the pipeline with an estimated combined capacity of more than 7GW. The Great Rift Valley in Eastern Africa has the potential to generate 7,000 MW of geothermal electric power and to date about 400 MW has been exploited in Kenya while Ethiopia continues to expand its generation capacity from the same source.

A regional priority is to diversify away from reliance on a single source of power, as both Kenya and Tanzania have suffered from crippling electricity shortages owing to their over-reliance on hydropower. The major drought in the mid-2000s caused substantial economic losses, as high as 4% of GDP in Tanzania, and both countries were forced to import expensive fuel to fill the supply gap.

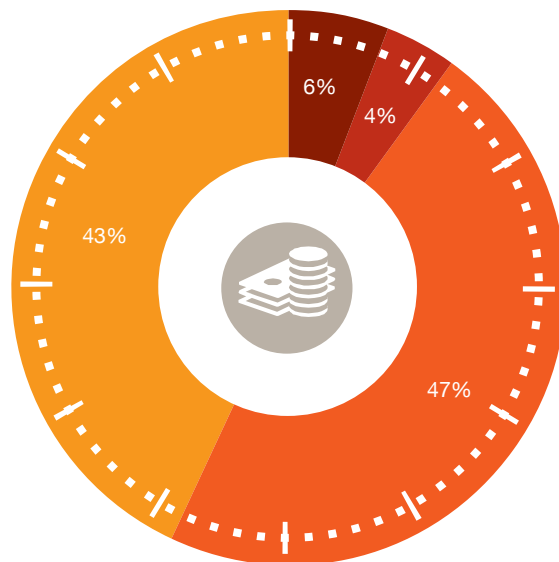
Kenya is investing in new gas, coal and geothermal capacity as well as in the exceptional wind resources of the northern Rift Valley. Tanzania is looking to expand its power system with investment in gas-fired,

hydropower and other renewable energy supported by a programme of sector reform. In Uganda, China International Water and Electric (CWE) has commenced construction of a 183MW hydropower plant as part of a bilateral agreement signed by Uganda and China in July 2013.

Notwithstanding the challenges in this sector, the results of our survey give grounds for optimism. Some 43% of the power sector respondents in our survey said they planned to increase their capital project spending by more than 25% over the next 12 months. Another 47% said their spending would rise marginally, with the remaining 10% expecting flat or declining expenditure. More than 40% of respondents in the sector said their capital project spending in fiscal year 2012 ranged between US\$100 million and US\$500 million and 31% said they had been involved with more than 20 projects in the last 12 months.

Figure 22: Power: Outlook on capital spending for the next 12 months

Q: What is your outlook for your capital project spend/funding for the next 12 months?



- Significant increase (> 25%)
- Marginal increase (<= 25%)
- Expenditure same as last financial year
- Significant decrease (> 25%)



31%

of respondents in the power sector have been involved with more than 20 projects in the last 12 months

Base: 47 respondents operating in the power sector
Source: PwC analysis

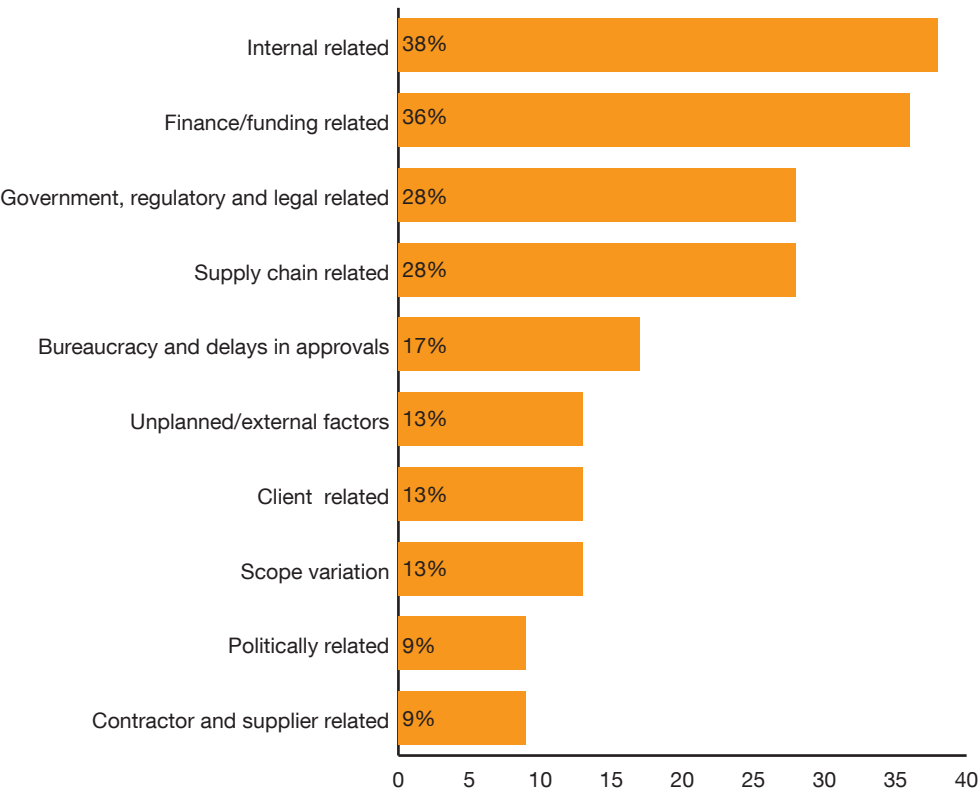
Nonetheless, barriers remain and a significant number of power sector respondents said they faced problems with projects over the past year. Some 42% said they experienced delays of more than six months, and 44% reported delays of one to six months. When asked what these time delays were attributed to, respondents said they were primarily due to internal problems such as inadequate pre-engineering, internal procurement issues, poor resource planning and weak project management, as well as financing issues including capital rationing and delays in releasing of funds.

Respondents cited project management problems, followed by economic factors such as inflation, currency fluctuations, exchange controls and delays in government approvals, client decision-making, or completion of commercial agreements as the most common causes of cost variances.

Nearly 40% of respondents said they had budget overruns of between 10% and 50%, while roughly one-third cited cost variances of less than 10%. Only 22% reported being on or under budget.

Figure 23: Power sector: Reasons for delays in completion of projects in the last 12 months

Q: What were the top three reasons for delays in completion of projects in the last 12 months?
(Summary of top three reasons)



Base: 47 respondents operating in the power sector
Source: PwC analysis

Power sector respondents said the greatest challenges to their capital projects include political risk or government interference, regulatory policy and processes, and the availability of funding. Internal capacity to plan and manage projects was also cited as a challenge. Respondents repeatedly said government simply cannot meet the growing demand for power infrastructure and that private investors

will need to fill the gap. When asked what the top three areas of focus and immediate improvement would be in the coming 12 months, our power sector respondents indicated that project feasibility and project scheduling (completion date forecasting and reliability of data in schedules) would be their top consideration, followed by improving performance of capital project delivery.

Budget overruns experienced by respondents in the last 12 months



39%

of power sector respondents experienced budget overruns of between 10%–50%



32%

of power sector respondents experienced budget overruns of less than 10%

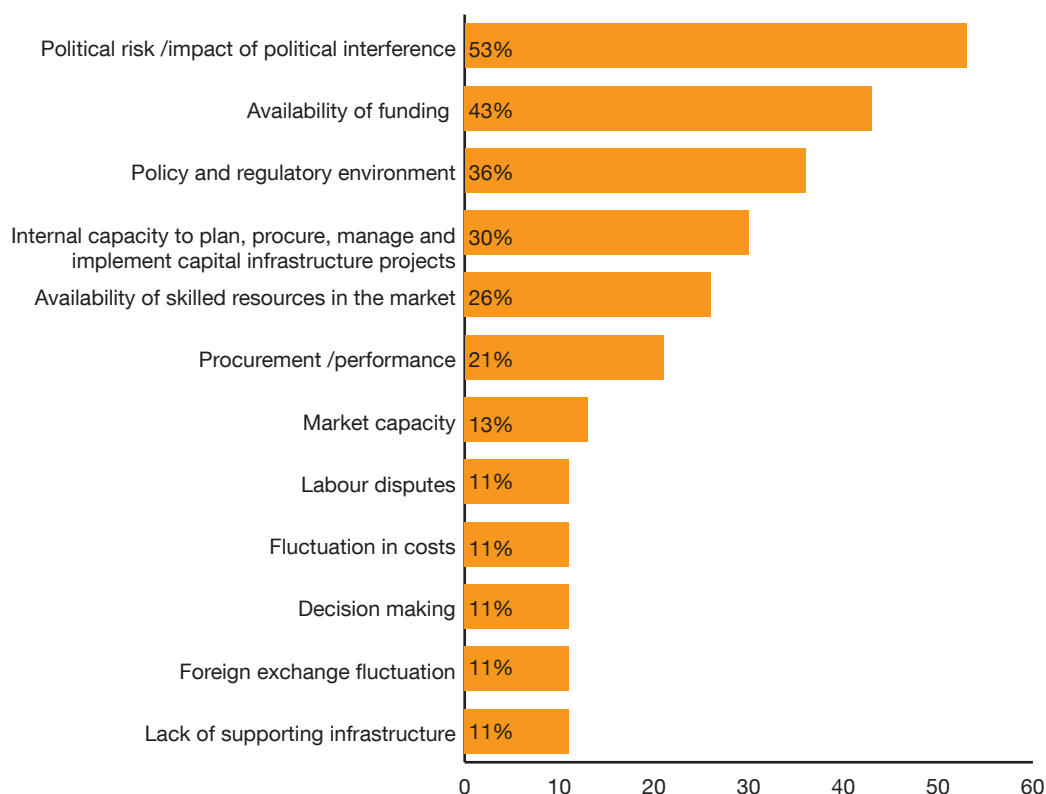


20%

of power sector respondents met budget

Figure 24: Power: Top three challenges experienced in the last 12 months

Q: What are your top three current internal challenges in relation to capital projects that you are involved in?
(Summary of top three challenges)



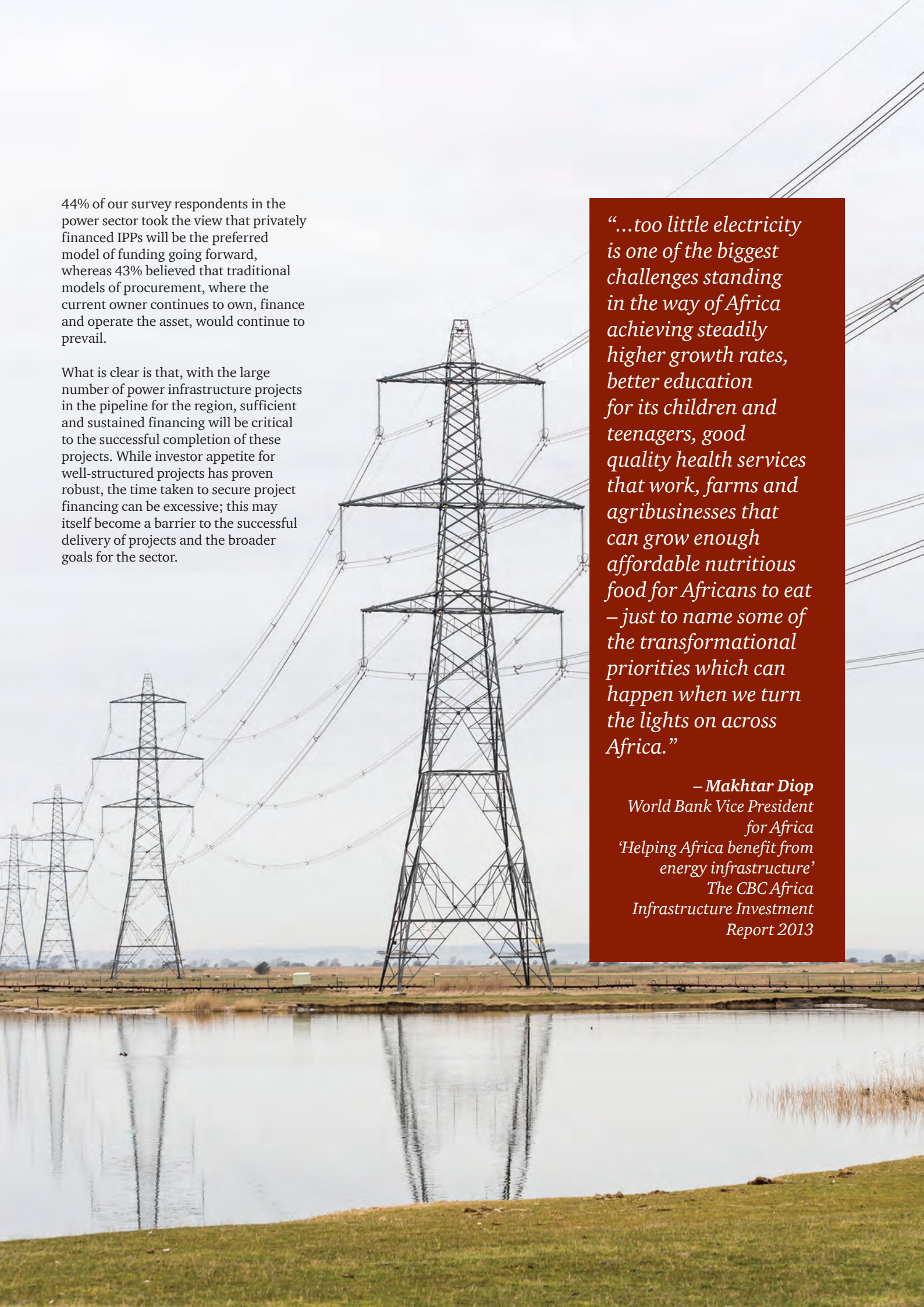
Base: 47 respondents operating in the power sector
Source: PwC analysis

According to a report from the World Bank and African Development Bank, one of the most cost-effective ways of expanding Africa's power generation portfolio may be through regional trade that pools the most attractive primary energy resources across national frontiers. They estimate that this could lead to annualised energy cost savings of around US\$2 billion per year.

The report also notes that "mobilising the necessary investments is difficult, given the fact that sub-Saharan Africa's power utilities are in a very weak financial condition, with an aggregate revenue shortfall estimated at US\$8 billion annually".

"Government is unable to fund projects to the tune required to meet the huge infrastructure gaps, but at the same time, the market for power is not fully developed as to be bankable and of acceptable risk for private sector financing."

– Survey respondent
Power sector
West Africa



44% of our survey respondents in the power sector took the view that privately financed IPPs will be the preferred model of funding going forward, whereas 43% believed that traditional models of procurement, where the current owner continues to own, finance and operate the asset, would continue to prevail.

What is clear is that, with the large number of power infrastructure projects in the pipeline for the region, sufficient and sustained financing will be critical to the successful completion of these projects. While investor appetite for well-structured projects has proven robust, the time taken to secure project financing can be excessive; this may itself become a barrier to the successful delivery of projects and the broader goals for the sector.

“...too little electricity is one of the biggest challenges standing in the way of Africa achieving steadily higher growth rates, better education for its children and teenagers, good quality health services that work, farms and agribusinesses that can grow enough affordable nutritious food for Africans to eat – just to name some of the transformational priorities which can happen when we turn the lights on across Africa.”

*– Makhtar Diop
World Bank Vice President
for Africa
‘Helping Africa benefit from
energy infrastructure’
The CBC Africa
Infrastructure Investment
Report 2013*

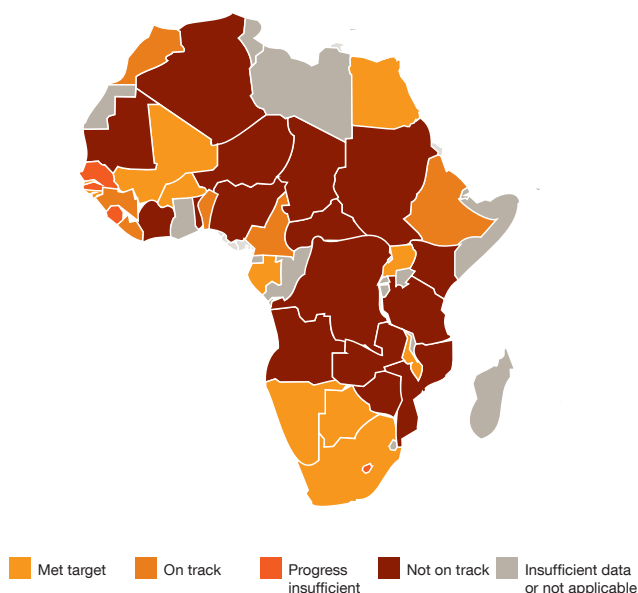
Water

The water sector in sub-Saharan Africa is plagued by under-investment in infrastructure and it manifests itself in service backlogs, ageing infrastructure, vulnerability to hydrological variances, and inability to facilitate food security and support economic growth. While these factors

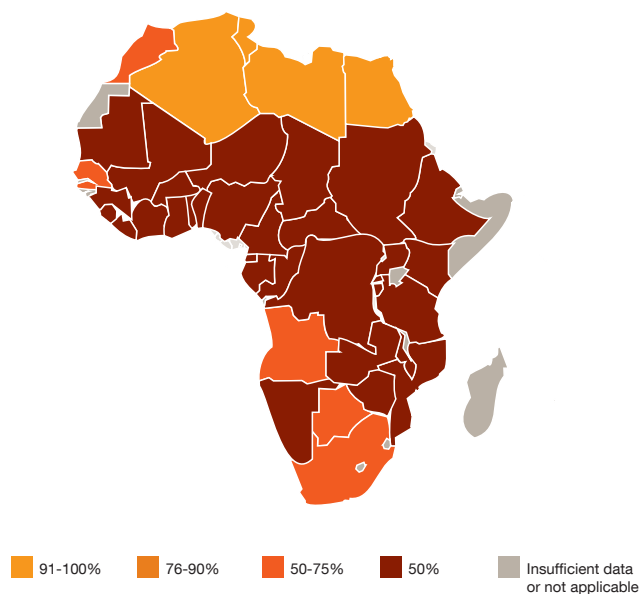
are all significant, the key driver for the water sector's infrastructure development in many African countries is the need to address the Millennium Development Goals (MDGs) with regard to access to drinking water and basic sanitation, as set out by the United Nations.

Progress towards achieving the MDGs has been slow. With deadlines looming, only five countries in Africa have met the targets so far and it is likely that only another 12 countries will do so by 2015.

Water supply and sanitation coverage in Africa, 2012



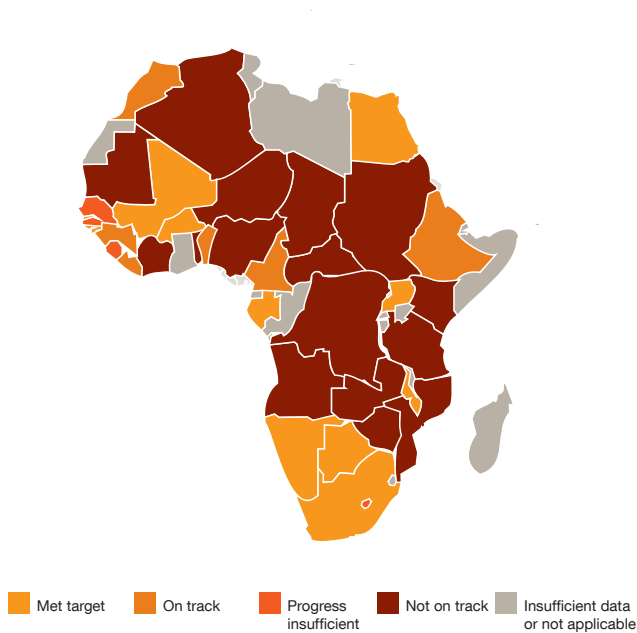
Proportion of population using improved sanitation, 2012



More than **40%** of rural households in Africa rely on unsafe surface water

There are still significant proportions of the population without access to basic water supply and dignified sanitation. More than 40% of rural households in Africa rely on unsafe surface water. Issues of inadequate funding, population growth and migration within and between countries make service delivery all the more difficult.

Water availability in Africa



Source: International Water Management Institute: Global Water Scarcity Map

It is estimated that US\$50 billion per year over the next 20 years, and a further US\$30 billion per annum for the 30 years thereafter will be required to meet Africa’s deficient water situation. Of this, US\$12 billion per year will be required to address the drinking water and sanitation targets.

Forty percent of the water industry respondents in our survey said they planned to increase their capital project spend by more than 25% over the next 12 months and over half said they planned a marginal increase in their spending.

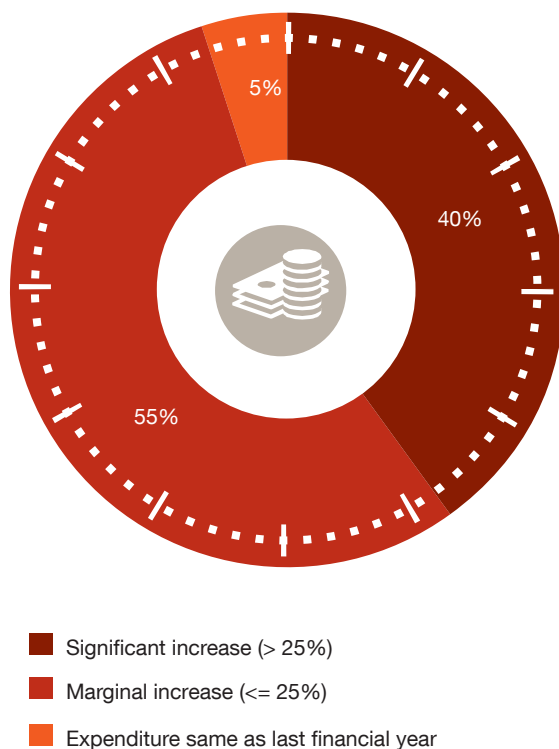
Nearly three quarters said they had spent between US\$100million and \$500million on capital expenditure in the last year. However, with such a large financial gap to meet the infrastructure deficits in the sector, funding remains a critical factor in the development of water infrastructure in the region.

Total capital spend/management of respondents in the water sector over the last 12 months



Figure 25: Water: Planned capital project spend in the coming 12 months

Q: What is your outlook for your capital project spend/funding for the next 12 months?



Base: 20 respondents operating in the water sector
Source: PwC analysis

As a result of limited funding, many countries are faced with trade-offs, of either maintaining existing infrastructure or expanding the network to the unserved. Such trade-offs often result in countries under-investing in the maintenance of existing infrastructure, which manifests in unreliable and poor quality of service and in operational inefficiencies. The development of overall asset management frameworks, strategies, plans and asset risk frameworks was cited as one of the main priorities for our water sector respondents, along with improving asset performance.

“...governments have limited funding and so we have to go to capital markets.”

*– Survey respondent
Water sector
Southern Africa*

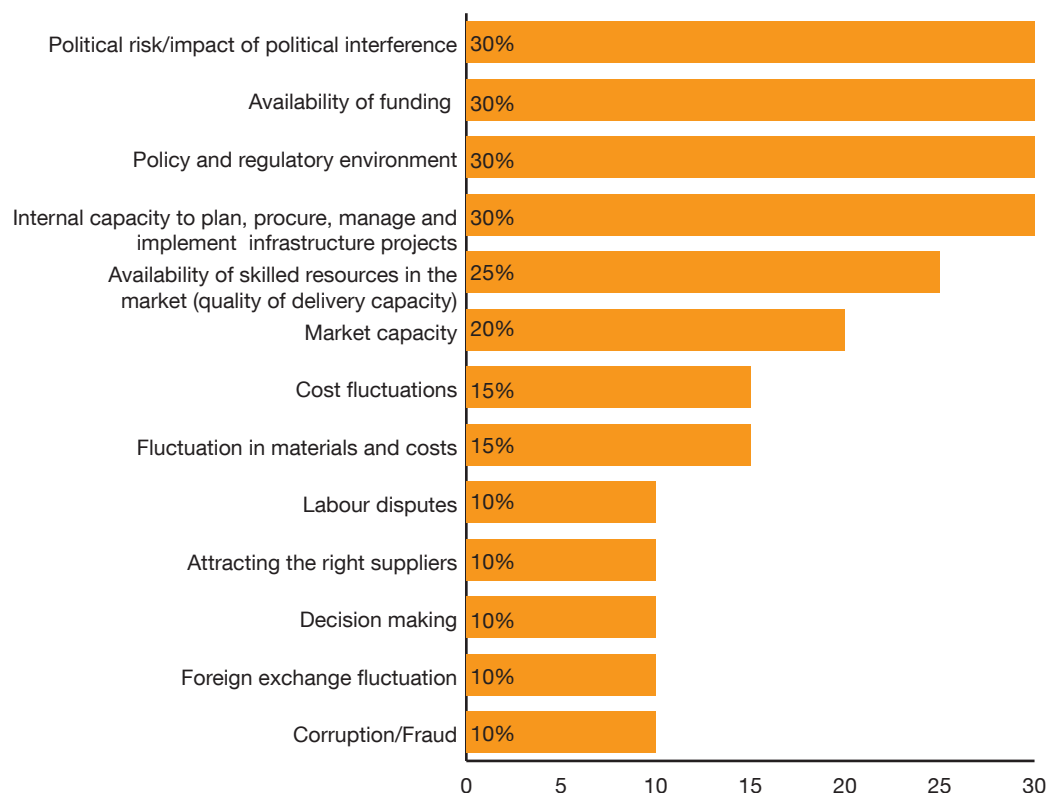
Levels of unaccounted-for water, a consequence of poorly maintained infrastructure, are extremely high in most African cities, ranging from 35%–50%. It is estimated that around US\$1billion is lost annually by water utilities in Africa as a result of inefficiencies in water networks. This loss impacts on the financial viability of institutions and on water security.

Strengthening economic and service regulation in most countries will be drivers for investment in the upgrade and refurbishment of water infrastructure. Policy and regulation was highlighted by water-sector respondents in our survey as one of the top challenges experienced in the last 12 months. Other significant challenges they experienced were political risk,

government interference and availability of funding. Consistently raised across all sectors and regions is organisations' lack of internal capacity to plan, procure, manage and implement capital infrastructure projects.

Figure 26: Water: Top three challenges experienced by respondents in the last 12 months

Q: What are your top three current internal challenges in relation to capital projects that you are involved in?
(Summary of top three challenges)



Base: 20 respondents operating in the water sector
Source: PwC analysis

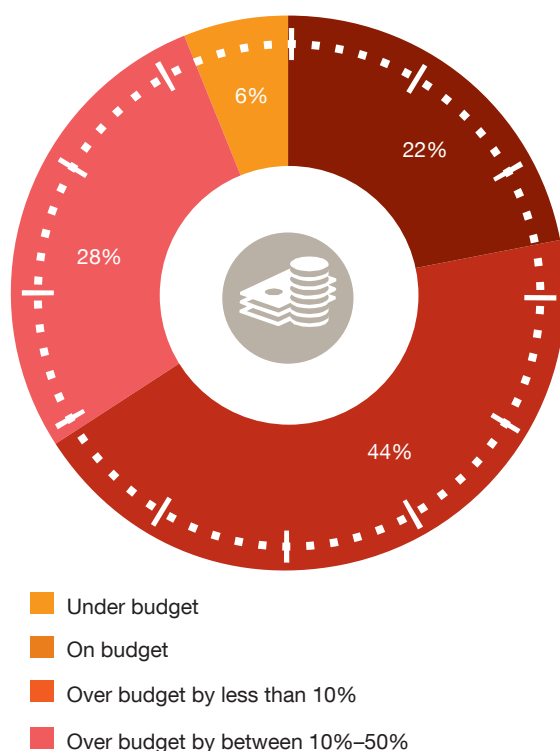
Weak project management, internal procurement issues, poor governance and poor planning resulted in delays in projects being delivered. Funding-related issues such as capital rationing and delays in releasing of funds also contributed to delays in project completions.

When it came to achieving project completions on budget, 44% of respondents experienced a cost variation of less than 10% from original budget and 22% experienced cost variances of between 10% and 50%. Insufficient project preparation, rushing to construction, inadequate

project management skills and delays in government approvals and client decision-making were cited as the primary causes of projects of the water respondents experiencing budget overruns and cost variances.

Figure 27: Water: Budget overruns and cost variances

Q: On average, in the past 12 months, to what extent have your capital projects experienced cost variances from the original business case?



Improved sanitation and safe drinking water are not the only factors driving investment – irrigated agriculture is becoming an increasing focus

Base 20 respondents operating in the water sector
Source: PwC analysis

Improved sanitation and safe drinking water are not the only factors driving investment in water infrastructure. Many African countries are looking at expanding irrigated agriculture to facilitate food security and to boost agriculture-based industry and exports. Food production in the region is almost entirely rain-fed, with irrigation playing a minor role. There are significant opportunities in East and West Africa to expand irrigated farming. Kenya, for example, is looking to increase its irrigated farming by one million hectares. Currently in sub-Saharan Africa the area under irrigation makes up just 4% of the total cultivated area, compared to 37% in Asia and 14% in Latin America.

Transboundary agreements are pivotal to effective water management in sub-Saharan Africa as many of the water basins cross multiple country borders.

Policies, regulation and agreements on the effective and sustainable management of these resources are crucial for optimum use of water and to ensure tensions do not escalate between countries over water usage rights.

There are already a number of large-scale transnational water schemes in development. One example is the Lesotho Highlands Water Project Phase II, where South Africa and Lesotho have signed a bilateral agreement for the development of the scheme. The US\$1.5 billion project will augment water supply to the Vaal catchment, which serves the economic heartland of Gauteng in South Africa by transferring a further 465 million m³ of water per annum from the Senqua River to the Vaal River to meet long-term water demand. Another example is the development and implementation of integrated water resources management (IWRM) master plans in West Africa,

which were signed off in 2007, targeting seven countries in West Africa with the aim to develop IWRM road maps towards building sustainable water infrastructure across the region.

Water is a central element in the water, energy and food nexus. As Africa's electrification and oil & gas programmes are rolled out, there will be a greater need to advance water infrastructure to support these developments. It is estimated that only 7% of Africa's hydropower potential is being exploited.

“Ghana has rehabilitated its infrastructure, expanding and building new elements to meet current and growing demand with funding from government and development partners. Demand includes urban water supply, rural and small towns' water supply, irrigation and hydropower infrastructure. These investments are enhancing access to urban, rural and small town water supply and improving irrigation facilities for more than 2 400 peasant farmers. Hydropower production has been made more efficient.

Mozambique has given high priority to water-related infrastructure development. The government is financing large schemes for rainwater harvesting, including excavated reservoirs in Gaza Province, the driest area of the country, to minimize the severity of droughts. Moreover, funds are being mobilized for 20 small dams to minimize the severity of droughts Benin has made good progress in drinking water supply. Many boreholes, hand-dug wells and piped systems were built for rural and small towns' water supply, and as a result the average coverage of drinking water in rural areas increased from 39 per cent in 2004 to 57 per cent in 2010.”

*– Assessing progress in Africa
towards achieving the Millennium Development Goals
MDG Report, 2013*



The Grand Ethiopian Renaissance Dam Project in Ethiopia is planned for completion in 2017 and will benefit Ethiopia, Egypt and Sudan. The primary aim of the dam is the generation of power with an expected capacity of 6 000bMW – electricity generation of more than triple Ethiopia’s current capacity – but additional benefits will include improved irrigation as well as serving as a bridge across the Blue Nile.

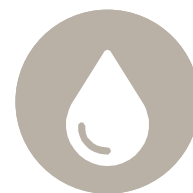
Egypt has long held the majority rights to the Nile and relies almost entirely on it for its water supply. The construction of the dam has created tensions between Ethiopia and Egypt, almost resulting in conflict. Under the new Egyptian government, relationships over the matter appear to be moving to a level of mutual agreement. The biggest obstacle to Ethiopia completing this project is not conflict or resistance but funding.

An essential part of water management is water storage

The Water Diagnostic Study of the SADC region suggests that the region only retains 14% of available renewable water resources, of which 10% is held in the Kariba and Cahora lakes on the Zambezi River. The rest of the available renewable resource flows to the sea. Construction of dams and the associated water pipelines require a substantial amount of preplanning, engineering and funding, and need to be factored into the infrastructure planning in the water sector which organisations and governments should undertake.

In 2012, the UN projected that by 2050, the total population size of sub-Saharan Africa will be 2 billion and 55% of this population will live in urban areas (1.1 billion). Growing industrialisation, urbanisation and agricultural production will continue to place strain on urban water and sanitation infrastructure.

Simultaneously, the requirement to provide access to safe water and sanitation to those in rural areas will persist. Entities need to continue taking action to address infrastructure deficits through rehabilitation of the physical assets and reforms of regulation and policy that govern the sector. Addressing the immediate challenges is core; however, it is imperative to focus on the longer-term needs and sustainability of the water sector in light of our growing populations across sub-Saharan Africa.



“...growing pressure on water resources can lead to domestic unrest exacerbate existing inter-state tensions and even constitute a source of armed conflict.”

– Any Freitas

*‘Water as a stress factor in sub-Saharan Africa’
Brief No. 12, European Union Institute for Security Studies
February 2013*



Regional overviews

East Africa



“The most prominent risk faced in the development of infrastructure in East Africa is completion on time and within budget. Beyond financial close, and the challenges of the funding gaps, the delivery of projects requires new and robust cost control and project assurance management methods. Given the complexity and size of these investments, independent project assurance and control will become a critical success factor for completion.”

*– Kuria Muchiru
CP&I Consulting Leader, PwC Kenya*

“Financing infrastructure in East Africa will remain a challenge that can only be met by the inclusion of the private sector through various forms of PPP structures. It will require the adaptation of the traditional PPP model to meet local realities and the inclusion of local financing institutions in this process. There is a significant amount of pent-up demand for investment capital into East African infrastructure in the international markets. The key for governments is to provide the vehicles for investment so that this demand can be unlocked while providing a reasonable return on capital investments.”

*– Tibor Almassy
CP&I Deals Leader, PwC Kenya*

As with many references to large geographical areas, it is tempting to make the mistake of viewing East Africa as a single homogeneous region. On the contrary, the countries in the region have diverse histories, cultures, ethnicities, politics, religions and languages. The region has a fast-growing and rapidly urbanising population of approximately 264 million.

Economic growth in East Africa is predicted to remain relatively strong, above 6–7% to 2016, and perhaps even beyond. Ethiopia is considered the fastest-growing economy in Africa and most recently Kenya was noted as the fifth-largest economy in

sub-Saharan Africa behind Nigeria, South Africa, Angola and Sudan. Progress has been made in the region to achieve political stability and openness, which are both key requirements for financial investment and successful economic development.

The spread of per-capita GDP across the countries highlights the vast diversity of economies in the region. Sudan has the highest per-capita GDP (US\$1 753), with Burundi (US\$267) the lowest. The World Bank database cites Kenya's current per capita GDP as \$994. This compares to the global per-capita GDP average of US\$10 514.

Many countries in East Africa are seeing slow growth in their middle class because the majority of these countries' households are low-income houses; however, with increasing urbanisation of the region, the demand for goods and services is anticipated to grow, fuelling the region's economy.

A consistent theme across regions is the crucial need for interconnectivity to boost trade, economic growth and social upliftment

Economic communities and intergovernmental bodies are essential to make this happen.

With all the best intentions to integrate through regional economic communities such as COMESA and EAC, East Africa still has several challenges to overcome in order to achieve this. These include poor regional infrastructure, water scarcity, difficulty in managing shared water resources, emerging regulations and institutions, the diversity of economies across countries and most critically, various countries' differing attitudes towards regional integration.

East Africa has abundant natural resources, minerals (gold, diamonds, gemstones and, more recently, significant oil and gas finds), water basins, arable land and a host of natural attractions. Many of these are relatively untapped. In Tanzania, for example, 20% of land is cultivatable, but only a third of arable land in the country is being cultivated.

The recent discoveries of oil in Kenya and gas in Tanzania are further opportunities to fuel resource-based economic growth. However, one of the biggest constraints for East Africa is the lack of reliable, efficient and robust infrastructure to support these activities.

Infrastructure across East Africa varies by country, with some having better quality of infrastructure in place.

Tanzania's road infrastructure is sufficient for trade requirements, but the rail network requires considerable investment after a failed concession neglected the asset over many years. In Uganda, only 25% of the national roads are paved. Kenya is a regional leader in air transportation with Kenya Airways ranked among Africa's top three international carriers, with an extensive network across the continent and a safety record up to international standards.

By far the biggest infrastructure constraint in the region is energy production. East Africa currently has the lowest access to power of all African sub-regions, negatively impacting households, businesses and industries.

Ageing and deficient physical infrastructure, difficulties accessing funding, an immature regulatory environment and protracted procurement processes all place constraints on the energy sector.

Governments in the region acknowledge that there is a power crisis, and a number of power generation projects are in the pipeline for consideration and implementation.

Kenya is planning to add an additional 5 000MW of power over the next 10 years and considerable investment has been set aside to rehabilitate and increase both generation and transmission capacity. Even though hydropower presents higher levels of

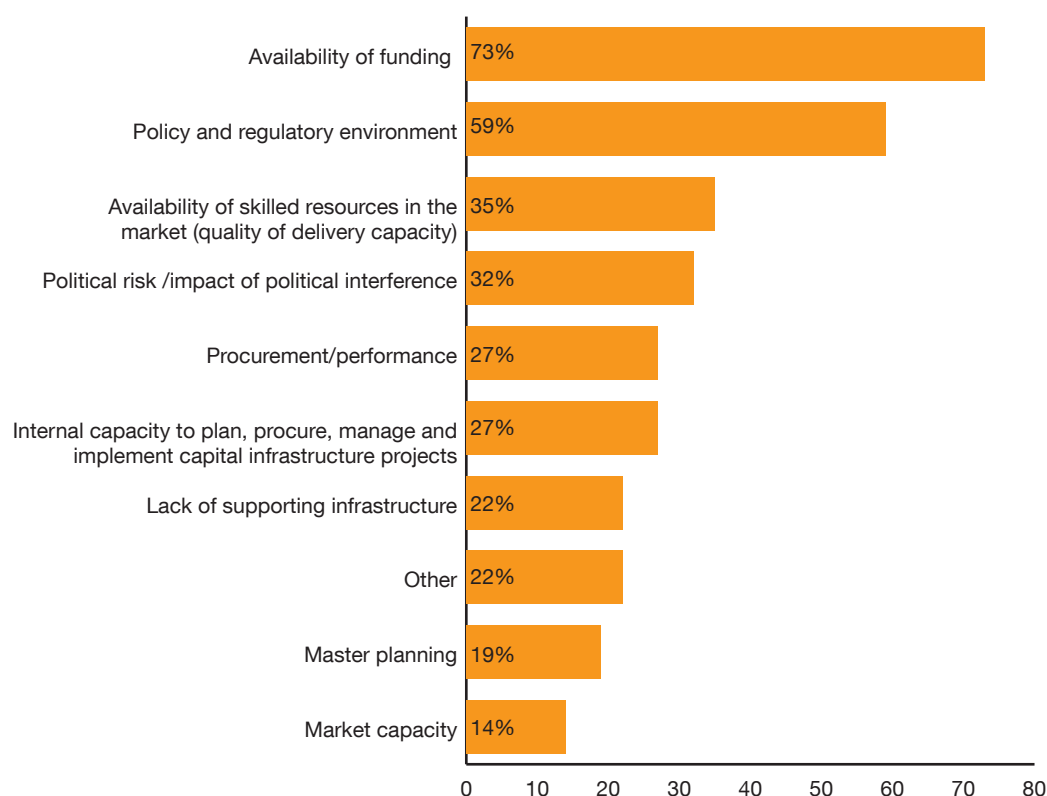
risk due to instability of supply, it is set to provide the bulk source of electricity generation, along with geothermal, gas, wind and coal.

There is considerable infrastructure development across other sectors too, at all stages of the infrastructure development life cycle, from pre-feasibility and financing to construction and hand-over.

The development in sub-Saharan Africa does not come without challenges and difficulties. When asked to highlight their main challenges in delivering capital projects, our survey respondents with operations in East Africa said that lack of funding was one of the top challenges, a sentiment already well shared across the region.

Figure 28: East Africa: Challenges in delivery of capital projects

Q: What are your top three current internal challenges in relation to the capital projects you are involved in?



Base: 37 respondents with operations in East Africa
Source: PwC analysis

The other significant challenges cited were the impact of political risk and governmental interference on project completion and the inhibiting regulatory and policy environment.

Delays at road borders due to lengthy and cumbersome customs processes, time-consuming roadblocks and inefficient weigh stations have negative impacts on the transport of commodities. This pushes up the end-buyer cost of commodities and makes reliability of supply impossible.

Regulatory reforms and institution building are key requirements to support the development of physical infrastructure. Countries in the region are making strides towards the necessary reforms. The future passing of the EAC's proposed One Stop Border Post Bill and the Vehicle Load Control Bill will improve the ease of movement of cargo, thereby reducing the cost of goods transportation.

Rwanda is in the process of liberalising its power industry to allow the private sector to participate actively in electric power production, transmission, distribution and trading, both within and outside the country. Uganda has been implementing power sector reforms since 1999, when the government dissolved the monopoly of the Uganda Electricity Board, attracting private investment and management to the sector.

Across East Africa, water frameworks, regulation and policies vary in content, completeness and effectiveness. Regulatory reforms need to include comprehensive transboundary water agreements and the management of shared water resources. In the African Great Lakes region, international mediation is required to help resolve Tanzania's longstanding border dispute with Malawi over rights to Lake Malawi. Recent disputes over the waters of the Nile Basin following the development of the Great Renaissance Dam in Ethiopia have also raised tension among countries along the Nile.

Kenya has reformed its water sector with the implementation of the Water Services Regulatory Board, Water Services Trust Fund, Water Appeal Board and seven water services boards.

In Tanzania, access to clean and safe water has fallen significantly since 2000. Water is crucial for food security through irrigation of crops and farming. The area under irrigation in the region could increase by 50% if the existing dams were more efficiently employed and managed.

However, lack of skills and expertise, both available in the market as well as internally to organisations, was raised as a concern by survey respondents and this is synonymous with concerns raised across numerous business sectors and organisations globally.



Funding

Funding for power projects in the region comes from a number of sources. China is playing a large role in investment and in June 2014 Japan's Prime Minister, Shinzo Abe, announced US\$32 billion in funding for Africa over five years. The World Bank's Multilateral Investment Guarantee Agency (MIGA) has also said it will guarantee investments in Kenya's power sector. The 'Power Africa' plan announced by the US Government in June 2013 will coordinate US\$7 billion in new and current funding over five years via numerous US Government agencies.

Until now the use of PPPs to fund projects in East Africa has not been as common as it is in West Africa.

In 2013, in Kenya, the Public Private Partnerships Act was enacted and this, along with the shortage of funding and capacity in the public sector, has seen an increase in the use of PPP structures to finance and develop projects, particular roads. In fact, the Kenyan Government's PPP unit is believed to have a pipeline of 58 potential PPP projects.

Other countries in the region have also undertaken PPPs as funding sources for their mega capital infrastructure projects. Tanzania has a formal Public-Private Partnerships Policy in place to support the use of PPPs in project development. In Uganda, the Kampala water management project is being funded by a PPP as is the waste-to-energy plant in Addis Ababa, Ethiopia. This waste-to-energy project involves the construction of a 50MW power plant that will use refuse accumulated at Repi, on the outskirts of Addis Ababa, as feedstock.

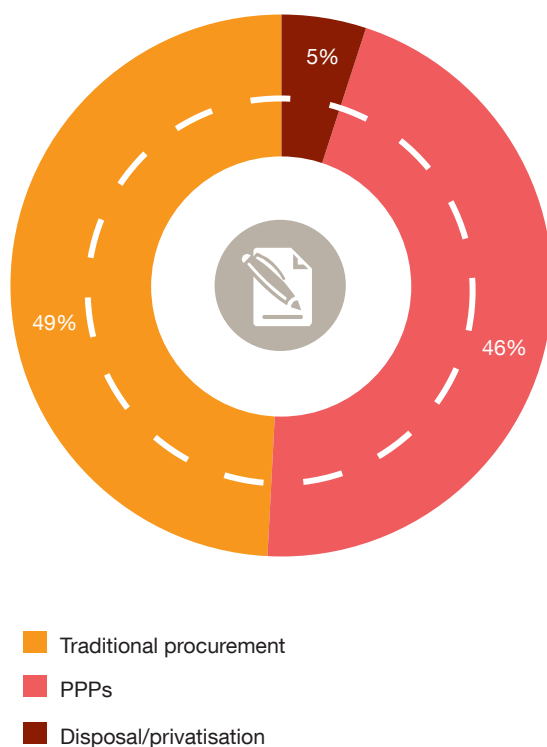
59% of survey respondents with operations in East Africa said they believed a mix of PPPs and governmental funding is critical to support the development of infrastructure projects going forward

"Capacities of governments in Africa are very limited. Private sector support is key."

*– Survey respondent
Multiple sectors, multiple
regions in sub-Saharan
Africa*

Figure 29: East Africa: Finance procurement methods

Q: Which of the following procurement models do you believe will be used more frequently in delivering your capital projects?



Base: 37 respondents with operations in East Africa
Source: PwC analysis

“Reduced capacity of government to support all projects means greater need for external funding.”

– **Survey respondent**
Mining sector
East Africa

The increased use of PPPs was confirmed by 59% of survey respondents with operations in East Africa who said they believed a mix of PPPs and governmental funding is critical to support the development of infrastructure projects going forward. Forty-six percent believe that PPPs are the procurement model to be used in delivering funding for these projects, while another 46% were still in favour of traditional procurement methods. Overall, there is an increased acknowledgement that alternate models are required.

East Africa is a region of diversity and complexity and great opportunity. The development of its infrastructure through various public and private initiatives will improve lives by providing access to economic opportunities, electricity, improved sanitation and potable water, reliable transportation and housing. There is much hard work to be done and many gains to be made.

Southern Africa



“The pool of available capital is limited and while every dollar invested in infrastructure can potentially have many-fold returns to governments, businesses and citizens, planned shareholder value and stakeholder benefits are rapidly eroded when delays and budgeted overruns occur due to poorly managed project implementations. Infrastructure projects require an intense focus on transparency and accountability to ensure that they are planned, funded and completed in a timely, cost-effective manner and are efficiently run. There is therefore a need to plan capital projects carefully to ensure that they return maximum value and benefits, while perfectly aligning with strategy.”

*– Mark Ally
CP&I Consulting Leader, PwC South Africa*

Vast regional differences exist within Southern Africa in the maturity and structure of its economies, the extent and condition of its infrastructure and the diversity of cultures and languages, climate and typography. This diversity provides significant opportunities and challenges for the region's economic growth, development and integration.

With the exception of South Africa, countries in the region have achieved positive growth over the past three years and this trend is predicted to continue. Mozambique, Zambia and Angola registered the fastest growth rates in the last year, exceeding SADC's 7% growth rate target, while South Africa will have the slowest growth at around 1.5% in 2014.

The IMF estimates the population of the region to be 294 million in 2014 and the average per capita GDP ranges from US\$9 210 per person in Mauritius to US\$226 per person in Malawi, reflecting the vast disparities between the different economies.

With the rising population size and economic growth has come an increase in the number of middle-class households. An estimated 15 million middle-class households in 11 of sub-Saharan Africa's top economies (Angola, Ethiopia, Ghana, Kenya, Mozambique, Nigeria, South Sudan, Sudan, Tanzania, Uganda and Zambia) is the key driver for the increased demand for goods and services which the region has been experiencing.

The region's wealth of natural resources, increasing consumer demand, demographic shifts, urbanisation and both regional and international trade are the main drivers of development.

Despite its slow growth, South Africa remains the economic powerhouse of the region with the most sophisticated infrastructure, state-owned entities (power and transport), financial

services, telecommunications, regulation and greater industrial and sector capacity. The South African Government and businesses will continue to play a major role in the development of the region.

Robust and effective infrastructure is vital to this regional integration and trade growth. At a regional level, infrastructure within Southern Africa is relatively developed compared to many other African countries, but there are variations in standards and quality between countries.

Transport infrastructure in South Africa is the most developed in Africa and was ranked 23rd of 155 countries in the 2012 Logistic Performance Index. Elsewhere, however, infrastructure deficits are vast. Angola has just 4km of roads per 100km² of land area, while access to electricity in Zambia is only 20%, less than half the African average, with much of that power going to the mining sector, limiting domestic consumption. The Port of Luanda in Angola is known for lengthy delays and capacity constraints with a general cargo vessel pre-berth waiting time of 144 hours (sub-Saharan African average is about 18 hours).

As with East and West Africa, the two most critical infrastructure deficiencies across the region are:

- Insufficient power to meet increased demands at an industrial, business and domestic level; and
- Inadequate, costly and unpredictable transport and logistics, which impacts the competitiveness of the region.

There is a vast amount of infrastructure development activity being undertaken across the region with commitment from funders, agencies and governments to close the infrastructure deficit.

While the economies of the Southern African countries continue to improve, regional integration, interconnectivity and cross-border cooperation remain key challenges to enhancing trade, economic development and poverty reduction

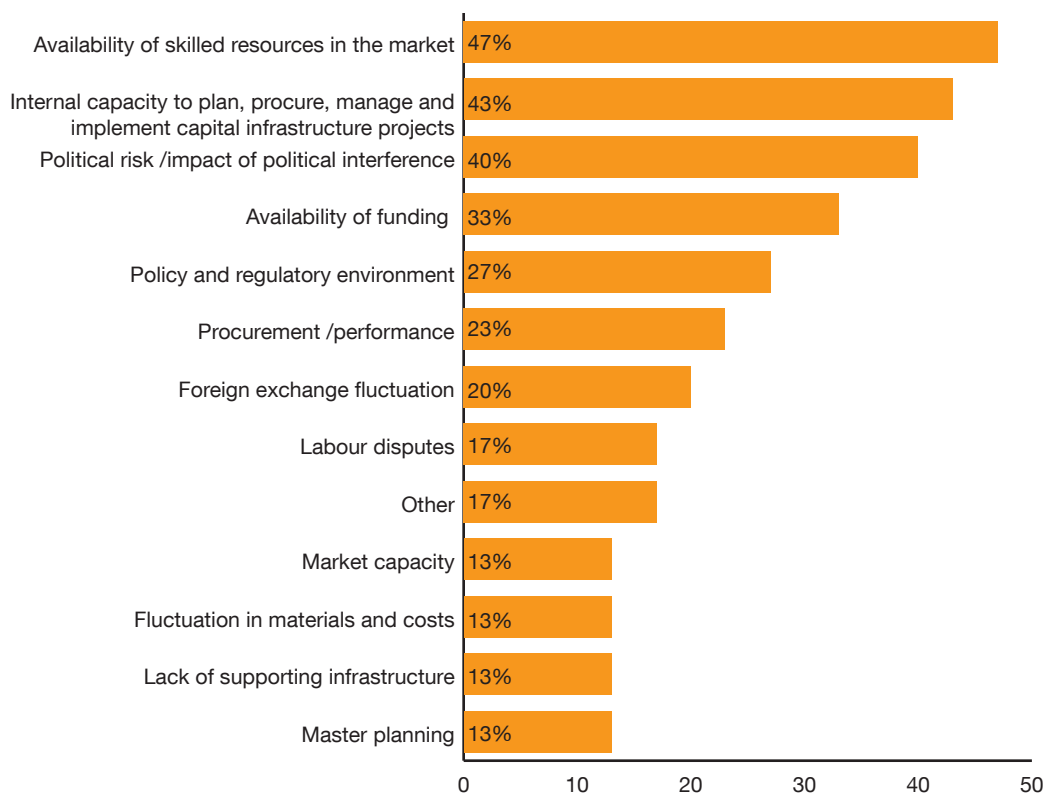
Respondents to our survey that have operations in Southern Africa said that their most pressing challenges in delivering projects are the availability of skills and a lack of internal capacity among state organisations to plan, procure, manage and implement capital infrastructure projects.

The third most highlighted challenge is the impact of political risk and interference. With a number of concessions having been cancelled by governments in the region, an improvement in transparency, regulation and procurement is needed to help restore the confidence of foreign investors in partnership models.



Figure 30: Southern Africa: Internal challenges in the delivery of capital projects

Q: What are your top three current internal challenges in relation to capital projects that you are involved in?



Base: 30 respondents with operations in Southern Africa

Source: PwC analysis

The skills challenge is a global issue – 65% of infrastructure companies who participated in PwC’s 17th Annual Global CEO survey, 2014 identified that creating a skilled workforce is a key priority. The majority of infrastructure CEOs believe they will need to change their talent strategies to capitalise on transformative global trends like demographic changes and urbanisation.

“Raw material prices and workforce worries are looming. More sector CEOs (76% vs. just 55% of CEOs overall) are concerned about high and volatile raw material prices. And the workforce is a matter of some concern too. Nearly one-third of sector CEOs are extremely concerned about access to key skills. And 70% worry about rising labour costs in high growth markets.”

*– Findings for the construction and engineering sector
17th Annual Global CEO Survey, PwC, 2014*



Funding

Financing and funds were also raised as a concern, but not the most limiting factor, with 40% of respondents indicating that funding for projects would be raised through a mix of private sector and government funding. The remaining 60% believe the traditional model of procurement (in which the current owner continues to own, finance and operate) would continue as the dominant model.

In South Africa, there are ambitious state-led infrastructure development plans. These are mainly led by the state-owned companies Transnet, Prasa (Passenger Rail Agency of South Africa), Eskom and SANRAL (South African National Roads Agency Limited). Traditional state-backed financing of these plans may become more challenging as some of the mega projects overrun budgets, commodity demand and pricing remain weak and the state reaches prudence levels on borrowing and guarantees.

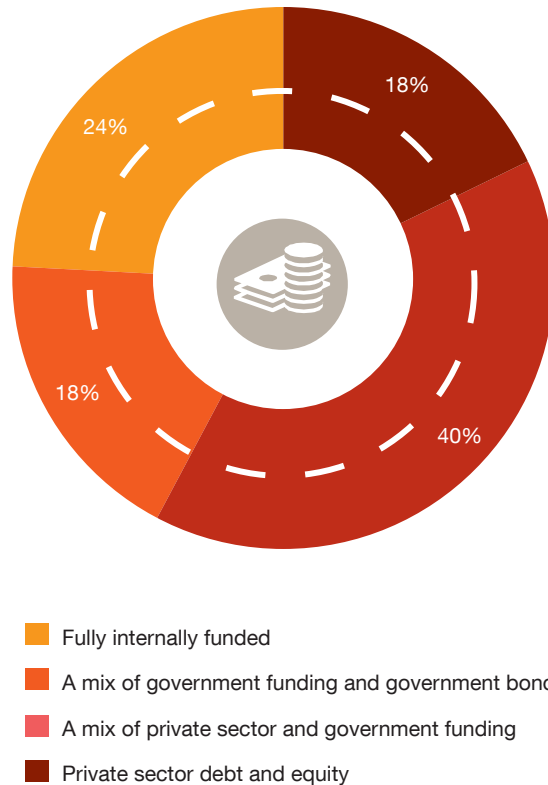
User-pays models and tariff increases are unpopular given high unemployment and slow economic growth. There has been fierce public resistance to SANRAL's Gauteng e-toll project and a widespread boycott of toll fee payments for this project. This has put SANRAL under intense pressure to repay the significant loan raised for improving the highways.

Other recent funding into Southern Africa has been provided by foreign direct investment (FDI) inflows, most specifically driven by the demand for oil, minerals and other natural resources. These inflows though are unevenly distributed, often following the larger resource-rich countries.

South Africa and Mozambique have recorded the highest FDI inflows at US\$6.4 billion and US\$4.7 billion respectively. However, this FDI inflow is slowly decreasing and most recently, Angola recorded a US\$1.7 billion disinvestment.

Figure 31: Southern Africa: Finance procurement methods

Q: How do you expect infrastructure capital projects to be funded over the next year?



Base: 30 respondents with operations in Southern Africa
Source: PwC analysis

As previously mentioned, China has undertaken numerous investments across sub-Saharan Africa to support its need for resources. The Chinese Development Bank has pledged to provide around US\$5 billion in open-ended financial assistance to Transnet to help implement its infrastructure upgrade plans and develop South Africa's cross-border connections.

In Mozambique, China has stepped in with negotiations to finance the construction of a deepwater port at Nacala. In Zimbabwe, China's Sino Hydro won a US\$1.3 billion contract in June 2014 to add 600MW of capacity to the coal-fired Hwange power station and the Namibian Port Authority has announced that it will sign a new US\$290 million agreement with China Harbour Engineering for

the construction of a new container terminal at the Port of Walvis Bay. These are just a few examples of China's deep involvement in funding infrastructure development in the region.

But China is not alone in investing in infrastructure as a way to secure access to resources. Japan, India and other Asian countries are joining in. India's ExIm Bank is pledging US\$217 million for infrastructure projects in Mozambique. Mozambique has also registered increased interest from Thai companies to invest, including in a new port.

Funding from local players is also increasing. One of the primary sources of finance on the continent is the African Development Bank (AfDB), with 30% of its portfolio comprising infrastructure projects. The AfDB is setting up the 'Africa 50' fund, which aims to leverage around US\$100 billion to finance infrastructure projects in Africa.

In an effort to move the country away from its current reliance on China for financing, Zambia's various state-owned infrastructure institutions are looking to capitalise on international demand for Zambian sovereign debt, following the Government's first Eurobond issue in September 2012.

Project-specific bonds are being championed by the AfDB while the World Bank's Multilateral Investment Guarantee Agency (MIGA) is providing political risk guarantees to debt financiers of infrastructure projects.

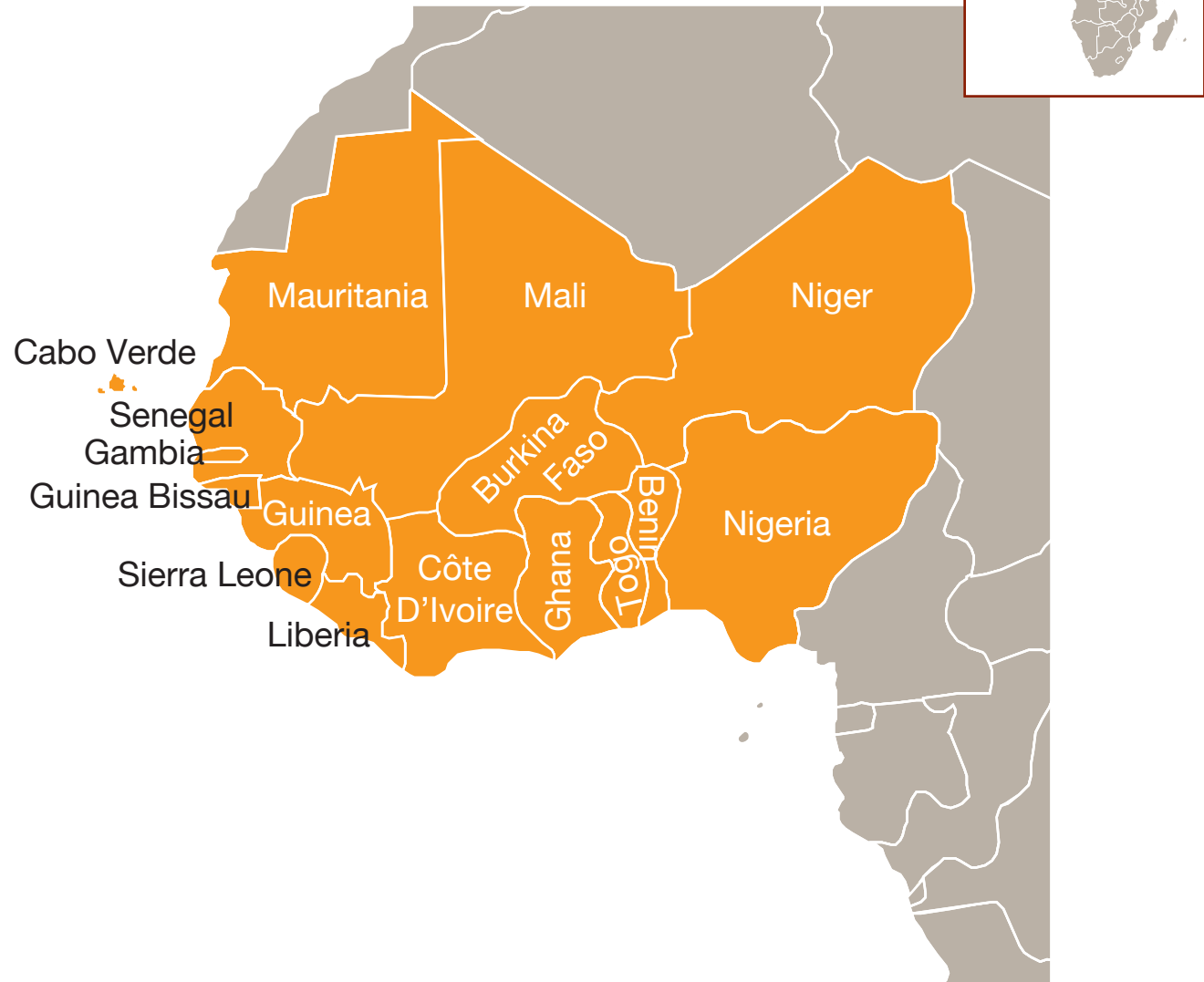
Stability, coupled with greater regional integration and cross-border cooperation, is essential for the successful economic development of Southern Africa. The region is on the path to continued growth but hard work and tough decisions lie ahead to ensure sustained development, reduced poverty and enhanced standards of living for its people, now and into the future.

"Throughout Southern Africa, this network of roads, railways, ports and airways meets the demand of most users, but more still needs to be done. As industries and economies develop throughout the region, use of transport network will exceed its capacity, hence we should not underestimate the projections indicated in the Regional Infrastructure Development Plan."

*– Dipuo Peters
South African Minister of Transport
'Leading Transport into the future'
Transport World Africa, 2014*



West Africa



“West Africa is one of the most attractive destinations for investors in infrastructure. The region’s growing population and its wealth of natural resources are the foundation for sustainable economic growth. It is clearly evident that sustaining West Africa’s impressive economic growth profile requires vast investment in enabling infrastructure. Improving governance, institutional reforms, trade, technology and an empowered workforce lend credibility to West Africa’s growth story.”

*– Ian Aruofor
CP&I Leader, PwC Nigeria*

West Africa comprises 15 countries stretching from Cape Verde in the west to Niger in the east. All countries in the region are members of the Economic Community of West African States (ECOWAS).

The region is increasingly being identified as an attractive destination for investors across all economic sectors. Its growing population of over 300 million, together with abundant mineral and natural resources, continues to drive steady economic growth, with an average annual growth rate of 6% over the past decade.

West Africa remains the fastest-growing sub-region on the continent and the AfDB is predicting that the region's growth is likely to accelerate to above 7% in 2014 and 2015, compared to predicted growth for the continent as a whole of 4.8% and 5.7% during the same years.

Until the recent Ebola outbreak, Sierra Leone was the fastest-developing country in the region, mainly driven by iron ore exports. In 2014, Nigeria's economy (GDP) became the largest in Africa, worth more than US\$500 billion, when the National Bureau of Statistics rebased the country's gross domestic product data. At the same time Nigeria overtook South Africa to become the world's 26th largest economy. By 2050, Nigeria is expected to move into the world's top 20 economies.

Statistics provided by the World Bank indicate the variation in per capita GDP across the region, ranging from US\$3 785 in Cabo Verde, followed by Nigeria with US\$3 006 through to the lowest per capita GDP of US\$413 in Niger. This is in comparison to the global average per capita GDP of US\$10 514.

Improved governance and political stability, institutional reforms, technology, declining trade barriers and an increasingly mobile workforce are among variables that continue to contribute to the pace of development.

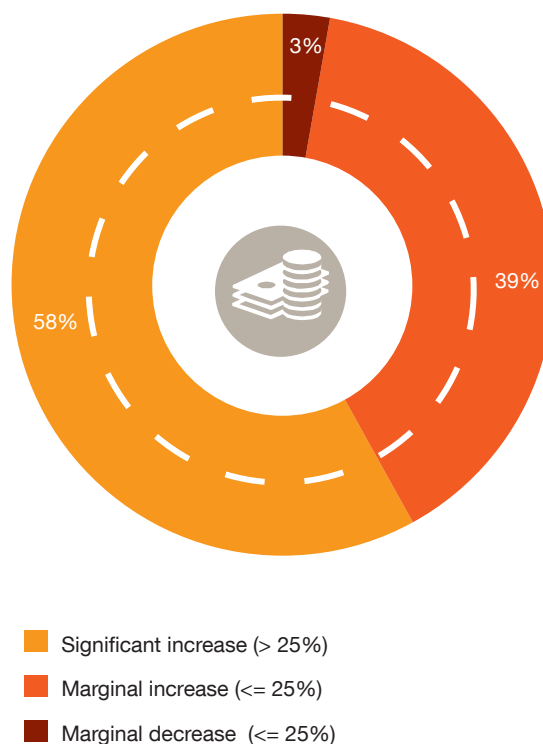
Against the backdrop of continuing economic growth, the need for enabling infrastructure is clearly evident. Although infrastructure requirements vary from country to country, the region as a whole can be characterised as suffering from a chronic infrastructure deficit.

The outlook for infrastructure spending in West Africa over the next decade is positive. This was echoed by the short-term outlook of survey respondents with operations in West Africa with more than half (58%) planning to increase their spending on infrastructure significantly and a further 39% planning to marginally increase their spend.

The region is increasingly being identified as an attractive destination

Figure 32: West Africa: Outlook on spending on capital projects

Q: What is your outlook for your capital project spend/funding for the next 12 months??



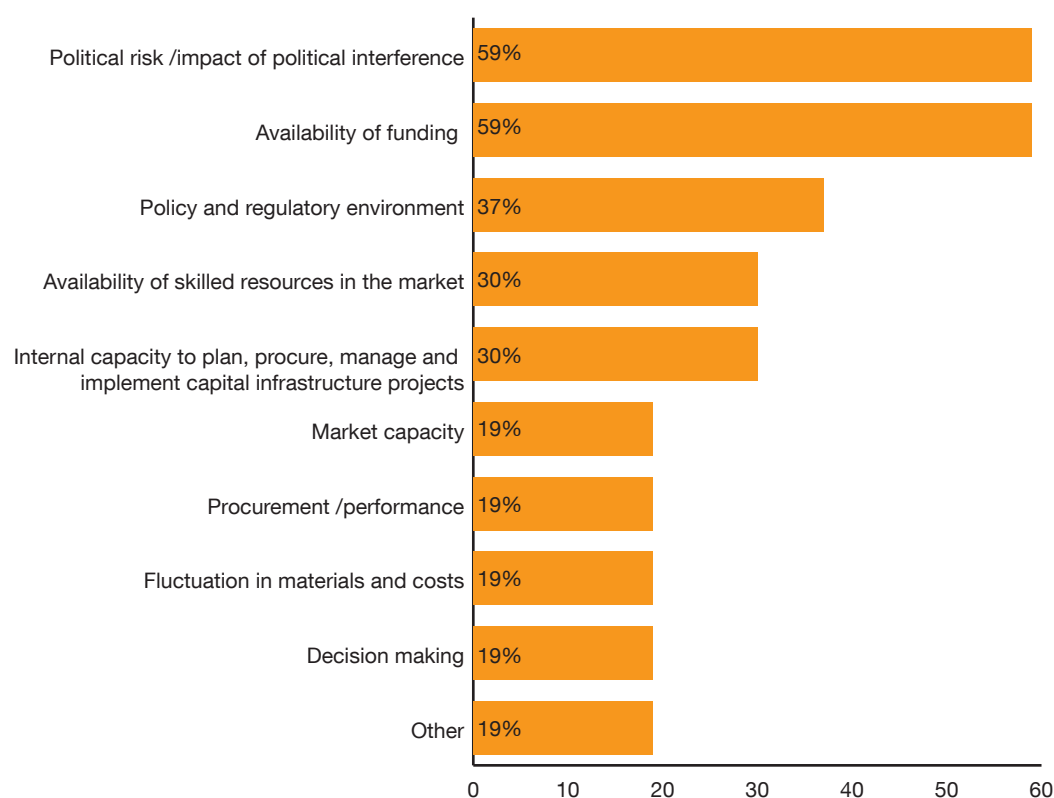
Base: 27 respondents with operations in West Africa
Source: PwC analysis

Respondents recognise numerous challenges in the execution of capital projects in the region. Among these, availability of funding, political risk and government interference were seen as the main challenges to delivering projects. Consistent with the observations of survey respondents with operations in East Africa and Southern Africa, the regulatory and policy environment was foremost on the list of challenges frequently encountered.

Energy is the focal area for West Africa as the region remains in the grip of a prolonged power crisis

Figure 33: West Africa: Challenges in delivery of capital projects

Q: What are your top three current internal challenges in relation to capital projects that you are involved in?



Base: 27 respondents with operations in West Africa
Source: PwC analysis

As with most of sub-Saharan Africa, energy is a focal area for investments in West Africa, as the region remains in the grip of a prolonged power crisis. Countries in the region have endured limited access to power for several decades, with persistent shortages in electricity supply despite the abundance of energy resources.

The challenges facing the power sector are very similar in countries across the region with huge unmet demand being hindered by power shortages, ageing transmission facilities, load shedding and shortages of feedstock.

“The lack of existing connections among West African national power grids is a great obstacle to increased electricity trading and to the resulting beneficial effects of grid-wide stability.”

‘Powering Africa’s Economies: Prospects for Growth in Electricity Markets’, Stratfor Global Intelligence

However, there has been steady growth in the power sector over the last five years, largely driven by legislative and regulatory reforms. In Nigeria, the recent unbundling and privatisation of the power industry is contributing to significant sector growth. These reforms have led to the majority stake sale/concessioning of six publicly owned generation companies and 11 distribution companies to the private sector. They have also driven the construction, completion and ongoing majority stake sale of 10 national integrated power plant projects, as well as the issuing of more than 70 licences to independent power producers.

There is a vast amount of infrastructure activity underway in multiple sectors across the region, both in the physical rehabilitation or construction of assets as well as reforms in the policy and regulatory environment

For example, the National Gas Policy has been adopted in Nigeria to encourage private sector involvement in the commercialisation of the country’s natural gas and to set up the gas infrastructure required to exploit the country’s natural resources. This has led to stringent regulation of gas flaring and the imposition of the Domestic Supply Obligation, which requires all producers of gas to set aside a certain percentage of their gas for strategic domestic projects.

However, the six-year delay to the enactment of the draft Petroleum Industry Bill (PIB) in Nigeria has created a level of uncertainty among investors regarding the future legal and fiscal environment. It is estimated that about US\$28 billion worth of investment was deferred between 2010 and early 2013, in anticipation of the new regulatory framework.

Transport infrastructure is a key consideration for investment in the region. Road transport is the predominant mode of transport and accounts for 80% of goods traffic in the region.

The road sector is characterised by weak institutional frameworks and human capacity gaps. Freight-sharing rules, queuing systems, third-country rules, cabotage, backhaul regulations, axle load limits, border crossings, roadblocks, checkpoints and transit agreements are some of the key policy and regulatory challenges facing the road sector in the region. Harsh weather, including frequent and severe flooding, result in road surfaces deteriorating easily and maintenance of roads is generally inadequate.

Coupled with this is the increase in traffic volumes on road networks. A study completed in 2008 showed that in Lagos, 57% of commuters and motorists spent 30–60 minutes on the road due to traffic congestion. With the increase in the city’s population since then, this situation has further deteriorated. Countries in the region are looking to more efficient means to transport people and consideration is being given across many to the construction of Bus Rapid Transport Systems (BRTs), Light Rail Transits (LRTs), subways and the like.

Rail infrastructure has been severely neglected over the years, with railway lines being outdated and disconnected, which makes regional rail integration difficult.

Although port efficiency and performance within the region remain well below international standards, the region’s ports have benefitted greatly from increased foreign investment following strong consumer demand and implementation of institutional reforms.

Terminal concessions now attract private investment on a scale unprecedented in the region. However, many West African countries maintain high port tariffs that discourage traffic and increase costs. Lengthy and difficult customs procedures result in long dwell times for import and export containers, impacting efficiency and cost competitiveness.

Piracy in the Gulf of Guinea remains a significant threat to investment and subsequent growth of the port sector within the region, which has seen considerable investment from Chinese firms in recent times.

Currently, only 10–15% of Africans travel by air, but growth within the region’s air transport sector is expected to continue given the current pace of economic growth and emergence of the middle class. The region’s aviation sector is characterised by a number of challenges, particularly inadequate infrastructure and safety concerns.

Air traffic control centres require major upgrades and there is limited connectivity to/from and within airports as well as a lack of transit facilities. The International Air Transport Association has identified lack of aviation expertise and skills as a major concern for the sector. Safety and security are key challenges. In 2011, the average number of air traffic accidents was nine times higher than the global average.

Expansion is required to accommodate the projected increase in freight traffic, especially transit traffic from landlocked countries, which is expected to increase by 10–14 times over the next 30 years.

Nigeria stands as the largest oil producer in West Africa and Africa. The US Energy Information Administration reports that West Africa has 37 billion barrels in proven oil & gas reserves, with a production capacity of 2.5 million barrels a day. The industry is dominated by the Nigerian market, which currently accounts for 95% of production capacity. Côte d'Ivoire and Ghana produce the remaining capacity.

The Nigerian oil & gas industry's major challenge is constant vandalism, which leads to annual losses of petroleum products worth millions of dollars. Without sufficient operational infrastructure the region will not be able to fully capitalise on the monetary gains offered by its large reserve of natural resources.

Although significant progress has been made towards increasing the number of people with access to safe water and sanitation there is still much to be done.

In rural regions of arid West African countries like Mali, Niger and Mauritania, less than 10% of the population have access to toilets

Much of the West African region has abundant rainfall and relatively low levels of withdrawals of water. Agriculture remains the largest user of water and the region's water resources present vast potential for energy production through hydropower.

Supply-side challenges relate to the multiplicity of transboundary water basins, high spatial and temporal rainfall variability, inadequate institutional and financing arrangements, inadequate data and depletion of water resources through human actions. Demand-side challenges include lack of access to

potable water and water supply for sanitation services, inefficiency and wastage in water use, as well as threats to environmental sustainability.

In order to tackle the region's water resource issues, integrated water resources management (IWRM) master plans targeting seven West African countries were developed and signed off in 2007. The IWRM project aims to provide assistance with the development of an IWRM road map towards building sustainable water infrastructure across the region.

Apart from basic infrastructure, West Africa is also seeing a heightened focus on investment and activity in the agricultural and healthcare sectors. There has been a renewed focus on agriculture as is evident in the policy and development agenda of national governments and international development agencies who have committed to expanding the agriculture sector while also aiming to provide food security and improved nutrition for the rural poor.

Agriculture currently contributes around 35% of West Africa's GDP and accounts for 65% of employment. The region has large areas of arable land, incorporating aquaculture and fruits and vegetables in addition to grains and livestock.

Significant growth in cocoa production is expected in Ghana with the government committed to supplying free inputs and improving infrastructure. Some of the major challenges in the agriculture sector are inadequate credit facilities, insufficient input supplies such as seeds and fertilisers, limited access to equipment and new technologies, increased competition with smuggled products, poor transport infrastructure and inadequate storage facilities.

The continued threat of disease and bad weather pose significant risks to cocoa and coffee production and smuggling of cocoa from Ghana into Côte d'Ivoire to take advantage of higher prices threatens to destabilise the Ghanaian cocoa industry.

Healthcare demand in West Africa is increasing given population growth and the emergence of a middle class that is willing to pay for health services. While the potential for future growth in the sector is considerable, there are still huge challenges related to inadequate government funding, health insurance schemes and frequent strike action among public health workers.

Improved healthcare facilities are increasingly being funded by international aid agencies, foreign and local investors, and banks. International healthcare equipment companies continue to seek partnership arrangements to support the development of healthcare facilities through different financing mechanisms such as leases and pay-per-use models for expensive laboratory or hospital equipment.





Funding

West Africa has been the most progressive region in sub-Saharan Africa in its move to PPPs as a source of funding for large mega infrastructure projects. Over half (51%) of the survey respondents with operations in West Africa indicated that their preferred procurement model for financing was PPPs and 78% believe that external private sector financing for capital projects is critical.

The use of PPPs to deliver road infrastructure is on the increase due to shortfalls in traditional public funding through budgetary allocations. Typical examples of this funding model are the US\$2 billion six-lane dual carriageway connecting Lagos and Abidjan via Cotonou, Lomé and Accra.

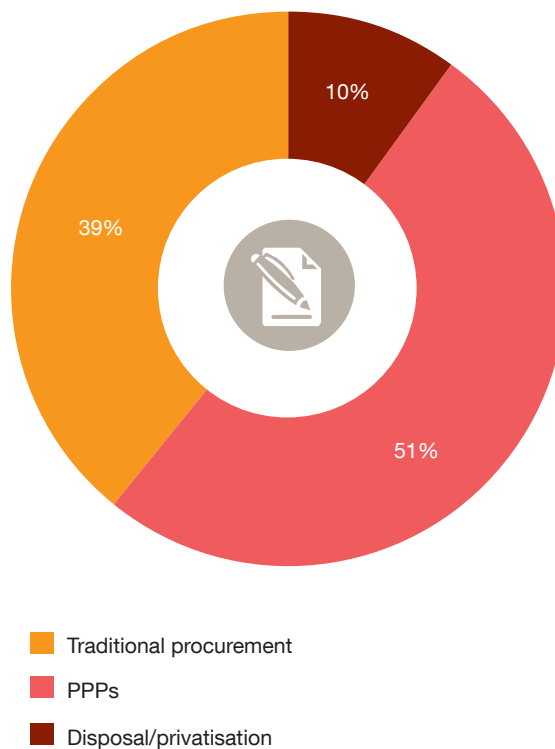
Chinese investment in the region's transport infrastructure has grown significantly. Chinese firms have become dominant players in the road sector with companies such as China Civil Engineering Construction Corporation (CCECC) establishing a significant presence in the market. CCECC has been awarded the US\$1.49 billion contract to build the Lagos-Ibadan railway and in Ghana, China has pledged to support the US\$6 billion Nsawam-Kumasi-Paga railway.

PPPs are increasingly being considered as a viable model for financing airport infrastructure. In Sierra Leone, the Government recently announced that the China Railway International Company will build a new US\$200 million international airport using a PPP with financing from China's Export-Import Bank.

West Africa remains the fastest-growing region on the continent and with an ever-increasing population and middle-income sector, as well as renewed interest from foreign businesses in sectors such as minerals, resources and mining, the demand for goods and

Figure 34: West Africa: Finance procurement methods

Q: Which of the following procurement models do you believe will be used more frequently in delivering your capital projects?



Base: 27 respondents with operations in West Africa

Source: PwC analysis

“Governments cannot deliver in mega projects and hence require private capital participation.”

*– Survey respondent
Operations across multiple sectors
West Africa*

services both locally and for export will continue to rise. The need for effective and robust infrastructure to underpin the economy to support meeting and capitalising on these demands is now more critical than ever to the success of the region.



Conclusion

Infrastructure plays a key role in economic growth and poverty reduction. Conversely, the lack of infrastructure affects productivity and raises production and transaction costs, which hinders growth by reducing the competitiveness of businesses and the ability of governments to pursue economic and social development policies. In Africa one of the most frequently cited barriers to entry and economic growth is physical infrastructure.

Those countries that have been most successful in developing and maintaining infrastructure have established programmes of prioritised investment opportunities with a number of features, including clear political support, a proper legal and regulatory structure, a procurement framework that can be understood by both procurers and bidders, and credible project timetables. These country programmes are more than just marketing – they eliminate key frictions such as long project lead times and unclear political risk, which directly impact the viability of the business case.

Some of the leading questions which owners, regulators, policymakers and funders need to be asking include:

- How can current infrastructure output, reliability, costs and revenue be optimised?
- How should programmes and projects be prioritised and sequenced to create the greatest impact on economic growth, social upliftment and sustainability?
- What risks does climate change pose to infrastructure and how can these be mitigated?

- What is the optimal role and procurement strategy for the private sector in state-led infrastructure programmes?
- Where will the money come from?
- How can the demand side be managed?
- How can international interest be attracted?
- How can local content be increased?
- How can project governance, oversight and control be improved to ensure projects are delivered on time and within quality and budget?

PwC is a key player in capital projects and infrastructure across the globe. Our PwC Africa Capital Projects & Infrastructure Advisory unit is part of a team of more than 9 000 in 34 African countries who work across all key sectors and countries on the continent. We have learned the lessons of mature and other developing markets, which can be leveraged in Africa to leapfrog linear and conventional infrastructure development paths. Through our deep industry and technical insights we are beginning to understand what works and what doesn't in developing infrastructure in Africa. Being independent of funders, engineers and contractors, lawyers, suppliers and operators, we build trust and work with our clients to solve complex infrastructure challenges free from conflicts of interest.

Through this survey and our interactions with key stakeholders in the sector, we have confirmed the tremendous possibilities that lie ahead. Expectations, optimism and willingness to embrace new ideas and partners are at a high point. We share this positive outlook and remain committed to unlocking these opportunities and the wealth of Africa for its people, through sound and sustainable infrastructure delivery and operation.



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