



**A shift to more but less**

Africa Construction  
Trends Report

2017

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# Preface

We are pleased to release the 2017 edition of the *Africa Construction Trends (ACT)* report. Once again, we look at the regions and sectors that have been the driving force for construction across this diverse continent.

It is interesting to note the vast regional differences regarding who funds and who builds. One common thread is the role of government as the largest owner of projects. Governments own between 57% and 90% of tracked projects per region, showing the importance of their role in providing critical infrastructure. This also shows that the strength of the private sector varies widely across regions. Governments remain the single largest developers of infrastructure projects with Transport and Energy & Power dominating. Real Estate follows as a close second or third in each region.

Yet, as covered in our 2016 issue of the ACT, countries are constrained by various external and internal factors affecting economic growth as well as infrastructure and capital projects (I&CP) activity. While 2016 looks to have marked the bottoming out of Africa's growth slowdown, economic expansion for sub-Saharan Africa's (SSA) growth is expected to lag global growth in 2017, but recover somewhat to 3.4% in 2018.

This continues to affect confidence, as well as available spend and budgets for infrastructure projects, as reflected by figures such as gross fixed capital formation as a share of GDP. East Africa continues to stand out; both as a growth region and as one focused on creating a more conducive environment through infrastructure investment – enabling investment and business.

One of the other trends is the increase in the number of smaller value projects, 193 of the 303 projects tracked fall within the US\$50m-US\$500m range. This could point to an unblocking of projects or a realisation that true megaprojects are slow to implement, complex to construct and to commission.

Research shows that nine out of 10 global megaprojects (projects with a value of at least US\$1bn) are either over budget or over time. This year's focus section is on *Keeping Projects on Budget and on Time – Managing Capital Project Decisions*. While overruns are not limited to megaprojects, the probability of a project experiencing time and cost overruns increases with project size and complexity.

We unpack some of the effects of these overruns on project implementation. Unfortunately, no country or region walks away unscathed; highlighting the importance of planning and preparation in the delivery of large infrastructure projects. We also offer some ideas as to how some of these problems can be overcome.

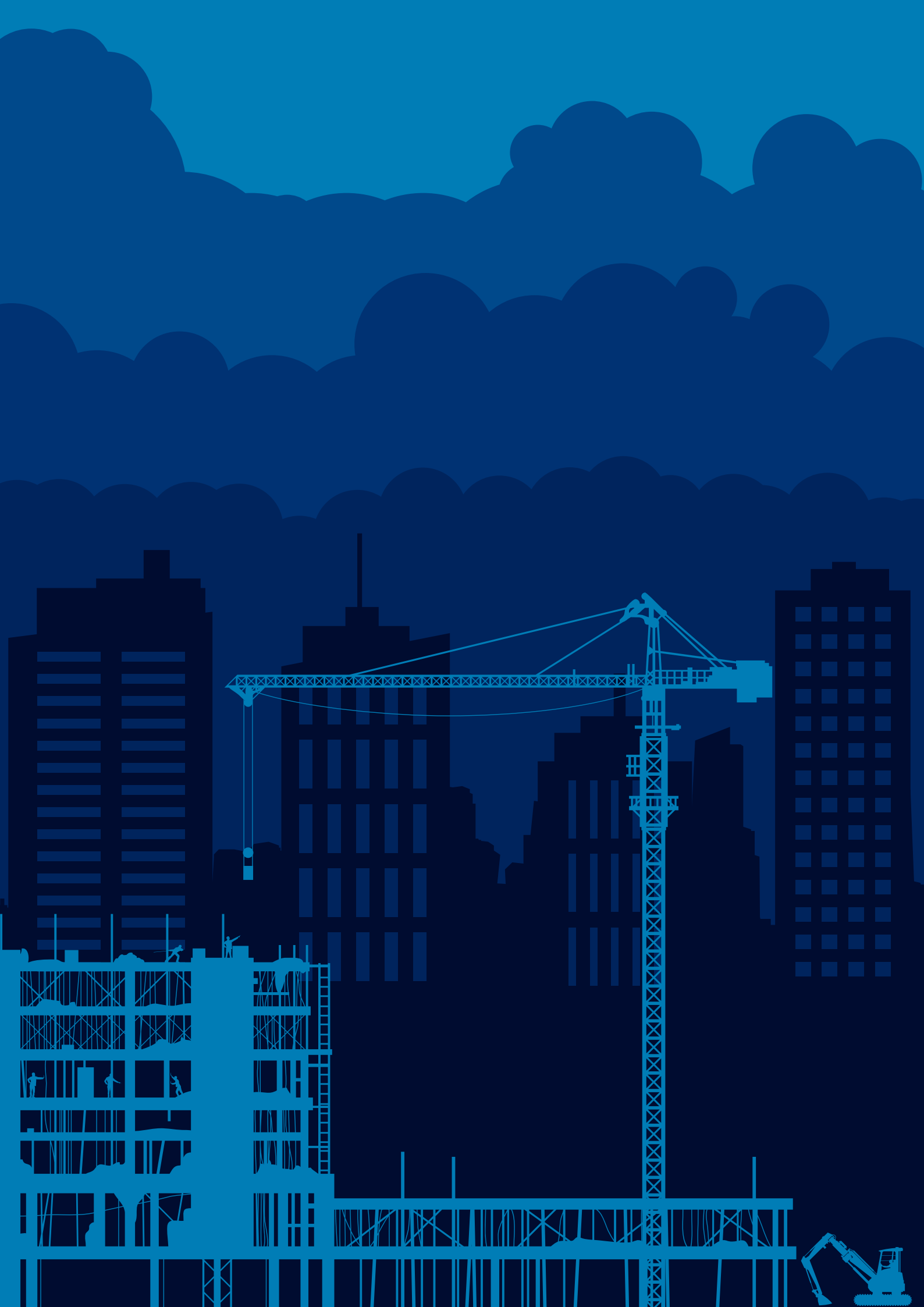
Deloitte teams have advised on many of the world's largest and most complex infrastructure and capital projects. Our teams advise clients across the lifecycle of an infrastructure asset and other large capital projects, so investors, project developers/sponsors and operators in both the public and private sectors can take every step with confidence.

The unprecedented magnitude of current African infrastructure development plans and private sector growth initiatives require significant capital management skills. With a presence in 34 countries and service to 51 countries, Deloitte is well positioned and understands the nuances of doing business in Africa.

Our pan-African I&CP team functions as an integrated team, with dedicated professionals based in South Africa, Zimbabwe, Kenya, Tanzania, Uganda, Ghana, Côte d'Ivoire, France, the United Arab Emirates, Tunisia and Nigeria, serving governments and private sector clients across the continent.

As a team we welcome your thoughts and considerations on this and future reports of this nature.

**J-P Labuschagne**  
**Deloitte Africa Infrastructure & Capital Projects Leader**



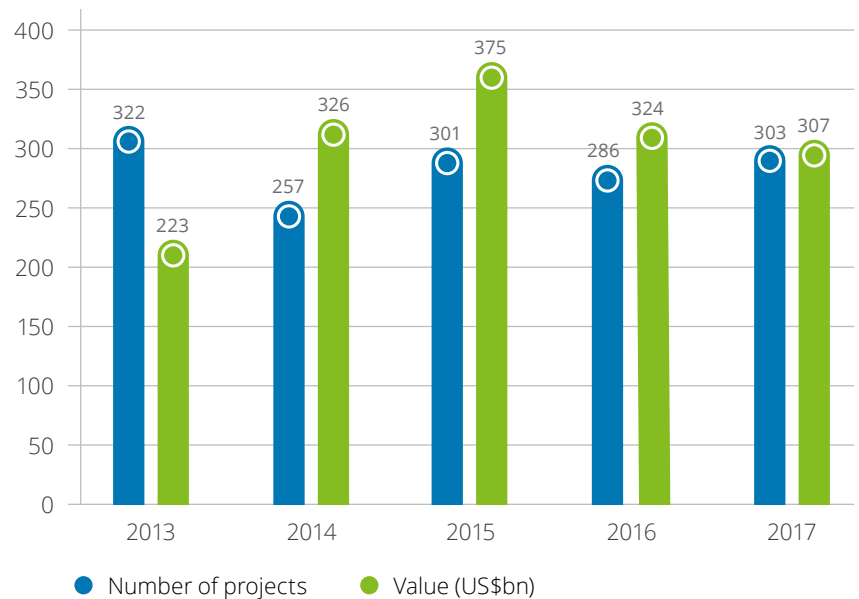
# Africa Construction in Focus

The 2017 edition of Deloitte's *Africa Construction Trends* report includes 303 projects valued at US\$50m or above that had broken ground by 1 June 2017. In total, these projects are worth US\$307bn.

The number of projects qualifying for inclusion increased by 5.9%, while the total value of projects shrunk by 5.2% year-on-year. As a region, Southern Africa has the largest number of projects with 93 projects while West Africa remains as the region with the largest share of projects in terms of value, worth US\$98.3bn.

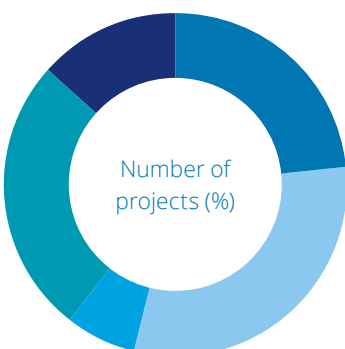
The projects included are spread between 38 of Africa's 54 countries. South Africa is the single country with the most projects (44 projects) while Nigeria has the most projects by value (worth US\$69.1bn).

## Continental statistics

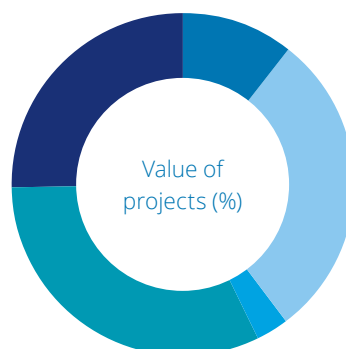


Source: Deloitte analysis, 2017

## Regional split

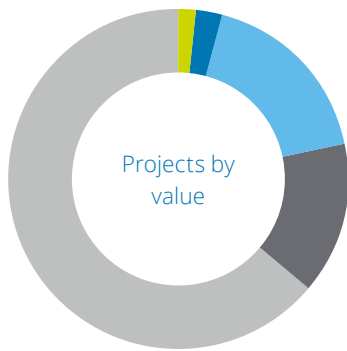


- East Africa (23.4%)
- Southern Africa (30.7%)
- Central Africa (6.6%)
- West Africa (26.1%)
- North Africa (13.2%)



- East Africa (10.6%)
- Southern Africa (29.2%)
- Central Africa (3.2%)
- West Africa (32%)
- North Africa (25.1%)

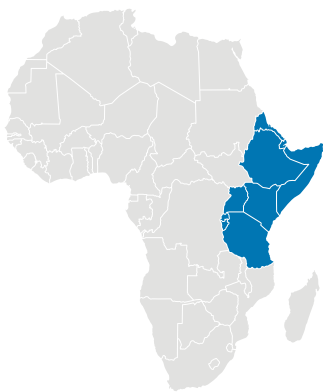
Source: Deloitte analysis, 2017. May not total to 100% due to rounding



- Over US\$10bn - 5 projects (1.7%)
- US\$5.1bn-US\$10bn - 8 projects (2.6%)
- US\$1.1bn-US\$5bn - 53 projects (17.5%)
- US\$501m-US\$1bn - 44 projects (14.5%)
- US\$50m-US\$500m - 193 projects (63.7%)

The majority of projects in this year's edition lie in the lower US\$50m-US\$500m project value range. This is almost identical to the value-split in 2016. It is worth noting that 66 projects, or one in five projects, are valued at more than US\$1bn. Of these, 13 projects are valued at over US\$5bn. Oil & Gas projects account for four of the five projects valued at over US\$10bn.

Source: Deloitte analysis, 2017



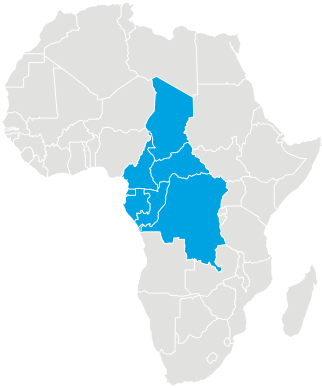
### East Africa

	2013	2014	2015	2016	2017	2017% of continental projects
<b>Number of projects</b>	93	51	61	43	71	23.4%
<b>Value (US\$bn)</b>	67.7	60.7	57.5	27.4	32.6	10.6%

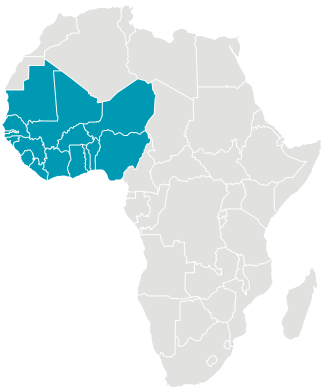


### Southern Africa

	2013	2014	2015	2016	2017	2017% of continental projects
<b>Number of projects</b>	124	119	109	85	93	30.7%
<b>Value (US\$bn)</b>	83.2	144.9	140	93.4	89.7	29.2%



<b>Central Africa</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2017% of continental projects</b>
<b>Number of projects</b>	17	13	23	24	20	6.6%
<b>Value (US\$bn)</b>	15.3	33.2	35.8	7	9.8	3.2%



<b>West Africa</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2017% of continental projects</b>
<b>Number of projects</b>	66	66	79	92	79	26.1%
<b>Value (US\$bn)</b>	49.9	74.8	116.2	119.8	98.3	32%



<b>North Africa</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2017% of continental projects</b>
<b>Number of projects</b>	22	8	29	42	40	13.2%
<b>Value (US\$bn)</b>	6.7	9.1	25.8	76.1	77.1	25.1%











Source: Deloitte analysis, 2017. May not total to 100% due to rounding

This year, East Africa has seen a significant jump in the number of projects. In total, the number of projects increased by 65.1% although the value of projects only rose by 18.8%. This suggests that the region is pursuing a greater number of lower-value projects. Central Africa saw the greatest

increase in the value of projects between 2016 and 2017, with an increase of 34.9%. However, this is from a low base.

North Africa, Central Africa and West Africa all saw a decrease in the number of projects included in this edition of the

report, while only Southern Africa and West Africa saw a decrease in the total value of projects.

Projects by sector (number of projects)	Number of projects	Share of projects by number (%)	Value of projects (US\$bn)	Share of projects by value (%)
 <b>Energy &amp; Power</b>	58	19.1%	67.4	21.9%
 <b>Transport</b>	109	36%	71.6	23.3%
 <b>Real Estate</b>	68	22.4%	42.3	13.8%
 <b>Water</b>	14	4.6%	3.8	1.2%
 <b>Mining</b>	10	3.3%	7.8	2.5%
 <b>Oil &amp; Gas</b>	13	4.3%	76.9	25%
 <b>Shipping &amp; Ports</b>	24	7.9%	36.3	11.8%
 <b>Social Development</b>	2	0.7%	0.4	0.1%
 <b>Healthcare</b>	3	1%	0.4	0.1%
 <b>Education</b>	2	0.7%	0.6	0.2%

Source: Deloitte analysis, 2017. May not total to 100% due to rounding
















Similarly to last year, the greatest number of projects fall into the Transport sector (36%), followed by Real Estate (22.4%), Energy & Power (19.1%) and Shipping & Ports (7.9%).

The share of Mining projects and projects in the Oil & Gas sector have remained low at 3.3% and 4.3% respectively as many large-scale projects remain suspended. Oil











& Gas remains a valuable sector, however, accounting for a quarter of total project value.

Large-scale investment into social development projects remains low with only 1.2% of total investment going to the Water sector and even less into Education (0.2%), Social Development and Healthcare (0.1% each).

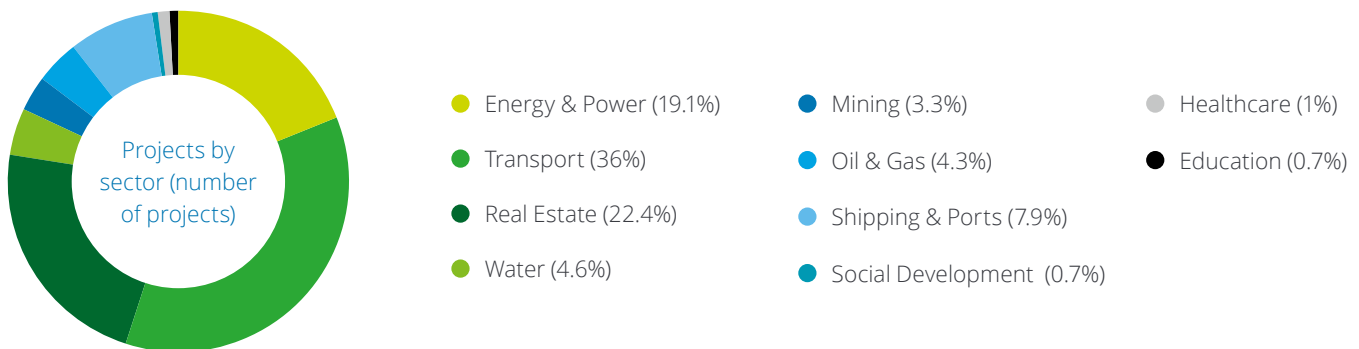
Between 2016 and 2017, there were two fewer Energy & Power projects in Africa and three fewer Healthcare projects. The number of projects in the Transport sector increased by 13 projects. The Real Estate and Mining sectors saw an increase in the number of projects, by four and two projects respectively. Encouragingly, the total number of Water projects increased by three projects.

Projects by sector	2013%	2014%	2015%	2016%	2017%
 Energy & Power	31	37	28	21	19
 Transport	18	34	37	34	36
 Real Estate	17	6	6	22	22
 Water	9	5	8	4	5
 Mining	19	9	7	3	3
 Oil & Gas	1	4	6	5	4
 Shipping & Ports	/	/	/	8	8
 Social Development	/	/	4	1	1
 TMT	/	1	1	/	/
 Healthcare	2	1	1	2	1
 Education	1	1	1	1	1
 Agriculture	1	1	/	/	/
 Mixed Use	1	1	1	/	/

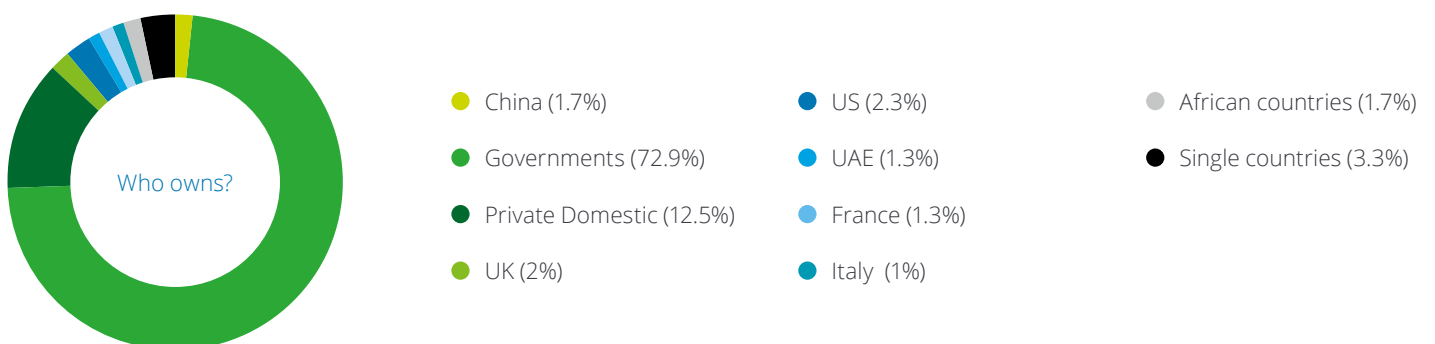
Source: Deloitte analysis, 2017. May not total to 100% due to rounding

Projects by sector	Number of projects	Share of projects by number (%)	Change in number of projects from 2016 <sup>1</sup>
 <b>Energy &amp; Power</b>	58	19.1%	-2
 <b>Transport</b>	109	36%	13
 <b>Real Estate</b>	68	22.4%	4
 <b>Water</b>	14	4.6%	3
 <b>Mining</b>	10	3.3%	2
 <b>Oil &amp; Gas</b>	13	4.3%	0
 <b>Shipping &amp; Ports</b>	24	7.9%	0
 <b>Social Development</b>	2	0.7%	0
 <b>Healthcare</b>	3	1%	-3
 <b>Education</b>	2	0.7%	0

Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017

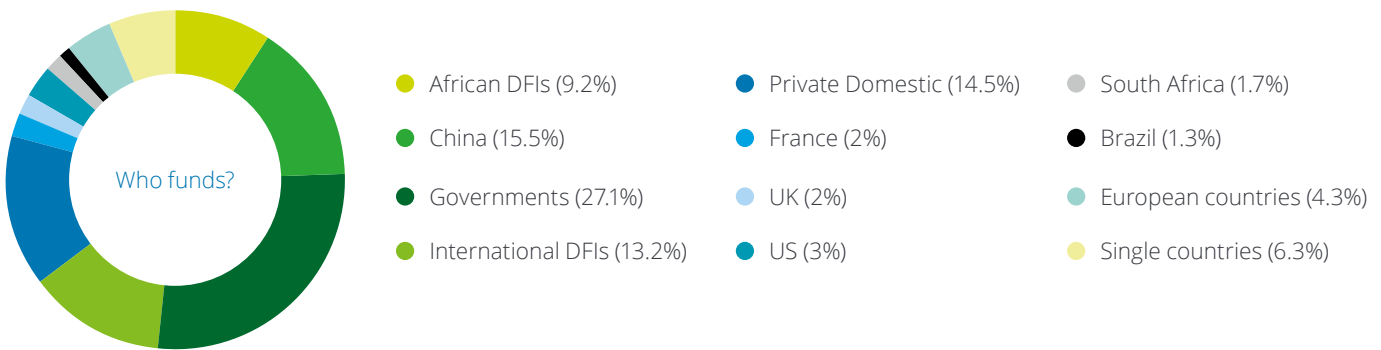


Source: Deloitte analysis, 2017. African countries include Angola, Nigeria, and South Africa. Single countries include Australia, Brazil, Canada, Germany, India, Macau, Netherlands, Singapore, Switzerland, and Turkey

Governments continue to own the largest share of projects with 221 projects (72.9%), or seven out of every 10 projects, followed by Private Domestic firms that own 12.5%. Firms domiciled in the United States (2.3%), the United Kingdom (2%) and China (1.7%) own seven, six and five projects respectively.

Entities that own, finance and construct projects are defined as the country where the owner, funder or builder is originally domiciled. In line with ownership, Governments continue to fund the largest share of projects, financing 82 projects (27.1%) in the period under review.

China funds 47 projects and Private Domestic firms fund 44, while International Development Finance Institutions (DFIs) finance 40 projects. African DFIs only fund 28 large-scale projects. The share of total projects that are funded by various entities has remained largely similar to the shares represented last year.



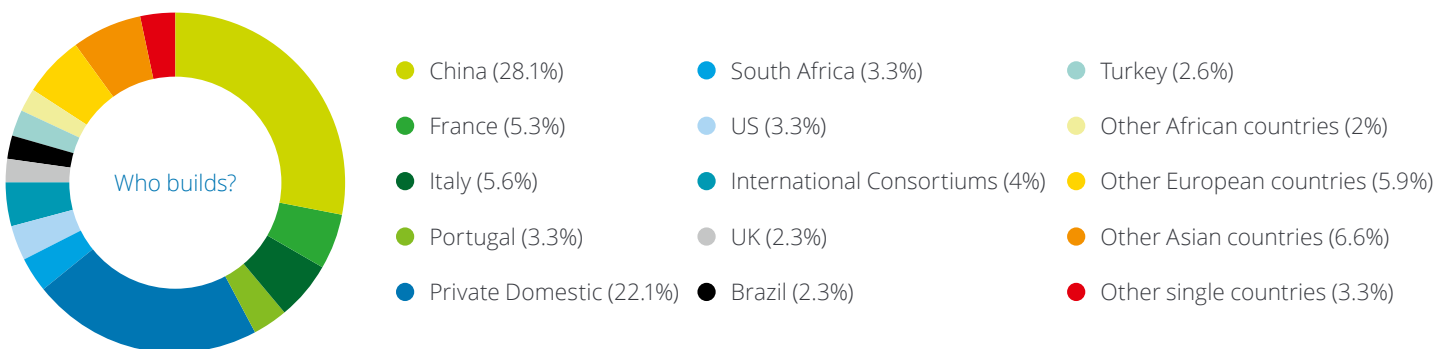
Source: Deloitte analysis, 2017. European countries include Germany, Italy, Netherlands, Portugal, and Switzerland. Single countries include Australia, Canada, India, Kuwait, Macau, Namibia, Nigeria, Qatar, Turkey, and the UAE

China has overtaken Private Domestic firms as the most prolific (and single country) builder of projects, constructing 85 projects as opposed to 67 last year and has gained ground relative to the other builders. Italian firms are the next most prominent builders, albeit some way

behind with 17 projects followed by French firms with 16 projects.

International Consortiums are busy with 12 projects while American, Portuguese and South African firms are building 10 projects each. Overall, Asian firms

construct approximately one in three projects, European firms build one in five projects and African firms (including Private Domestic firms) are responsible for one in four projects.



Source: Deloitte analysis, 2017. Other African countries include Botswana, Egypt, Equatorial Guinea, Tunisia, Uganda, and Zambia. Other European countries include Belgium, Germany, the Netherlands, Spain, Sweden, and Switzerland. Other Asian countries include India, Japan, Macau, Malaysia, Singapore, and South Korea. Other single countries include Australia, Canada, Lebanon, Saudi Arabia, and the UAE



# Economic Realities for Infrastructure & Capital Projects Spending

In October 2017, the International Monetary Fund (IMF) revised its global growth outlook upwards to 3.6% in 2017 and 3.7% in 2018. Growth in developed markets remains low at 2.2% while emerging markets are seeing a recovery to 4.6% in 2017.

Sub-Saharan Africa's (SSA) growth continues to languish at only 2.6%; but is expected to recover somewhat to 3.4% in 2018. This forecast growth figure is, however, below the world average. Although African regional growth rates are expected to rise gradually in the medium term, these remain barely above population growth and so will have a minimal impact on income growth.

Three of SSA's biggest four economies are growing incrementally. Both Nigeria and South Africa will experience growth of less than 1% in 2017, while Angola will grow at 1.5%. Ethiopia is the only exception among SSA's top four economies, exceeding the emerging market growth rate forecast to expand by 8.5% in both 2017 and 2018.

East Africa continues to be the best performing region, being one of the least dependent on hard commodity price movements. With countries such as Ethiopia, Kenya, Rwanda and Tanzania being the frontier growth stories of the continent, the region is expected to post the highest regional growth at 6.3% over the 2017-18 period.

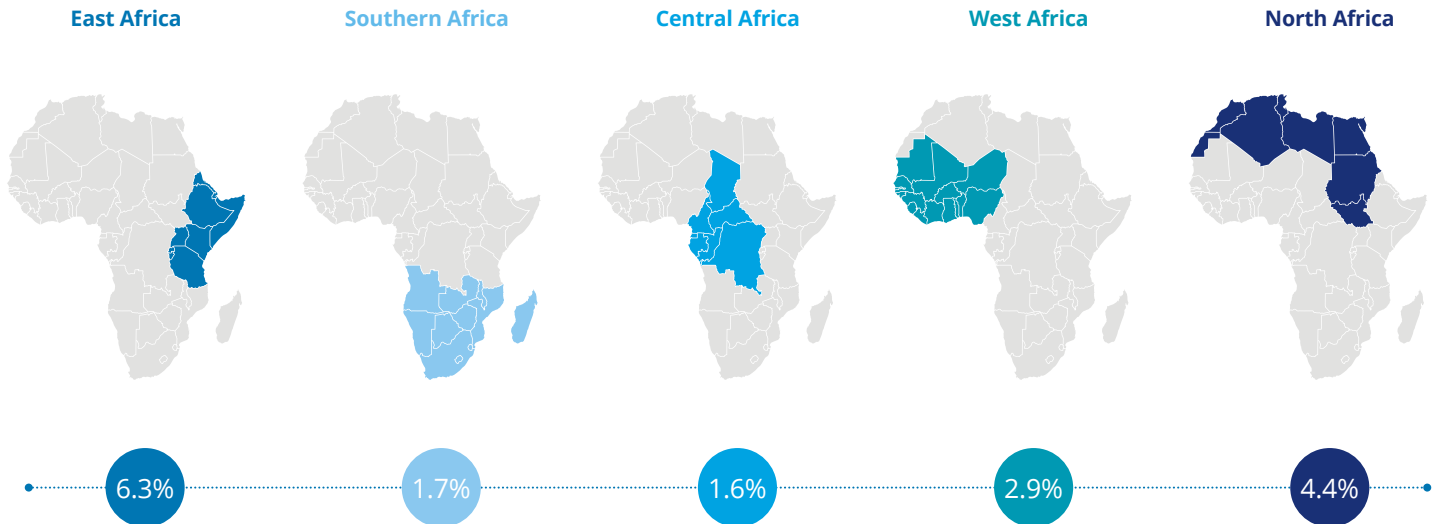
North Africa's weighted growth rate over the 2017-18 period is expected to be 4.4% as economic activity resumes in Libya. South Sudan's ongoing civil war however continues to drag on economic growth.

While Africa's growth has arguably bottomed out in 2016, commodity exporters (particularly fuel exporters) continue to struggle with low commodity prices. This has affected Central Africa where the average growth rate for 2017 is expected at only 0.9%, recovering to 1.6% over the 2017-18 period.

Similarly, despite economies such as Côte d'Ivoire, Ghana and Senegal expected to report growth of 5% or above in West Africa, the region's weighted growth – dragged down mostly by Nigeria – is only expected to reach 2.9% over the 2017-18 period. Similarly, Southern Africa is among the slowest growth regions for 2017-18.

SSA growth is thus expected to average 3.7% over the 2017-18 period, while Africa as a whole is likely to average 4.5% growth over the same period.

Regional weighted real GDP growth outlook (%), 2017f-18f



Source: Deloitte analysis based on IMF, 2017

Investment in infrastructure and capital projects (I&CP) is an important aspect for enabling GDP growth and more diversified economic and private sector activity. By providing access to basic services such as water, education and healthcare, infrastructure ensures that economic growth is sustainable and inclusive.

Investment in infrastructure tends to increase business confidence and lowers transaction costs, making it easier for companies to move people and goods, and to provide services. Infrastructure fosters competition, innovation and productivity. Governments that invest in enabling infrastructure are therefore seen as more proactive and often friendlier towards business and attracting investment, and more likely to achieve economic and export diversification objectives.

Gross fixed capital formation (GFCF) as a percentage of GDP, which includes land improvements and the construction of infrastructure by both the private and public sector, is indicative of infrastructure spend of countries.

Across Africa, GFCF varies strongly – both by country and by region. The larger the GFCF spend (relative to GDP), the more the country spends on improving and building infrastructure. A rule of thumb is that economies that are investing approximately 30% of GDP into GFCF are able to create an environment conducive to growth.

In 2016, SSA's average GFCF was 20.1% while the average for North Africa was 25%. North Africa also had the highest regional average of GFCF spend, followed closely by East Africa and Central Africa, both at 24.4%. For Central Africa, however, as many economies in that region are small, a smaller infrastructure project such as a new road will represent a high GFCF spend as a share of GDP.

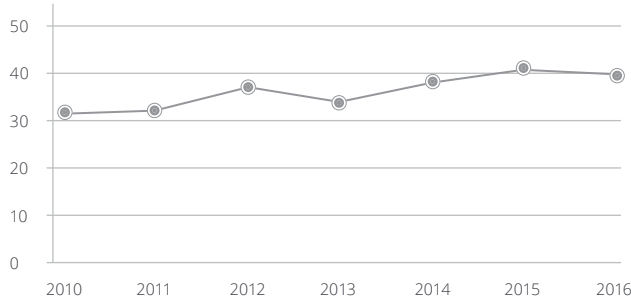
Four of the top five countries in terms of the number of infrastructure projects in this report (South Africa, Nigeria, Kenya and Egypt) spent less than the equivalent of 20% of GDP on GFCF in 2016. Egypt, Nigeria and South Africa, the continent's three largest economies, have consistently underspent on infrastructure in the last decade.

BMI forecasts expect GFCF spend for Nigeria to increase to 21.8% in 2020 from 17.4% in 2016. Forecasts for South Africa see an increase in spend by 0.4 percentage points only between 2016 and 2020, while for Egypt a 0.1 percentage point increase is estimated. Kenya is expected to decrease its GFCF spend by 0.8 percentage points.

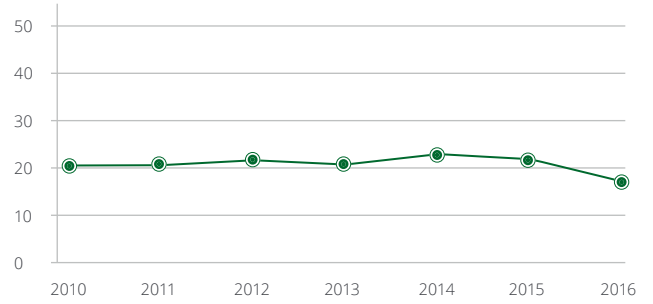
Only Ethiopia (the sixth largest economy on the continent in 2017) has consistently spent over the required 30% of GDP on GFCF, spending the equivalent of 40% of GDP in 2016, one of the highest GFCF ratios globally. This level of spending is expected to remain, reducing marginally to 39.2% of GDP in 2020.

GFCF of key countries for regions (GFCF as % of GDP), 2010-16

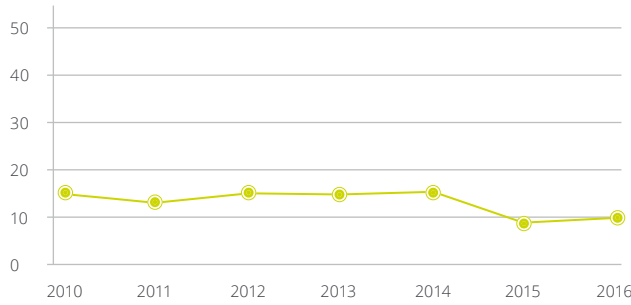
GFCF as % of GDP



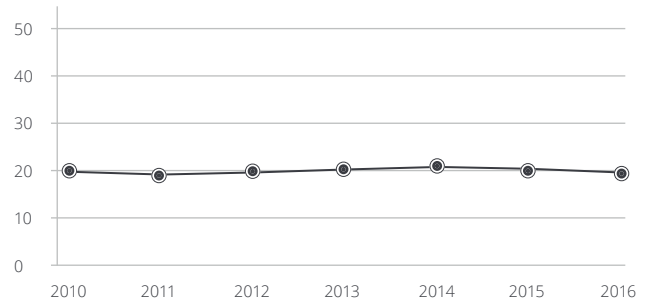
● Ethiopia



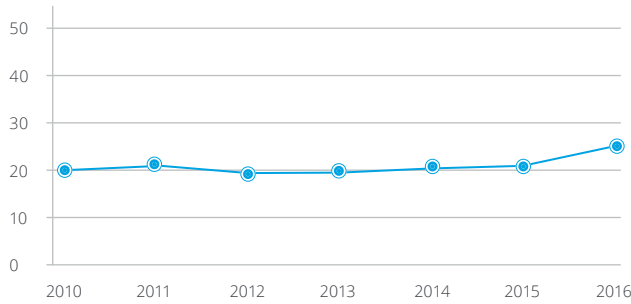
● Kenya



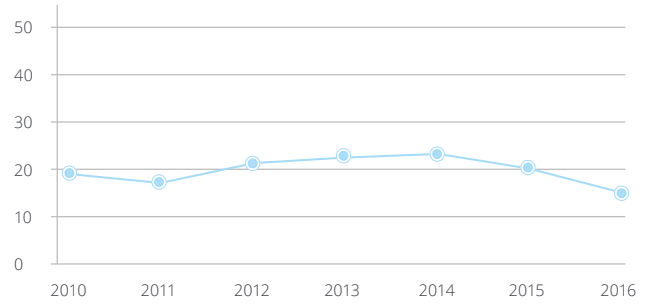
● Angola



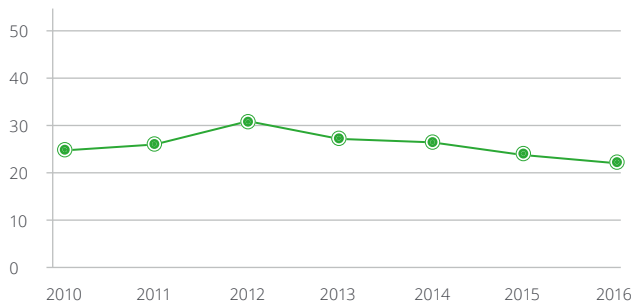
● South Africa



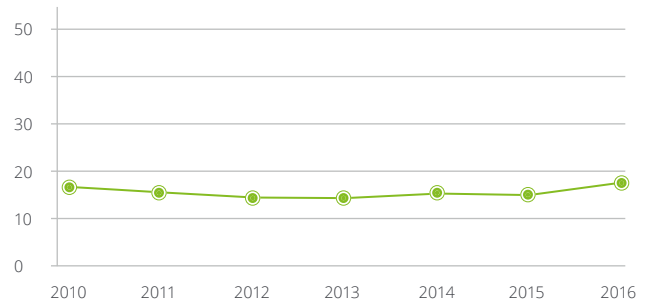
● Cameroon



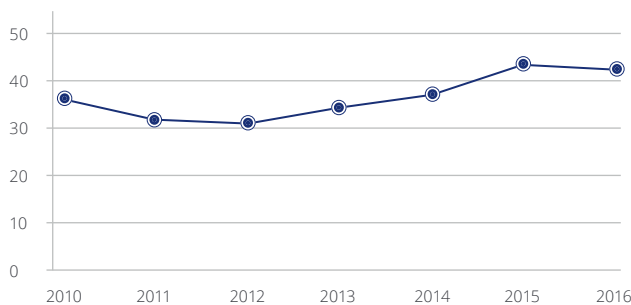
● DRC



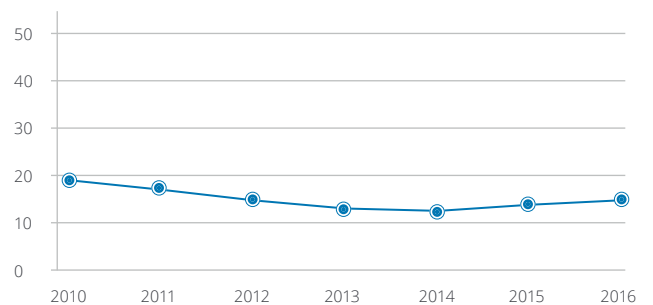
● Ghana



● Nigeria



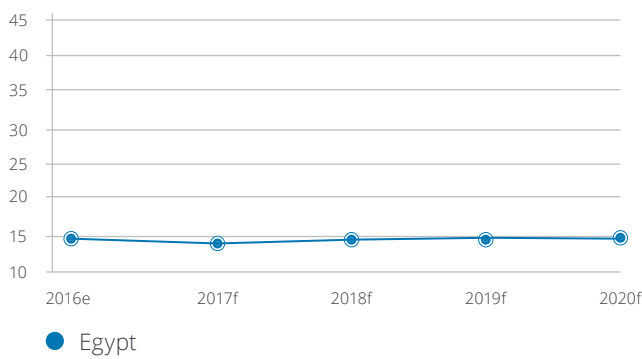
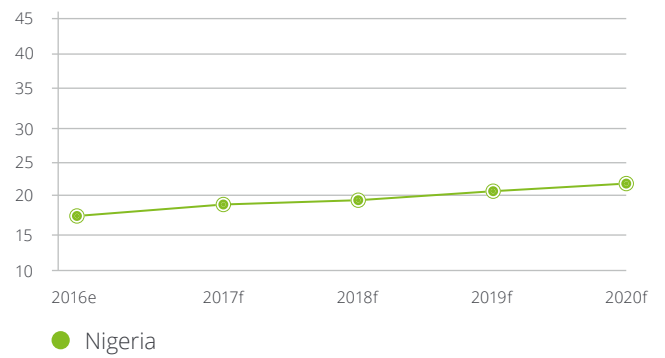
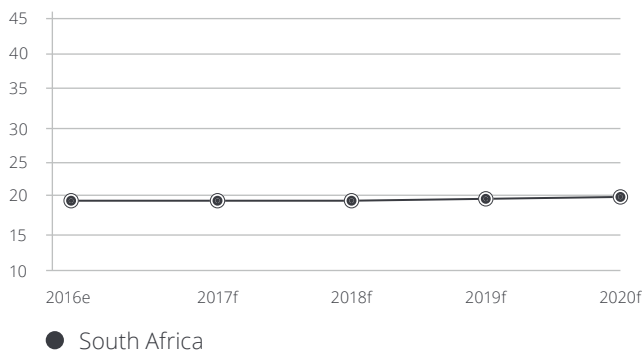
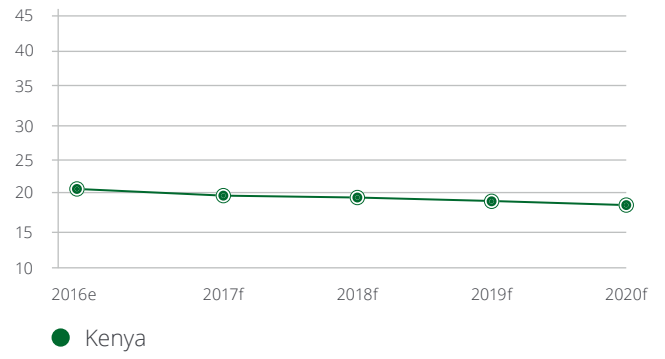
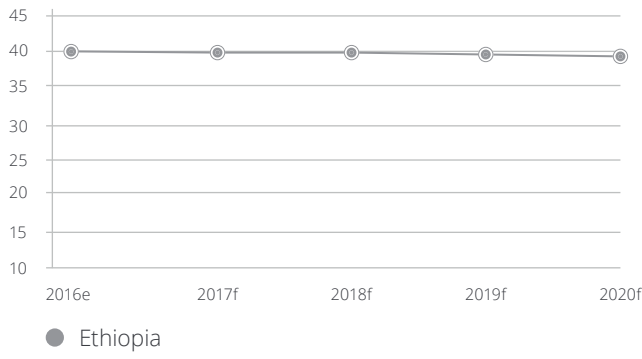
● Algeria



● Egypt

Source: World Bank, 2017<sup>2</sup>

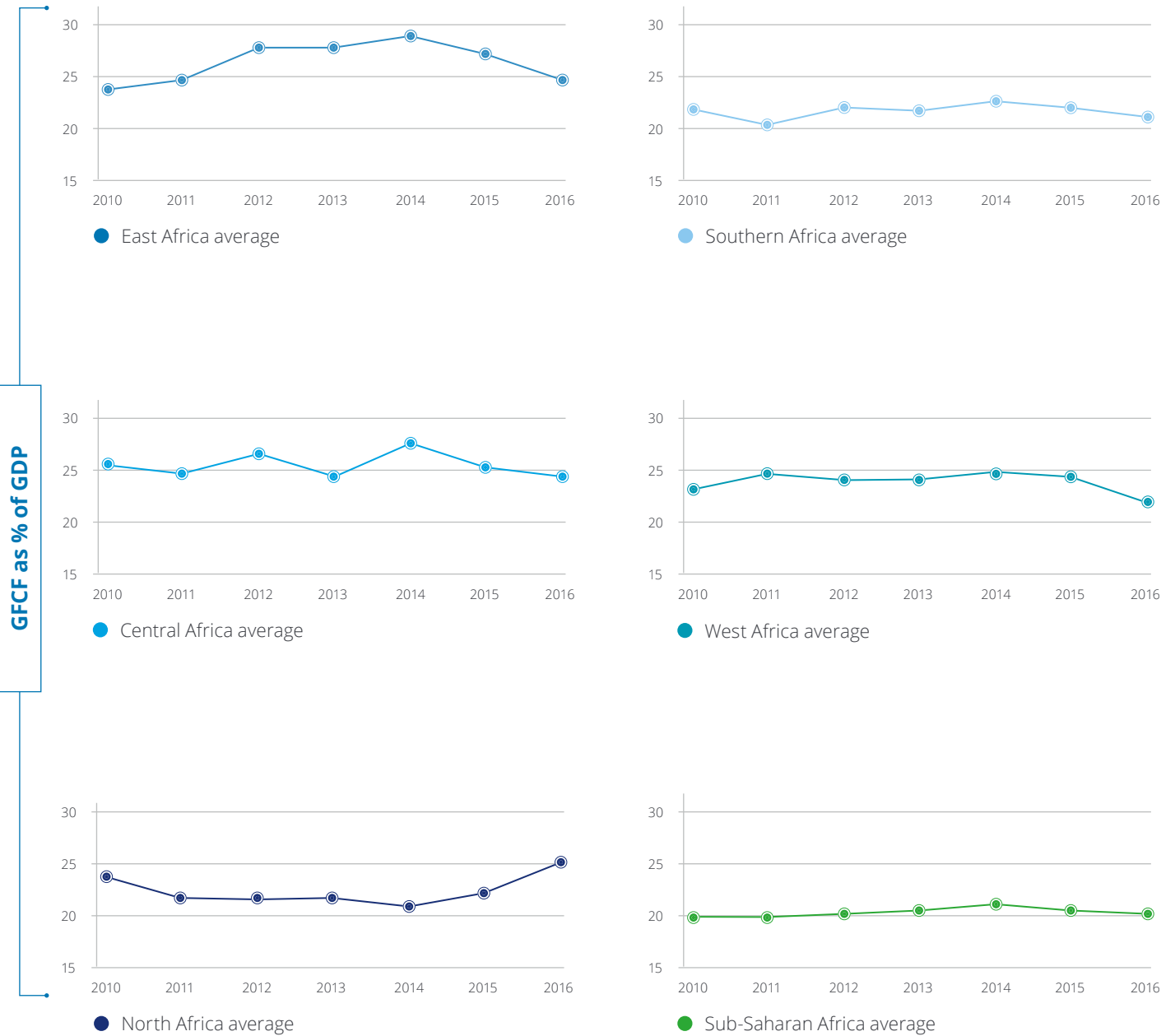
GFCF forecasts by country (GFCF as % of GDP), 2016e-20f



Source: BMI, 2017<sup>3</sup>



GFCF by region (GFCF as % of GDP), 2010-16



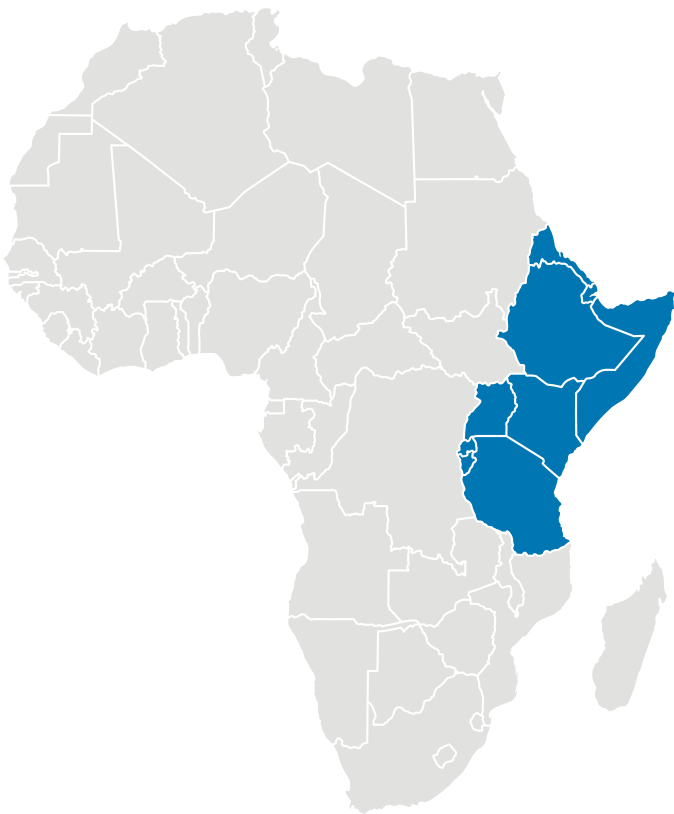
Source: World Bank, 2017<sup>4</sup>



# Regional Construction Focus

## East Africa












	2013	2014	2015	2016	2017	2017% of continental projects
<b>Projects</b>	93	51	61	43	71	23.4%
<b>Value (US\$bn)</b>	67.7	60.7	57.5	27.4	32.6	10.6%



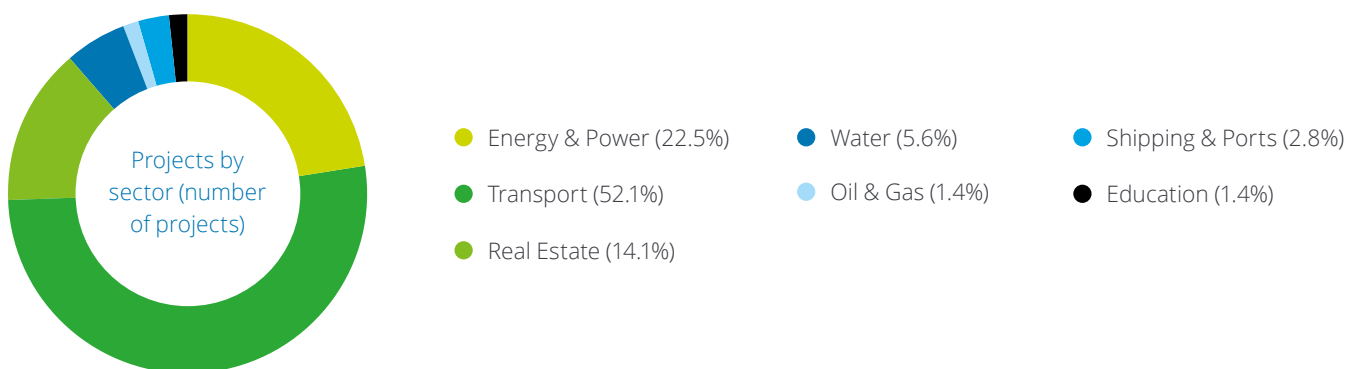
East Africa – which includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Seychelles, Somalia, Tanzania and Uganda – has 71 projects valued at US\$32.6bn. East Africa accounts for 23.4% of projects on the continent and 10.6% in terms of US dollar value.

The total number of projects in East Africa has risen by a substantial 65.1% between 2016 and 2017 while the increase in the total US dollar value of projects has been much lower, but still considerable at 20.7%.

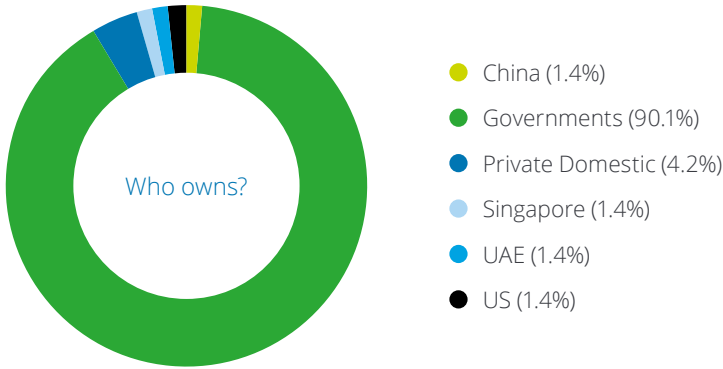
Although Kenya has the largest number of projects in East Africa (23 versus Ethiopia's 20), the total value of projects in Ethiopia is almost twice that of the value of projects in Kenya. Ethiopia overtook Kenya as the largest economy in East Africa in 2016.

Projects by sector	2013%	2014%	2015%	2016%	2017%
 <b>Energy &amp; Power</b>	37	37	30	26	23
 <b>Transport</b>	42	59	51	47	52
 <b>Real Estate</b>	/	/	1	11	14
 <b>Water</b>	/	/	8	/	6
 <b>Mining</b>	2	2	2	/	/
 <b>Oil &amp; Gas</b>	/	2	3	2	1
 <b>Shipping &amp; Ports</b>	/	/	/	9	3
 <b>Social Development</b>	/	/	5	/	/
 <b>Healthcare</b>	/	/	/	5	/
 <b>Education</b>	/	/	/	/	1
 <b>Other</b>	19	/	/	/	/

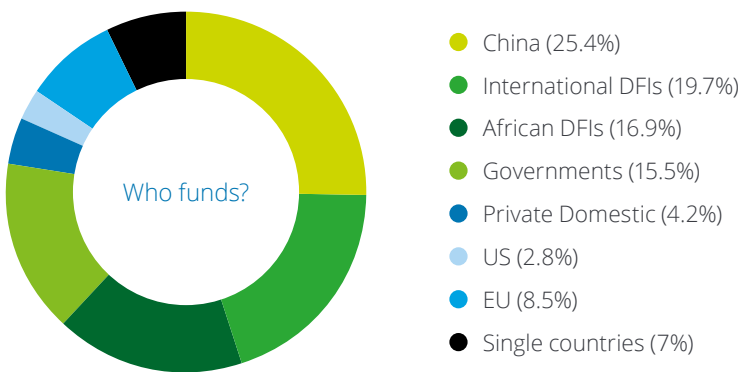
Source: Deloitte analysis, 2017. May not total 100% due to rounding



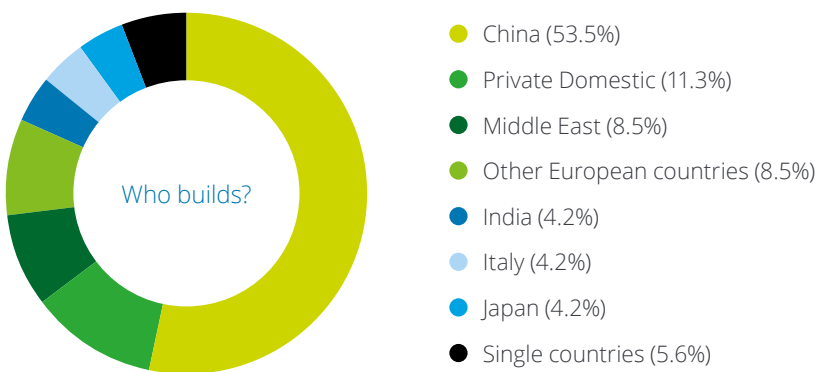
Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017. EU includes France, Italy, and Portugal  
Single countries include Kuwait, Switzerland, Turkey, UAE, and the UK



Source: Deloitte analysis, 2017. Middle East includes Lebanon, Turkey, and the UAE  
Other European countries includes Germany, the Netherlands, Portugal, Spain, and Switzerland  
Single countries include South Korea, Uganda, and the US

The Transport sector, this year accounting for more than half of projects, continues to be the largest sector, with 27 Road & Bridge projects currently underway. Energy & Power projects are also significant, accounting for nearly a quarter of all projects in East Africa.

Transport and energy supply and access are integral to the East African Community's (EAC) Development Strategy. As a result, various cross-border projects are currently underway including the construction of the 1,672km standard gauge railway linking Rwanda, Burundi and Tanzania. The completed project, valued at US\$7.6bn (although construction has not yet started on all sections), will provide both freight and passenger services between Dar es Salaam and Kigali and forms part of the Central Corridor.

In addition to the Central Corridor, the LAPSSET (Lamu Port, South Sudan, Ethiopia Transport) Corridor and Northern Corridor projects will aid regional integration in East Africa and it is anticipated that these large-scale cross-border projects will drive both intra-regional and international trade. LAPSSET includes port projects, highways, railways, an oil pipeline and airport projects. The East African Power Pool (EAPP) aims to create a fully integrated and operational regional power market and many projects currently under construction will feed into this.

Governments continue to own the vast majority of projects (90.1%). Roughly, only one in 10 projects are not Government-owned. East Africa is one of the regions where Governments are most proactive in driving projects through both national and regional infrastructure development plans. Private Domestic firms only own 4.2% of projects. Private firms from China, Singapore, the UAE and the US own the remaining 5.6% of projects in East Africa.

However, Governments only fund 15.5% of projects. China is the most prolific funder of large-scale construction projects in East Africa, financing one in four projects in the region. International DFIs follow with 19.7%, and have overtaken African DFIs, which fund 16.9% of projects.

China is also the most visible builder, now constructing over half of all projects. Private Domestic firms are responsible for building 11.3% of projects while firms from the Middle East and other European countries each build 8.5% of projects.

Indian, Italian and Japanese companies are involved in building 4.2% of projects each and companies from South Korea, Uganda and the US are responsible for the remaining 5.6%.











Although still highly concentrated, East Africa's ten largest projects account for

only 55.1% of the total US dollar value of projects in the region. Given the importance of Transport and Energy & Power projects to the EAC's Development Strategy, it is no surprise that these two sectors account for 90% of the region's largest projects.

The Grand Ethiopian Renaissance Dam (GERD), worth US\$4.1bn, remains the most valuable project in the region. Half of the projects in the top ten are new projects. A number of the largest projects from 2016 have either been completed or replaced by new larger projects.

The second largest project in 2016, the Mombasa-Nairobi Railway, was opened in May 2017 and the Tatu City Project, 2016's fourth largest project, is currently between phases and so not undergoing construction. The Lake Turkana Wind Power Project, the single largest private sector investment in Kenya's history, is set to go live in early 2018. Although the wind farm is already complete the transmission line still needs to be completed.

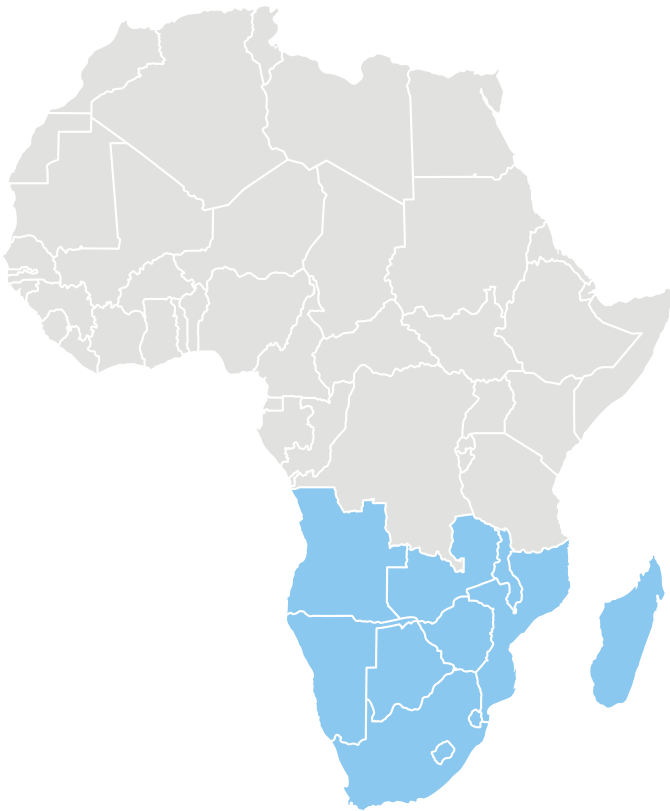
### Top 10 projects (by value)

Country	Project		Sector	US\$bn
<b>Ethiopia</b>	Grand Ethiopian Renaissance Dam		Energy & Power	4.1
<b>Ethiopia</b>	Koysha Hydroelectric Dam		Energy & Power	2.8
<b>Rwanda</b>	Kigali Innovation City		Real Estate	1.9
<b>Ethiopia</b>	Awash-Woldia-Hara Gebeya Rail Project		Transport	1.7
<b>Uganda</b>	Karuma Hydropower Plant		Energy & Power	1.6
<b>Kenya</b>	Nairobi-Naivasha Rail Project		Transport	1.5
<b>Tanzania</b>	Mtwara Gas Project		Energy & Power	1.3
<b>Ethiopia</b>	Mieso-Dire Dawa-Deweale Railway Line		Transport	1.2
<b>Tanzania</b>	Central Railway		Transport	1
<b>Kenya</b>	Lake Turkana Wind Power Project		Energy & Power	0.9

Source: Deloitte analysis, 2017

# Southern Africa

	2013	2014	2015	2016	2017	2017% of continental projects
<b>Projects</b>	124	119	109	85	93	30.7%
<b>Value (US\$bn)</b>	83.2	144.9	140	93.5	89.7	29.2%



Southern Africa – consisting of Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe – has 93 projects in total, valued at US\$89.7bn.

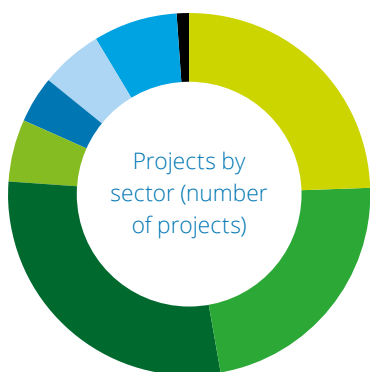
The region accounts for 30.7% of all projects in Africa and 29.2% in terms of US dollar value.

Overall, the number of projects in Southern Africa increased by 9.4% from 2016 while the value of projects decreased by 4.1%. This is largely due to the continued suspension of the Lobito Refinery in Angola, which was included in the analysis last year. The project was suspended in September 2016 in light of lower oil revenues.

South Africa continues to account for the largest share of infrastructure and capital project activity in Southern Africa with 47.3% of projects, followed by Angola with 14% and Mozambique with 12.9% of projects.

Projects by sector	2013%	2014%	2015%	2016%	2017%
 <b>Energy &amp; Power</b>	31	44	34	25	25
 <b>Transport</b>	18	24	27	20	23
 <b>Real Estate</b>	17	7	7	31	29
 <b>Water</b>	9	5	8	7	5
 <b>Mining</b>	19	10	12	5	4
 <b>Oil &amp; Gas</b>	1	2	3	5	5
 <b>Shipping &amp; Ports</b>	/	/	/	7	8
 <b>Social Development</b>	/	/	4	/	/
 <b>TMT</b>	/	2	2	/	/
 <b>Healthcare</b>	2	1	2	1	1
 <b>Education</b>	1	1	1	/	/
 <b>Agriculture</b>	1	1	/	/	/
 <b>Mixed Use</b>	/	3	/	/	/
 <b>Other</b>	1	/	/	/	/

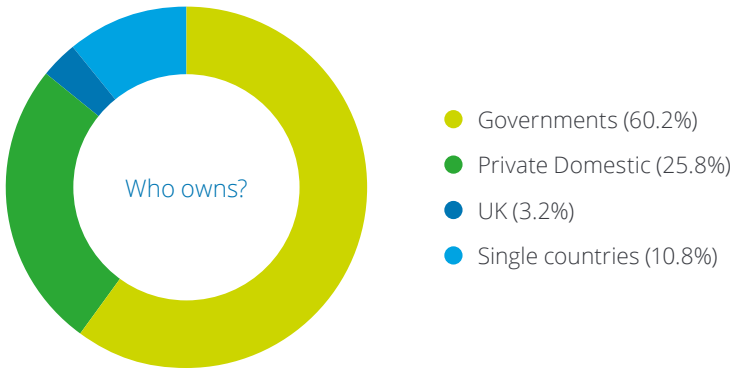
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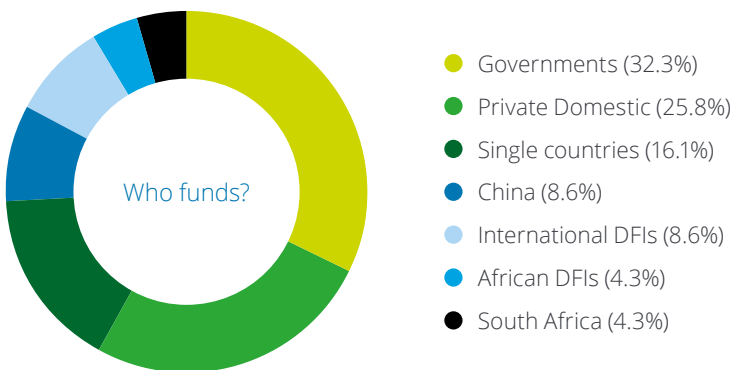
- Energy & Power (24.7%)
- Transport (22.6%)
- Real Estate (29%)
- Water (5.4%)
- Mining (4.3%)
- Oil & Gas (5.4%)
- Shipping & Ports (7.5%)
- Healthcare (1.1%)

Source: Deloitte analysis, 2017

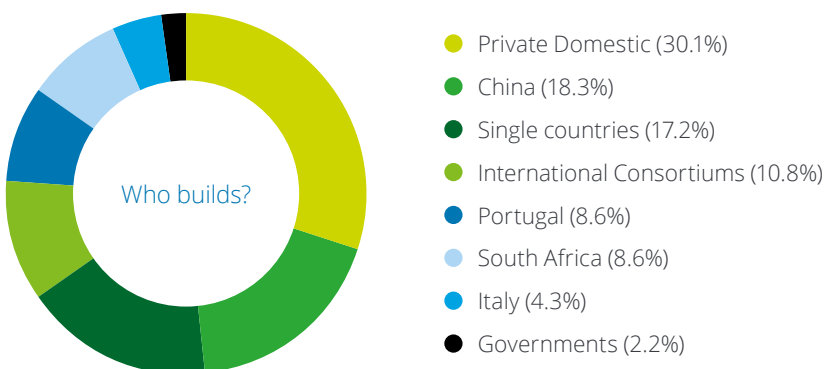




Source: Deloitte analysis, 2017. Single countries include Angola, Brazil, China, France, India, Italy and SA



Source: Deloitte analysis, 2017. Single countries include Brazil, France, India, Namibia, Portugal, the UK, and the US



Source: Deloitte analysis, 2017. Single countries include Botswana, Brazil, Canada, France, Japan, the Netherlands, South Korea, Spain, the UK, and Zambia

The Real Estate sector accounts for 29% of projects, followed by Energy & Power with 24.7%. Transport projects make up the third largest share at 22.6% of projects, followed by Shipping & Ports with 7.5%, and Oil & Gas and Water both at 5.4%. However, in US dollar terms, Energy & Power projects dominate, worth US\$33.6bn. The next largest sector, Oil & Gas is valued at US\$22.6bn.

The Transport sector saw the greatest growth in the number of projects featured, growing 24% with four new projects beginning construction between 2016 and 2017. Angola is home to two of the new Transport projects, namely the Maria Mambo Café Airport Modernisation and the Quitexe - Ambuila - Quipedro Road Rehabilitation Project.

The number of Water projects saw the only decline in terms of number of projects, from six projects in 2016 to five in 2017 following the completion of the Mokolo and Crocodile Water Augmentation Project in South Africa. There were no new Mining projects with the sector remaining stagnant with four projects. All other sectors saw a slight increase in the number of projects.

In Southern Africa, Government-owned projects account for 60.2% of total projects, followed by Private Domestic-owned projects with 25.8% and UK-owned projects at 3.2%. Single countries (combined) own 10.8% of projects.

In line with the projects featured in 2016, Governments in Southern Africa fund the greatest share of projects, funding 32.3% of projects in the region. Private Domestic entities fund a further 25.8% of projects.

International DFIs and African DFIs fund only 8.6% and 4.3% of projects respectively. China funds 8.6% and South African-based entities fund 4.3% of projects in Southern Africa, outside of South Africa. Various other countries fund the remaining 16.1% of featured projects.

Southern Africa has seen a range of organisations from all over the world taking responsibility for the construction of large projects.

Private Domestic construction organisations build 30.1% of projects, while Chinese companies build 18.3%. Chinese contractors are concentrated in Zimbabwe, where they are constructing five projects and in Angola where four Chinese-built projects are currently underway.

International Consortiums are more prominent in Southern Africa than in other regions, building 10.8% of projects. International Consortiums are defined as companies that have combined expertise in order to tackle a specific project, where each company is responsible for the construction of a specific part or component of the project.

Portuguese firms continue to construct projects in Portugal's former colonies, Angola and Mozambique but have also continued with the construction of projects in Malawi and Zambia, constructing 8.6% of projects in the region. South African firms also continue to be prominent in other countries in the region, also with 8.6% of projects. South African construction firms are involved in the construction of projects in Angola, Botswana, Mozambique, Zambia and Zimbabwe.

Italian firms build 4.3% and Government-owned companies are responsible for 2.2% of projects respectively. Companies from a number of countries are responsible for less than three projects (less than 4% of projects) each and make-up the remaining 17.2% of projects.

South Africa has the largest share of the top 10 projects in the region, with four projects while Angola is home to three projects. Mozambique and Zambia account for the remaining projects, with two projects in Mozambique and one in Zambia. The top 10 projects account for 63.4% of total project value in US dollar terms in Southern Africa.

The Kaombo, Block 32 project in the Oil & Gas sector remains the largest project in the region, worth US\$16bn. The Kusile Coal-Fired Power Plant in South Africa is the second largest project in Southern Africa with a price tag of US\$7.9bn, followed by Modderfontein City, a US\$7.3bn Real Estate project also in South Africa.

The Coral South Floating LNG Facility in Mozambique, valued at US\$4.6bn, is the only new addition to the top 10 projects list from 2016.

The Lobito Refinery in Angola, with a price tag of US\$8bn, which was the second largest project in 2016, is no longer included in the list of featured projects after Sonangol suspended the project in September 2016. Construction continues to be suspended. The Luanda International Airport is scheduled for completion in 2017 and Kaombo, Block 32 will likely start production in early 2018.

The 2,070MW Lauca Hydropower Plant, Angola's largest hydropower project and the largest hydropower project on the continent, began generation in July 2017, although construction was still underway on 1 June, the cut-off date for this edition of the report. The Lauca Hydropower Project forms part of the Angolan government's wider plan to produce 9GW of energy (from hydropower and other sources) by 2025.

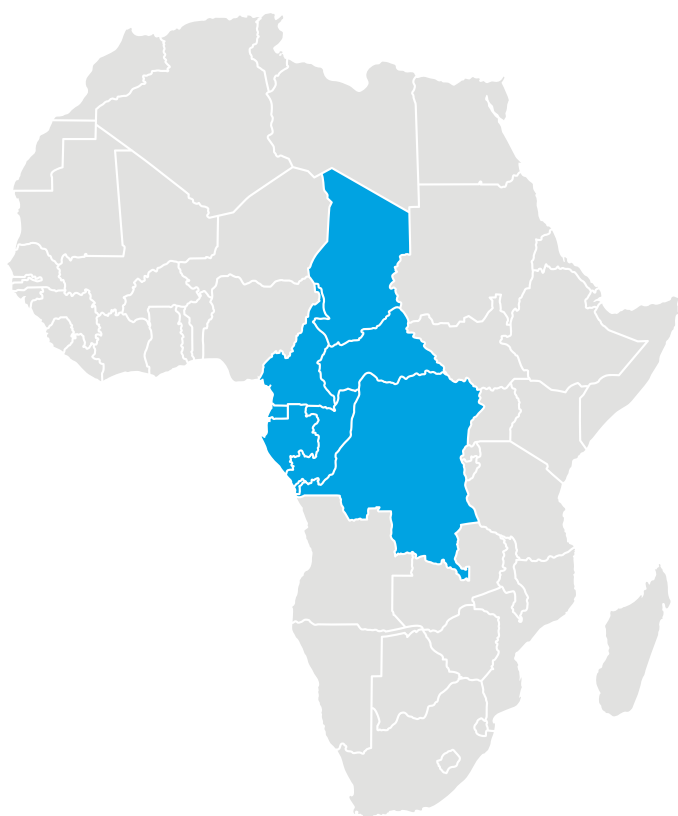
## Top 10 projects (by value)

Country	Project		Sector	US\$bn
Angola	Kaombo, Block 32		Oil & Gas	16
South Africa	Kusile Coal-Fired Power Plant		Energy & Power	7.9
South Africa	Modderfontein City		Real Estate	7.3
South Africa	Medupi Power Station		Energy & Power	7
Mozambique	Coral South Floating LNG Facility		Oil & Gas	4.5
Angola	Lauca Hydropower Plant		Energy & Power	4.3
Angola	Luanda International Airport		Transport	3.8
Mozambique	Moatize Expansion		Mining	2.1
South Africa	Venetia Diamond Mine		Mining	2
Zambia	Kafue Gorge Lower Power Plant Project		Energy & Power	2

Source: Deloitte analysis, 2017

# Central Africa









	2013	2014	2015	2016	2017	2017% of continental projects
<b>Projects</b>	17	13	23	24	20	6.6%
<b>Value (US\$bn)</b>	15.3	33.2	35.8	7	9.8	3.2%



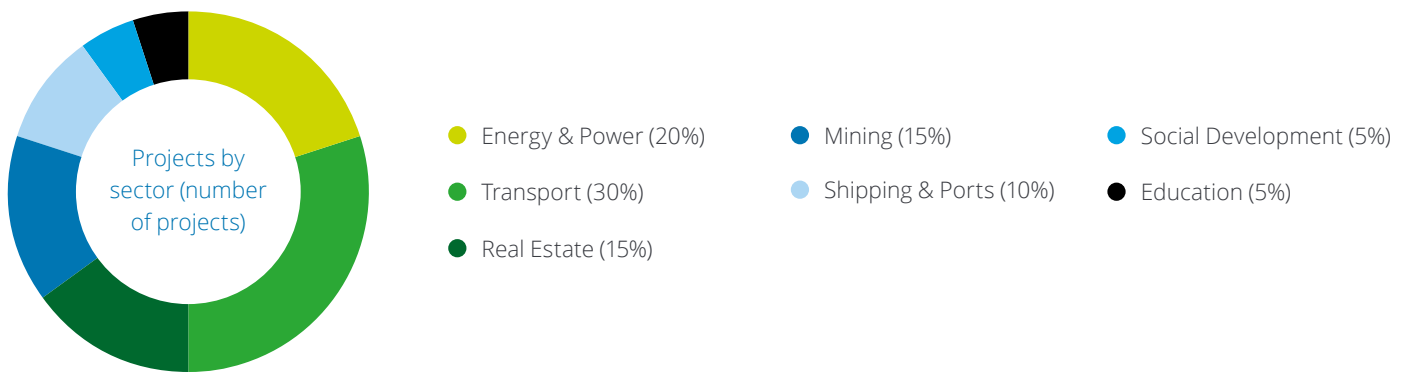
Cameroon, Central African Republic, Chad, the Democratic Republic of the Congo (DRC), Equatorial Guinea, Gabon, the Republic of the Congo and São Tomé and Príncipe make up Central Africa. The region represents 6.6% of all projects in Africa and 3.2% in terms of US dollar value.

Central Africa continues to be negatively affected by lower commodity prices, as all countries in the region are resource dependent. In total Central Africa is home to 20 projects worth US\$9.8bn. Although the number of projects in the region decreased by 16.7% between 2016 and 2017, the US dollar value increased by 40% largely due to the addition of two large new projects; the Kamo-Kakula Copper Project in the DRC and the Sonara Expansion Project in Cameroon.

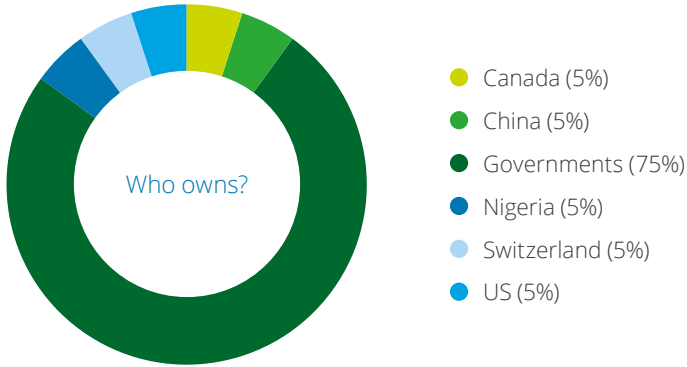
Cameroon accounts for the largest share of infrastructure and capital project activity in the region with 60% of all projects, and accounts for 56.8% of projects by value. The DRC has four projects, accounting for 28.3% of the total project value in Central Africa.

Projects by sector	2013%	2014%	2015%	2016%	2017%
 <b>Energy &amp; Power</b>	35	27	19	29	20
 <b>Transport</b>	18	60	65	42	30
 <b>Real Estate</b>	12	6	4	8	15
 <b>Water</b>	6	/	4	4	/
 <b>Mining</b>	29	7	4	8	15
 <b>Shipping &amp; Ports</b>	/	/	/	4	10
 <b>Social Development</b>	/	/	4	4	5
 <b>Education</b>	/	/	/	/	5

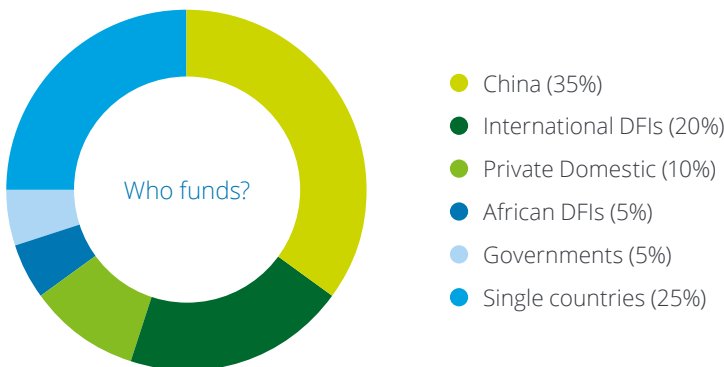
Source: Deloitte analysis, 2017. May not total 100% due to rounding



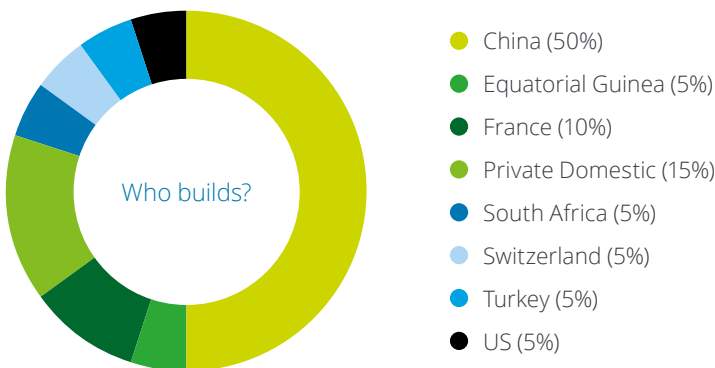
Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017. Single countries include Canada, Nigeria, Switzerland, Turkey, and the US



Source: Deloitte analysis, 2017

Transport projects continue to dominate the sectoral composition of projects in Central Africa, with 30% of projects, followed by Energy & Power at 20%, and Real Estate and Mining with 15% of projects each. The Mining sector is the most valuable sector accounting for 22.1% of total US dollar value, worth US\$2.1bn. Both Transport and Energy & Power account for nearly 20% of total value (US\$1.8bn each).











Governments own 75% of projects, while Canada, China, Nigeria, Switzerland and the US each own 5%. This is in contrast to the funding of projects, with Governments in Central Africa only financing 5% of projects. China is the largest funder, financing 35% of projects followed by International DFIs at 20%. Private Domestic firms are responsible for financing 10% of projects while African DFIs finance 5%. The remaining 25% of projects in Central Africa are financed by various single countries.

China remains the most important player in the construction sector, building half of all projects in the region. Private Domestic firms are responsible for the construction of 15% of regional projects, followed by France with 10%. Single countries including Equatorial Guinea, South Africa, Switzerland, Turkey and US each construct 5% of projects.

As a region, Central Africa has the largest share of new projects. Ongoing projects account for only 60% of the projects currently underway in comparison to last year. In addition, five of Central Africa's 10 largest projects are new projects, including the two largest projects; the DRC's Kamoakakula Copper Project worth US\$1.5bn and the Sonara Expansion Project in Cameroon valued at US\$1.3bn.

In 2016, Central Africa had no projects worth over US\$1bn. Central Africa's ten largest projects represent 75.7% of the region's total project value. Cameroon's Memve'ele Hydropower Station is expected to be completed by the end of 2017.

### Top 10 projects (by value)

Country	Project		Sector	US\$bn
<b>DRC</b>	Kamoakakula Copper Project		Mining	1.5
<b>Cameroon</b>	Sonara Expansion Project		Real Estate	1.3
<b>DRC</b>	Katanga Copper Mine		Mining	0.8
<b>Cameroon</b>	Limbe Deep Sea Port		Shipping & Ports	0.7
<b>Cameroon</b>	Kribi Deep Sea Port		Shipping & Ports	0.7
<b>Gabon</b>	Libreville - Port-Gentil Road Project		Transport	0.6
<b>Cameroon</b>	Memve'ele Hydropower Station		Energy & Power	0.6
<b>Cameroon</b>	Lom Pangar Dam and Hydropower Project		Energy & Power	0.5
<b>Cameroon</b>	Kribi-Lolabe Double Carriage Road Project		Transport	0.5
<b>Congo-Brazzaville</b>	Denis Sassou Nguesso University		Education	0.4

Source: Deloitte analysis, 2017

# West Africa

	2013	2014	2015	2016	2017	2017% of continental projects
<b>Projects</b>	66	66	79	92	79	26.1%
<b>Value (US\$bn)</b>	49.8	74.8	116.2	119.8	98.3	32%



West Africa has 79 projects currently underway, with a committed value of US\$98.3bn. The region accounts for 26.1% of all projects in Africa and 32% of the total project dollar value. West Africa includes Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

Between 2016 and 2017, the number of projects in West Africa decreased by 14.1% while the value decreased by 17.9%. This is due to the suspension and completion of some of the region's largest projects in the last year, such as the continued suspension of Simandou Iron Ore Project in Guinea and the 2017 suspension of Centenary City in Nigeria due to land issues.













The Block Deepwater Tano Oil & Gas project in Ghana reached completion and

started production in 2017, and so was not included in the list of projects for this year. Together, these three projects alone were valued at US\$43.5bn of last year's projects. A total of 26 new projects worth US\$29bn (or 28.5% of total project value), were included in this year's edition, including 11 new Transport projects.

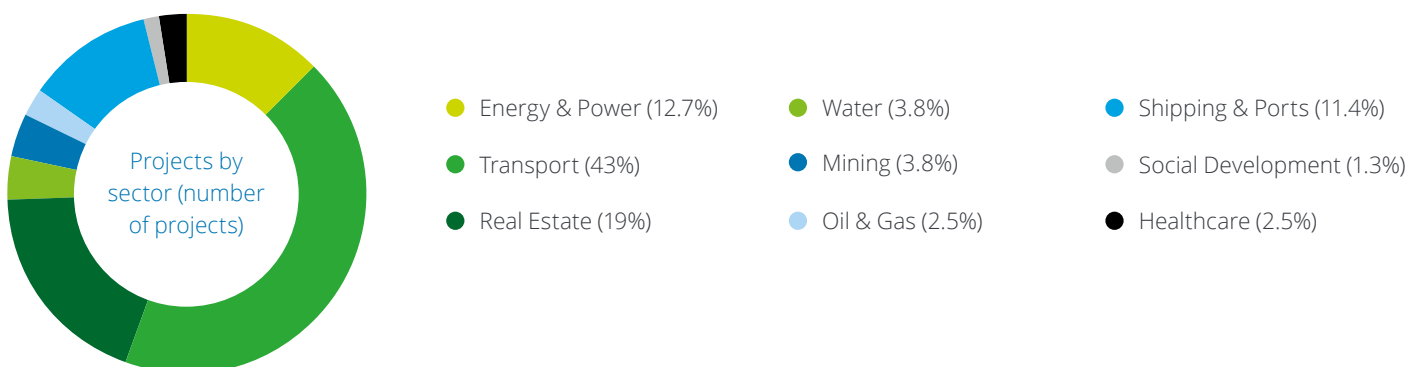
With 30 projects, Nigeria continues to be home to the greatest number of projects in West Africa (38% of the regional total), valued at US\$69bn (70.3% in US dollar

value terms). Nigeria is followed by Ghana with 14 projects (17.7% of the regional value) and Senegal with 13 projects (16.5%). These three countries account for just over 70% of all projects in West Africa and 91.1% of the region's projects in terms of US dollar value.

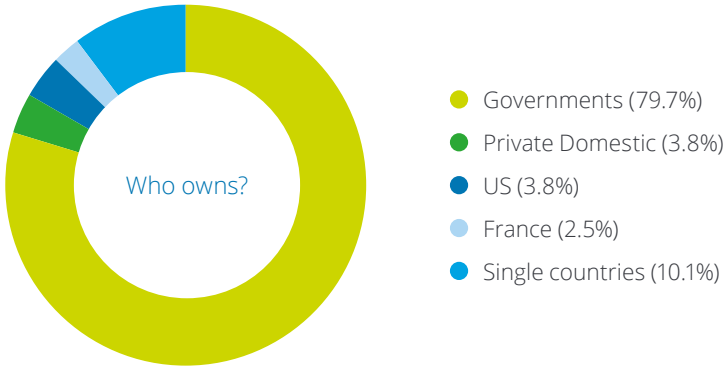


Projects by sector	2013%	2014%	2015%	2016%	2017%
 <b>Energy &amp; Power</b>	24	21	23	18	13
 <b>Transport</b>	23	29	30	34	43
 <b>Real Estate</b>	4	8	8	22	19
 <b>Water</b>	5	12	10	2	4
 <b>Mining</b>	20	14	9	2	4
 <b>Oil &amp; Gas</b>	/	/	14	3	3
 <b>Shipping &amp; Ports</b>	/	/	/	12	11
 <b>Social Development</b>	/	/	4	1	1
 <b>TMT</b>	/	1	/	/	/
 <b>Healthcare</b>	5	3	2	3	3
 <b>Education</b>	/	/	/	2	/
 <b>Mixed Use</b>	/	2	/	/	/
 <b>Other</b>	19	10	/	/	/

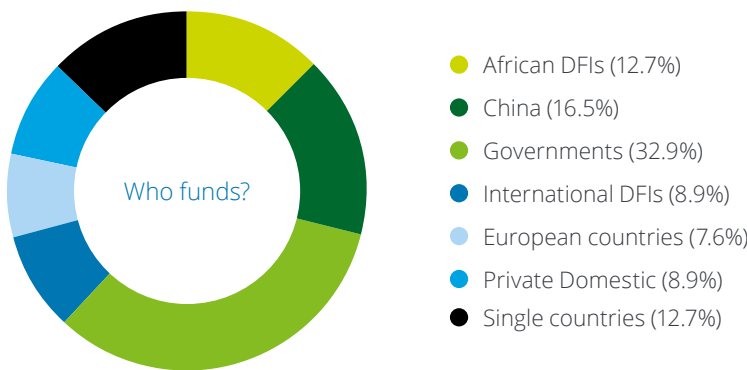
Source: Deloitte analysis, 2017. May not total 100% due to rounding



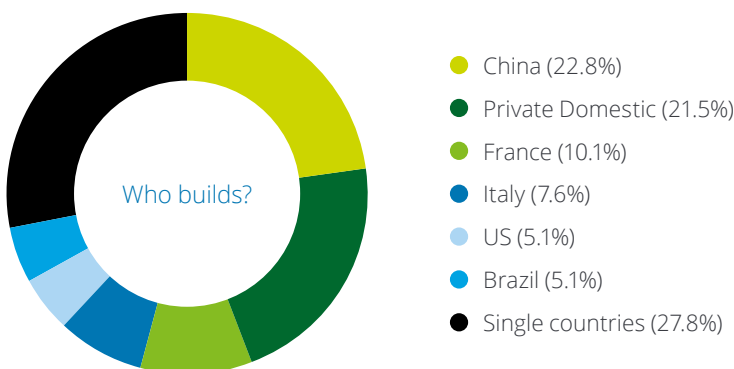
Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017. Single countries include Australia, China, Italy, Macau, the Netherlands, Nigeria, Turkey, and the UK



Source: Deloitte analysis, 2017. Single countries include Australia, Brazil, Kuwait, Macau, Nigeria, South Africa, Turkey, and the US. European countries include France, Italy, the Netherlands, Switzerland, and the UK



Source: Deloitte analysis, 2017. Single countries include Australia, Belgium, Egypt, Germany, India, Macau, Malaysia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Tunisia, Turkey, and the UK

The Transport sector continues to have the largest number of projects in West Africa, with 34 projects, representing 43% of total projects. Nigeria is continuing with large Transport projects with various Road & Bridge and Rail projects. The majority of Transport projects are Road & Bridge projects of which eight projects are new.

Half of the new Road & Bridge projects are in Nigeria while the remaining four are in the Gambia, Ghana, Senegal and Sierra Leone. Rail projects are the most valuable new projects, worth almost US\$10bn, of which US\$9.1bn worth are in Nigeria. Real Estate and Energy & Power projects continue to be the second and third largest sectors in the region, with 15 and 10 projects respectively.

Projects in West Africa are predominantly owned by Governments, owning 79.9% of projects. This is followed quite far behind by Private Domestic firms and the US, each with 3.8% and then France with 2.5%. Various single countries own the remaining 10.1% of projects in the region.

Governments also fund the majority of projects in the region, funding 32.9% of projects. However, the financing of projects is more evenly distributed than ownership. China has picked up its share of project funding, from 10.9% to 16.5% of projects in the region this year. African DFIs have become more prominent too, financing 12.7% of projects. Both International DFIs and Private Domestic firms fund 8.9% of projects.

Chinese contractors have overtaken Private Domestic firms as the dominant builders in West Africa, with 22.8% and 21.5% of projects respectively. French firms build 10.1% of projects and Italian firms are responsible for 7.6% of all projects. Italian firms are becoming more prominent in the Transport space. Brazilian and US contractors are each responsible for 5.1% of projects.











West Africa's 10 largest projects by value account for 67.7% of the region's total project value. The Egina Gas Field in Nigeria is the largest project in West Africa, valued at US\$15bn while the US\$12bn Olokola Deepsea Port, also in Nigeria, is the second largest. Shipping & Ports and Transport projects dominate the top 10, with three projects each. In terms of value, the Oil &

Gas sector dominates the top 10 projects, worth a combined US\$22bn.

The Block Offshore Cape Three Points Project in Ghana started production in July 2017 while the Egina Gas Field is expected to come online in 2018. Nigeria is home to eight of the largest projects, while Ghana accounts for the remaining two.

Two of the three new projects on the top 10 list are in Nigeria, namely the Lagos - Kano Rail Project and the Eko Atlantic Real Estate Project. The US\$4bn Ada Estuary Tidal Power Plant in Ghana completes the new additions to the top 10 projects in West Africa.

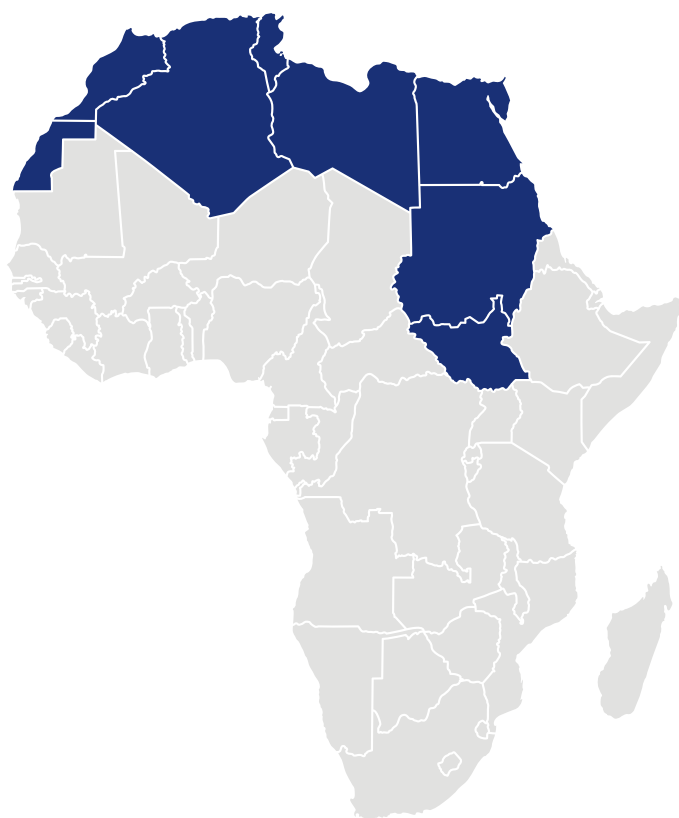
### Top 10 projects (by value)

Country	Project		Sector	US\$bn
Nigeria	Egina Gas Field		Oil & Gas	15
Nigeria	Olokola Deep-sea Port		Shipping & Ports	12
Nigeria	Lagos - Kano Rail Project		Transport	8.3
Ghana	Block Offshore Cape Three Points		Oil & Gas	7
Nigeria	Eko Atlantic		Real Estate	6
Nigeria	Lagos Free Trade Zone Port		Shipping & Ports	6
Ghana	Ada Estuary Tidal Power Plant		Energy & Power	4
Nigeria	Calabar-Katsina-Ala Super Highway Project		Transport	3
Nigeria	Onne Port Complex		Shipping & Ports	2.8
Nigeria	Lagos Light Mass Rail Transit		Transport	2.4

Source: Deloitte analysis, 2017

# North Africa

	2013	2014	2015	2016	2017	2017% of continental projects
<b>Projects</b>	22	8	29	42	40	13.2%
<b>Value (US\$bn)</b>	6.7	9.1	25.8	76.1	77.1	25.1%











North Africa features 40 projects, valued at US\$77.1bn. The region represents 13.2% of all projects on the continent and is the recipient of 25.1% in US dollar terms for its share of projects tracked.

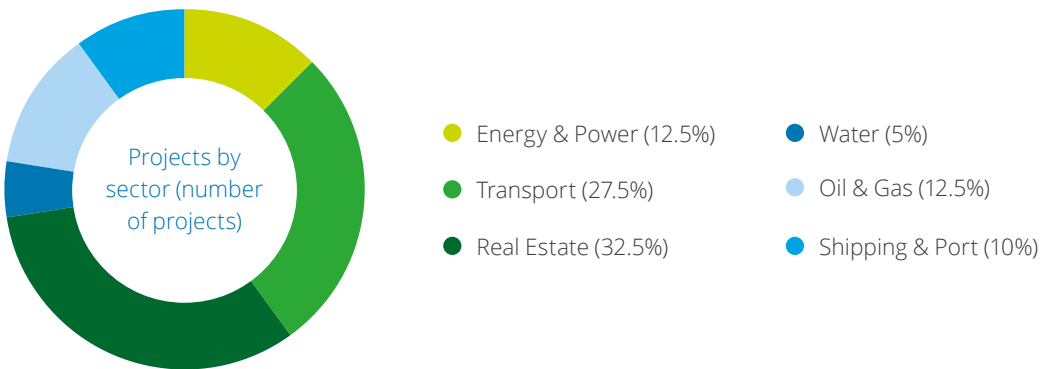
North Africa includes Algeria, Egypt, Libya, Morocco, South Sudan, Sudan, Tunisia and Western Sahara. In terms of the number of projects, Egypt has the most with 17 projects, followed by Algeria with 12 and Morocco with eight. The number of projects in North Africa decreased by 4.8% from 42 in 2016 to 40 this year, while the value of projects rose by 1.3%.

In contrast to recent years, the number of Real Estate projects in Northern Africa have overtaken Transport projects, with the former making up 32.5% and the latter 27.5% of projects respectively. Real Estate is dominated by Commercial Real Estate (rather than Industrial Real Estate) in terms of both US dollar value and the number of projects.

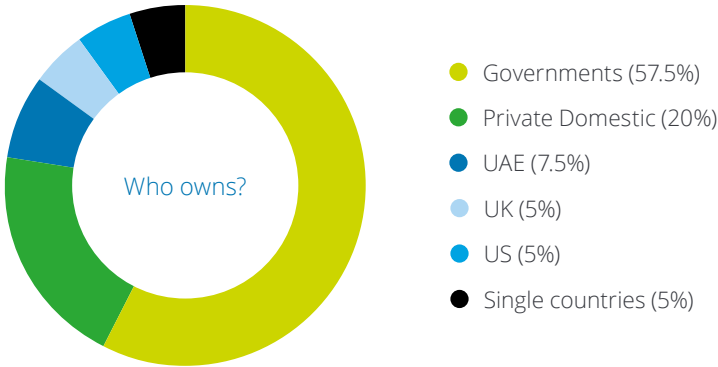
Egypt is home to eight of the 10 Commercial Real Estate projects, with the other two projects situated in Morocco. One new Commercial Real Estate project was started in Morocco while a new Industrial Real Estate project began in Algeria.

Projects by sector	2013%	2014%	2015%	2016%	2017%
 <b>Energy &amp; Power</b>	59	75	28	10	12
 <b>Transport</b>	14	25	41	43	28
 <b>Real Estate</b>	14	/	7	26	33
 <b>Water</b>	/	/	7	5	5
 <b>Oil &amp; Gas</b>	/	/	8	12	12
 <b>Shipping &amp; Ports</b>	/	/	3	5	10
 <b>Social Development</b>	/	/	3	/	/
 <b>Other</b>	13	/	3	/	/

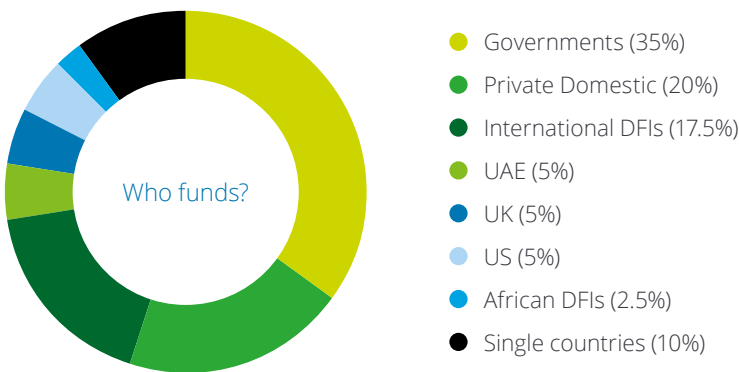
Source: Deloitte analysis, 2017. May not total to 100% due to rounding



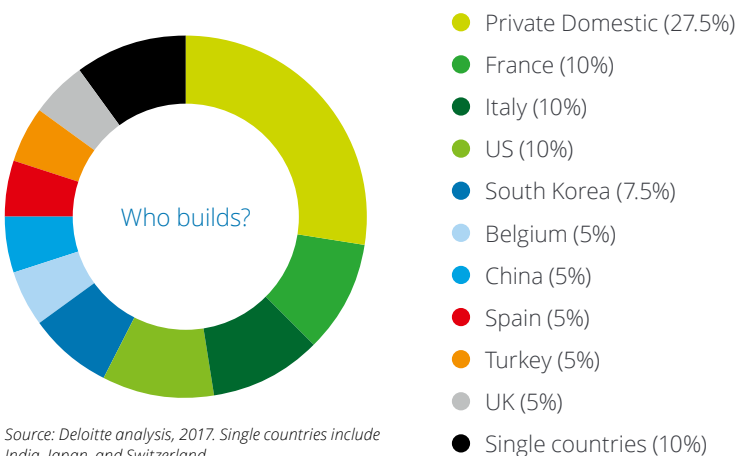
Source: Deloitte analysis, 2017



Source: Deloitte analysis, 2017. Single countries include Germany, and Italy



Source: Deloitte analysis, 2017. Single countries include China, Germany, Italy, and Qatar



Source: Deloitte analysis, 2017. Single countries include India, Japan, and Switzerland

The number of Transport projects in North Africa decreased from 18 projects (42.9%) in 2016 to 11 projects in 2017. This is due to the completion of seven Transport projects, with no new large-scale transport projects beginning construction between 2016 and 2017.

Oil & Gas and Energy & Power both account for 12.5% of projects. The number of Oil & Gas projects remained the same as in 2016 and a new solar Energy & Power project began construction in Egypt. Shipping & Ports represent 10% of projects with two new projects, including the US\$3.3bn El Hamdania Sea Port in Algeria. Water projects make up the remaining 5%.

Although there are only five Oil & Gas projects in North Africa, the sector represents 41.2% of all projects in US dollar terms, followed by Transport (29% of total regional value). Within the Transport sector, Rail continues to be particularly well represented with eight projects (mostly in Algeria), worth US\$11.7bn (15.1% of total regional value), but closely followed by the two large Road projects in Algeria and Libya, with a total value of US\$10.2bn, representing 13.3% of regional project value.

Although Governments continue to own the largest share of projects with 57.5% of projects, Private Domestic ownership has increased from 14.3% in 2016 to 20% in 2017.

The United Arab Emirates (UAE) continues to be represented in terms of ownership of projects, owning 7.5% of projects in the region while the UK and the US both own two projects (equivalent to 5% each). Germany and Italy, with one project each, own the remaining 5%.

Governments are the largest funders of infrastructure projects in the region (35%). Private Domestic entities fund 20% of projects and International DFIs fund 17.5%. The UAE, the UK and the US each fund two projects (5% each). African DFIs funded only one of the projects featured (2.5%). A range of countries funded the remaining 10% of projects.

Private Domestic companies are well represented in terms of who builds projects, constructing 27.5% of projects. Egyptian construction companies are the most visible Private Domestic firms, building eight of the 11 Private Domestic-constructed projects in North Africa.

Companies from France, Italy and the US each built 10% of projects in North Africa, and firms from South Korea were responsible for the construction of 7.5% of projects. Companies from Belgium, China, Spain, Turkey and the UK each built 5% of projects.

The two largest projects in North Africa are both Oil & Gas projects in Egypt. The Shorouk Concession has a price tag of US\$14bn and is slated to start production in 2017. The West Nile Delta Project is valued at US\$12bn and is expected to be fully on stream in 2019. The El Hamdania Sea Port in Algeria, costing US\$3.3bn, is the only new addition to the top 10 list from 2016.

Algeria is the best represented country in terms of the 10 largest projects, with four projects, followed by Egypt with three and Morocco with two. Both the Oil & Gas

sector and the Transport sector are well represented with three projects each in the top 10. Egypt's Mostorod Refinery Upgrade Project is expected to be completed in the beginning of 2018.

This year again, the top 10 largest projects account for almost three quarters (74.1%) of the total US dollar value of projects in North Africa, indicating a concentration of projects. With a number of projects expected to reach completion within the next few months, North Africa's top 10 projects should see a number of changes in the next edition of this report.

### Top 10 projects (by value)

Country	Project		Sector	US\$bn
<b>Egypt</b>	Shorouk Concession		Oil & Gas	14
<b>Egypt</b>	West Nile Delta Project		Oil & Gas	12
<b>Algeria</b>	Hauts-Plateaux Motorway		Transport	8.9
<b>Morocco</b>	Tangier - Casablanca Rail		Transport	4.1
<b>Egypt</b>	Mostorod Refinery Upgrade Project		Real Estate	3.7
<b>Algeria</b>	El Hamdania Sea Port		Shipping & Ports	3.3
<b>Algeria</b>	Reggane North Development Project		Oil & Gas	3
<b>Tunisia</b>	Reseau Ferroviaire Rapide Project		Transport	2.8
<b>Algeria</b>	Various Gas Power Projects		Energy & Power	2.7
<b>Morocco</b>	Safi Supercritical Coal-Fired Power Plant		Energy & Power	2.6

Source: Deloitte analysis, 2017





# Keeping Projects on Budget and on Time – Managing Capital Project Decisions

## Venturing off track – project budget and time overruns

### Global project delays

The number of major capital projects that are either over budget, late or both, is alarming. Nine out of 10 global megaprojects (projects with a value of at least US\$1bn) experience cost overruns.<sup>5</sup> Although average overrun estimations vary greatly, some studies suggest that this could be as high as

70% for cost overruns and 183% for time overruns.<sup>6</sup> Cost overruns also differ by sector. For example, estimates of overruns are equivalent to 45% for rail projects, 34% for bridge projects and 20% for road projects.<sup>7</sup>

The table below shows some selected well-known global projects. The extent

of budget overruns is extensive and the large projects that were on time, had non-negotiable deadlines. Even more concerning is that these delays or cost overruns on capital projects are not isolated and affect projects of all sizes.

### Select global project budget & time overruns

Project name	% Over budget	% Time over deadline
International Space Station	186%	86%
Sochi Olympics	325%	0%
The Channel Tunnel	145%	14%
Three Gorges Dam	163%	-20%
Boston Big Dig	421%	129%
London Olympics	265%	0%
Athens Olympics	95%	0%
Jubilee Line Extension	84%	50%
Hubble Space Telescope	525%	140%
Denver International Airport	167%	50%

Source: Podio, not dated<sup>8,9</sup>

### African project delays

Approximately only 20% of projects (from inception) in Africa reach financial closure and are able to move to execution.<sup>10</sup>

Countries with stronger regulatory and institutional governance frameworks tend to have a lower risk of project overruns.

Emerging markets, with weaker governance institutions, tend to have significant time and cost overruns. In Malaysia, for example, approximately only 21% of public sector projects and 33% of private sector projects are completed within the stipulated time while 60% of projects in India suffer time overruns.<sup>11</sup> Unfortunately, no known public

data for the average cost and time overrun exists for projects in Africa. However drawing on secondary literature, these delays echo for projects across territories and sectors on the continent.

For example, it is estimated that **Nigeria's** transport infrastructure projects cost on average 14% more than the initial cost estimates and take approximately 188% longer to complete.<sup>12</sup> Seven out of ten projects in Nigeria are delayed.<sup>13</sup> The major causes of delay in Nigeria are improper planning and a lack of access to funds to finance projects to completion, lack of effective communication leading

to inaccurate estimates and slow-decision making.<sup>14</sup>

**South Africa's** role as host of the 2010 FIFA Soccer World Cup resulted in the construction or upgrading of 10 soccer stadiums as well as other transport infrastructure upgrades. Although all 10 of the stadiums were completed on time for the tournament, almost all projects incurred significant cost overruns and time delays. Altogether, the stadiums were US\$267m over budget. This was due to a lack of communication, slow decision-making and the late issue of instructions.<sup>15</sup>

Project name	% Over budget
Soccer City Stadium	174%
Green Point Stadium	483%
Moses Mabhida Stadium	267%

Source: Khabisi, 2013

In South Africa's capital city, Tshwane, all of the road and stormwater projects completed between 2006 and 2010, experienced delays. Road and stormwater projects saw an average time delay of 67% compared to the original contract time. This was largely the result of insufficient production rates, lack of services planning and weather delays.<sup>16</sup>

In **Ghana**, research has shown that 75% of groundwater projects completed between 1970 and 1999 experienced both time and cost overruns. Therefore, only 25% of groundwater projects were completed on time and within budget.<sup>17</sup> The delays and cost escalations were caused by monthly payment difficulties resulting from bureaucracy, poor contract management, problems with material procurement due to excessive processing times, lack of technical skills and an escalation in the price of materials due to currency fluctuations. There is very little investment

from the private sector in Ghana's groundwater industry and therefore all projects were Government owned.<sup>18</sup>

Cost and time overruns have been identified as playing a significant role in the abandonment of projects and in project failure in **Kenya**. Approximately 48% of projects report a cost overrun and 87% of projects have a time overrun.<sup>19</sup> This is largely attributed to inadequate initial contract periods that do not consider all factors resulting in time delays.

The Tanzam Highway plays an important role in facilitating neighbouring Zambia's import and export trade through the Dar es Salaam harbour in **Tanzania**. Construction on the rehabilitation of the highway was expected to start in April 1987. Construction was only completed in June 1995, resulting in a time delay of 50 months and a cost overrun of 54%.<sup>20</sup> The cause of the delay was attributed to the

depreciation of the currency, a rapid rise in inflation and a delay in payments because of government bureaucracy.

Tanzania's Songo Songo IPP gas project incurred cost overruns of nearly 50%, worth approximately US\$100m, due to a number of delays. Approximately US\$30m of the cost increase was the result of rising debt interest charges, because of the project delay.<sup>21</sup>

Some rather notorious project delays include the rehabilitation of Inga 1 and Inga 2 hydropower dams in the **DRC**, launched in 2002, which led to significant cost and time overruns. The cost overrun is estimated to have reached 340% due to numerous reported project mismanagement and delays in execution. The project was due to be completed by 2009, but by 2016, the dams were only able to operate at about 40% of their proposed capacity.<sup>22</sup>

Similarly in **Nigeria**, the Ajaokuta Steel Plant was due to be commissioned in September 1979, however, nearly 40 years later the plant had not yet started production. Construction on the project finally stopped in 1994, with an estimated completion rate of 98%. The Nigerian Government has supposedly spent US\$9bn on the project. In recent years, a number of companies and the Nigerian Government have expressed interest in restarting the project, which will cost an estimated US\$400m.<sup>23</sup>

### African projects getting it right

In **Egypt**, the construction of the New Suez Canal was completed in one year, a third of the time initially estimated. The US\$8.5bn expansion will nearly double the canal's capacity from 49 to 97 ships per day by 2023 and allow for faster two-way traffic while also reducing wait times for one of the world's busiest shipping channels.<sup>24</sup> The canal was financed in only six days by offering interest bonds (at 12%) to the Egyptian public.<sup>25</sup> The canal was also a priority for the Government and the military was employed to assist with construction.

As part of its second Growth and Transformation Plan (GTP II), the Government of **Ethiopia** is aiming to open 44 public universities by 2021. The new universities would need to be built cost-effectively and quickly to be able to serve Ethiopia's rapidly growing student market. As local management skills were lacking, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) was brought on board to run the project on behalf of the Ministry of Education between 2006 and 2012. Thirteen new universities were built within five years and costs were reduced by 48% by reducing waste, using prefabricated components and state-of-the-art technology, increasing Ethiopia's student teaching capacity fourfold.<sup>26</sup>

### Delays on Africa's top 20 construction projects

As noted, while overruns are not limited to megaprojects both globally and in Africa, the probability of a project experiencing time and cost overruns increases as the size and complexity of projects increase.<sup>27</sup> With this in mind, the 20 largest African projects tracked in this report are worth US\$155.9bn, and account for half of the

value of the total 303 projects tracked.

At the time of writing, only seven of Africa's top 20 projects under construction are likely to be completed on time. The only new project in the group of on-time projects is the Coral South Floating LNG Facility in Mozambique. Approximately two out of three projects (65%) are delayed.

Projects are considered to be delayed if either the start of construction or the completion of construction is delayed. Government-owned projects are the worst offenders, with 83.3% of projects delayed. Three-quarters of Private-owned projects are on time. This shows a consistent pattern of overruns compared to global projects.

Both Shipping & Ports projects in the top 20 projects are delayed and 80% of Energy & Power projects are delayed. Three quarters of Transport projects are delayed while 66.7% of both Real Estate and Oil & Gas projects are delayed.

## Top 20 African construction projects tracked

Type of project	% On time	% Delayed
PPP	50%	50%
Private	75%	25%
Public	16.7%	83.3%
<b>Total</b>	<b>35%</b>	<b>65%</b>

Source: Deloitte analysis, 2017

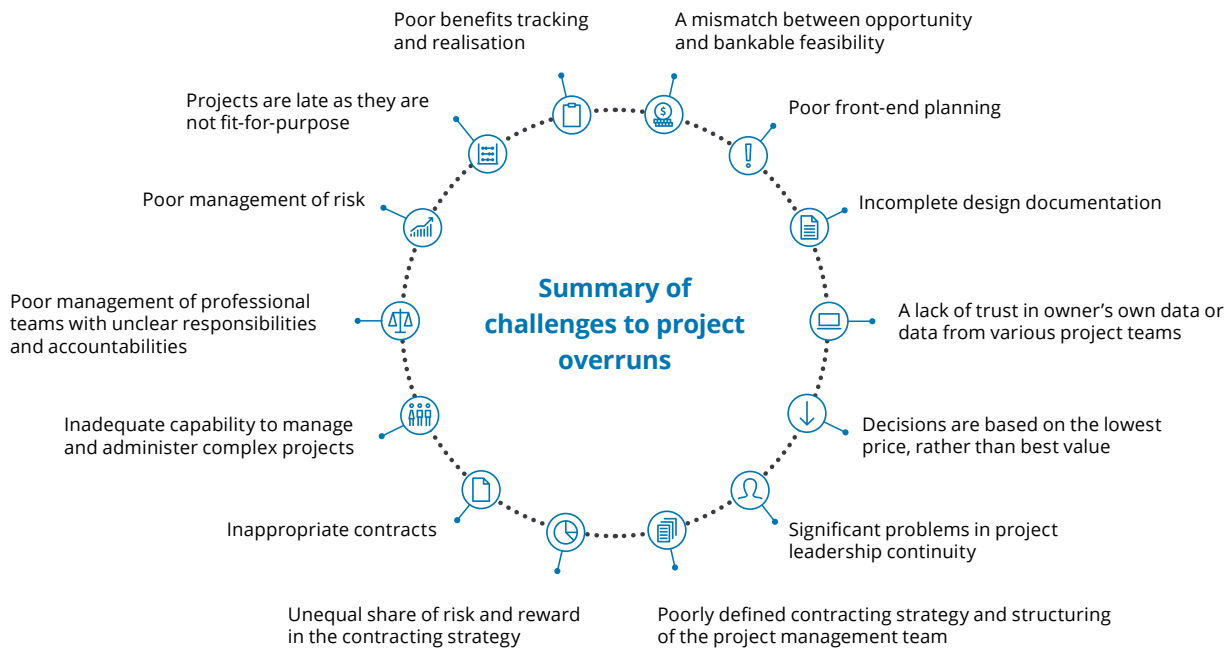
# An owner's perspective to effective capital project decisions

Probably the most important value driver is cost. Project owners typically would want to understand the cost of a project, as this is linked to either funding, a budget or a board mandate. There is often the perception that the cost overrun on major capital projects is someone else's problem. From a capital project owner's perspective, key project decisions are often not informed by the real value drivers of projects.

Owners would typically respond by indicating that the problem of a cost overrun should be managed either by the professional team or that the contractor should carry the risk. Owners do understand that project delays affect time, but seldom are time and cost linked in making key decisions. If asked, many capital project owners would respond that they are in control of the projects.

## The challenges to project overruns

While a great deal of research has been done on why capital projects run into delays and cost overruns, what is interesting is that despite this wealth of knowledge a substantial share of projects still experience these challenges. In discussions with capital project owners, some key themes emerge as to why these challenges are experienced in the first place. These include:



## Understanding the real value drivers of projects

Owners need to implement a deeper understanding of the time value of money and the real value drivers of capital projects. It is alarming how often owners make decisions that are not aligned to the real drivers of value. Understanding the real value drivers ensure more predictability for the desired project outcomes of being both on time and within budget.

Project delays are often blamed on the contractor. Yet it often starts with the owner wasting an inordinate amount of time until the point when ground is broken and construction starts.

Although each project and type differs, poor projects could sometimes consume more than 50% of the time (through to when the project needs to be completed and operational) on elements such

as Strategy & Planning, Finance & Procurement, Design & Project Execution, and Construction. This leaves very little time for the contractor to execute on the project and the project comes under immediate pressure.

The result is often a disgruntled contractor, large claims, a cost overrun and an unhappy owner or client.

In well-managed projects, a larger percentage of the time is allocated to detailed engineering and actual construction, ensuring that a fit for purpose asset is delivered timeously.

Two key points come from this analysis. Firstly, project owners that take a long time during the project start-up, place pressure

on their projects, which results in time delays and often more costs. This does not imply that front-end engineering and design must be compromised in any way.

The second point from this is that when the completed asset is delivered late, the owner either cannot derive rental income from it or planned production/

revenue generation cannot take place. Hence the time value for money is not well understood.

In addressing these issues, the real value drivers of projects, is what owners should be focusing on. The table below shows some examples, and is by no means a complete list.

Capital project value chain	Typical owner focus	Real value drivers focus
<b>Strategy &amp; Planning</b>	<ul style="list-style-type: none"> <li>• Tweaking the business case to make it work</li> <li>• Lengthy internal approval processes</li> <li>• No consideration of benchmarks in estimates</li> </ul>	<ul style="list-style-type: none"> <li>• Clear scope definition</li> <li>• Structuring the project leadership team</li> <li>• Independent reviews/assurance/value engineering</li> <li>• Early external approvals/stakeholder engagement</li> </ul>
<b>Finance &amp; Procure</b>	<ul style="list-style-type: none"> <li>• Reducing fees of professional team</li> <li>• Seeking lowest price</li> <li>• Capital project estimates that meet expectations</li> <li>• Bespoke contracts</li> </ul>	<ul style="list-style-type: none"> <li>• Robust assumptions based on value drivers</li> <li>• Time as a key value driver</li> <li>• Clear contracting strategy (both delivery and pricing)</li> <li>• Adequate risk and contingency</li> </ul>
<b>Design &amp; Project Execution</b>	<ul style="list-style-type: none"> <li>• Squeezed professional fees impacts timing and effectiveness of design &amp; information flow</li> <li>• Numerous changes to scope and late design changes</li> <li>• Limited upfront planning</li> </ul>	<ul style="list-style-type: none"> <li>• Clear scope definition and design parameters</li> <li>• Early and timeous design</li> <li>• Test for constructability/value engineering</li> <li>• Early project execution involvement</li> <li>• Detailed planning and project readiness</li> </ul>
<b>Construction</b>	<ul style="list-style-type: none"> <li>• Drive contractor for impossible deadlines</li> <li>• Micro manage to limit claims that end up as costly disputes</li> <li>• Milestones rather than quality</li> <li>• Blurring lines of accountability through owner actions</li> <li>• Paying the contractor late to “control” them</li> </ul>	<ul style="list-style-type: none"> <li>• Project culture and performance management</li> <li>• Managing risk and effective integration</li> <li>• Integration planning and scheduling</li> <li>• Competency and quality of teams</li> <li>• Productivity and trends</li> </ul>

Source: Deloitte industry insights, 2017

As the owner thinks of each of these typical owner actions, careful consideration should be given to the unintended consequences. By understanding the value drivers and desired project outcomes, an owner’s decision-making can be more deliberate and aligned to sustainable value for all stakeholders. Too often decisions are made on the fly or at the whim of a senior leader.

**Key takeaways for capital project owners**

A few points emerge from the issues raised

above. First, capital projects are often developed in silos by different persons with no singular view of the project from an owner’s point of view. Second, there is a poor understanding of the real value drivers that typically leads to projects being delivered late and over-budget.

Third, there is a general lack of understanding of the role of the owner as the ‘Creator of Value’ and not just the administrator of a contract. Fourth, owners have limited skills to manage large capital projects effectively. Given these limitations,

owners tend to make key decisions that are in fact detrimental to effective and predictable capital project execution.

In conclusion, capital project owners need to step back and understand the real value drivers and the time value of money of their capital projects. Owners should then give strategic consideration to how to make more effective decisions on capital projects.



# Methodology

The annual Deloitte *Africa Construction Trends* report monitors progress on capital intensive infrastructure on the continent.

To qualify for inclusion, infrastructure construction projects are required to be valued at over US\$50m. For this year's edition, projects must have broken ground, but not yet been commissioned, as at 1 June 2017.

The analysis of construction trends focuses on projects that are physically under construction, with construction crews on-site at the annual cut-off date. The successive annual reports track the value of construction projects underway as at 1 June of each year, and the numbers should not be read as reflecting the total value of projects constructed during a 12-month period.

The total project value of a project is included each year, even if the project spans multiple years.

In this edition, we are able to draw comparisons across five years of data, both from a continental and regional perspective, drilling down into the sectoral, project ownership, project funder and project builder landscape.

Categorisation of regions covered in this report followed that of the African Development Bank. Data collected was limited to publicly available information and informed the Africa Construction Trends 2017 dataset. All project data is verified through the Deloitte Africa country-office network. All graphics displayed in this report, unless otherwise indicated, are based on this dataset.

# Endnotes

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