AFRICA REGIONAL SUMMARY

Located near the equator in central Africa, the Nyamuragira and Nyiragongo volcanoes are often obscured from satellite view by clouds. But on February 9, 2015, clear skies afforded an unobstructed view from space of two plumes venting from the volcanic duo in the Democratic Republic of the Congo.

OVERVIEW

Clean energy is making inroads in sub-Saharan Africa, with over $25bn deployed in renewables (excluding large hydro) by the second half of 2015. And in 2014, the region saw clean energy capacity almost double on the previous year. These technologies give developing countries the opportunity to build a different kind of energy system as they seek to address low electrification rates and high demand for new sources of power.

But progress has not been evenly spread across the 19 African countries featured in *Climatescope*. South Africa accounts for over $16bn of the region's clean energy investment tally, and Kenya a further $4bn. After Ethiopia, at $1.8bn, no other country has attracted more than $500m cumulatively. In addition, South Africa and Kenya have also had more success in squeezing out large projects than building broader pipelines of smaller ones. There are few countries with the frameworks in place for the latter, with Tanzania and Uganda leading the pack.

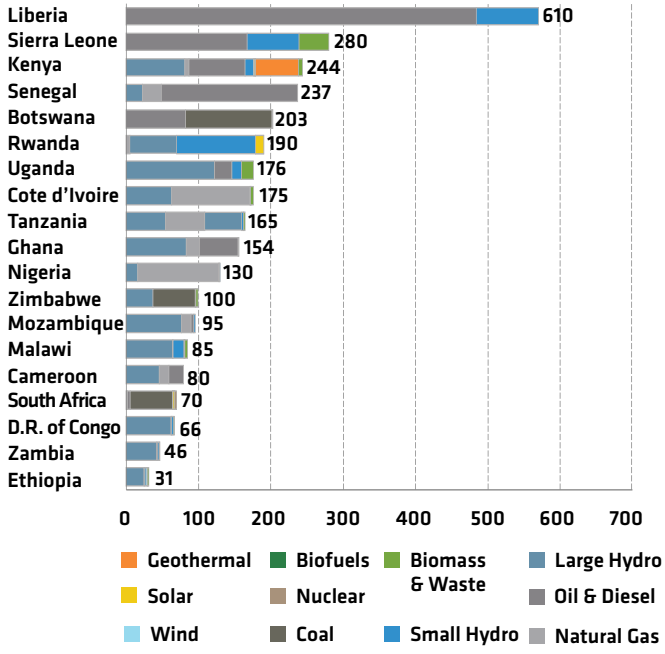
These trends are reflected in the *Climatescope* ranking this year. South Africa is again the out and out high flyer, with Kenya and Uganda keeping second and third places. Nigeria did rise up the rankings; but this had more to do with the large influence on investment and growth rates of a relatively small amount of financing in 2014 on a very low base than with progress on its policy framework – though its reform efforts do give it one of the most liberalized power sectors on the continent. Rwanda, Tanzania and Ethiopia follow next, in similar positions to last year. Beyond them, many countries struggle to score well, with policies and power sector reforms slow to materialize, and significant investment in clean energy even slower.

Notably, many of the *Climatescope* Africa scores did not increase, and in some cases actually decreased. South Africa's score of 1.91 was marginally lower than last year, reflecting delays in the financing of projects selected under the third round of its renewable auction program. After Nigeria's advance, Kenya clocked the next highest advance in score (from 1.69 to 1.74) partly related to the $860m financing of the Lake Turkana wind farm, sub-Saharan Africa's largest wind deal to date.

The biggest variations in scores between years were under Enabling Framework Parameter I and Clean Energy Investment Parameter II. There was very little movement for the African countries in terms of their value chains, under Parameter III, or carbon market activity under Parameter IV. This reflects the limited development of local value chains, and the slow growth of carbon offset projects.

Africa of course includes a wide range of development and power sector situations. This diversity is exemplified by stacking power prices against the technological make-up of the power systems. Liberia still has among the highest power prices in the world, and relies heavily on fossil fuel generation, while others – especially those with a high stock of large hydro such as Ethiopia, Zambia and the DRC – can have prices an order of magnitude lower.

AVERAGE RETAIL ELECTRICITY PRICES ($/MWh) BY POWER MIX, 2014

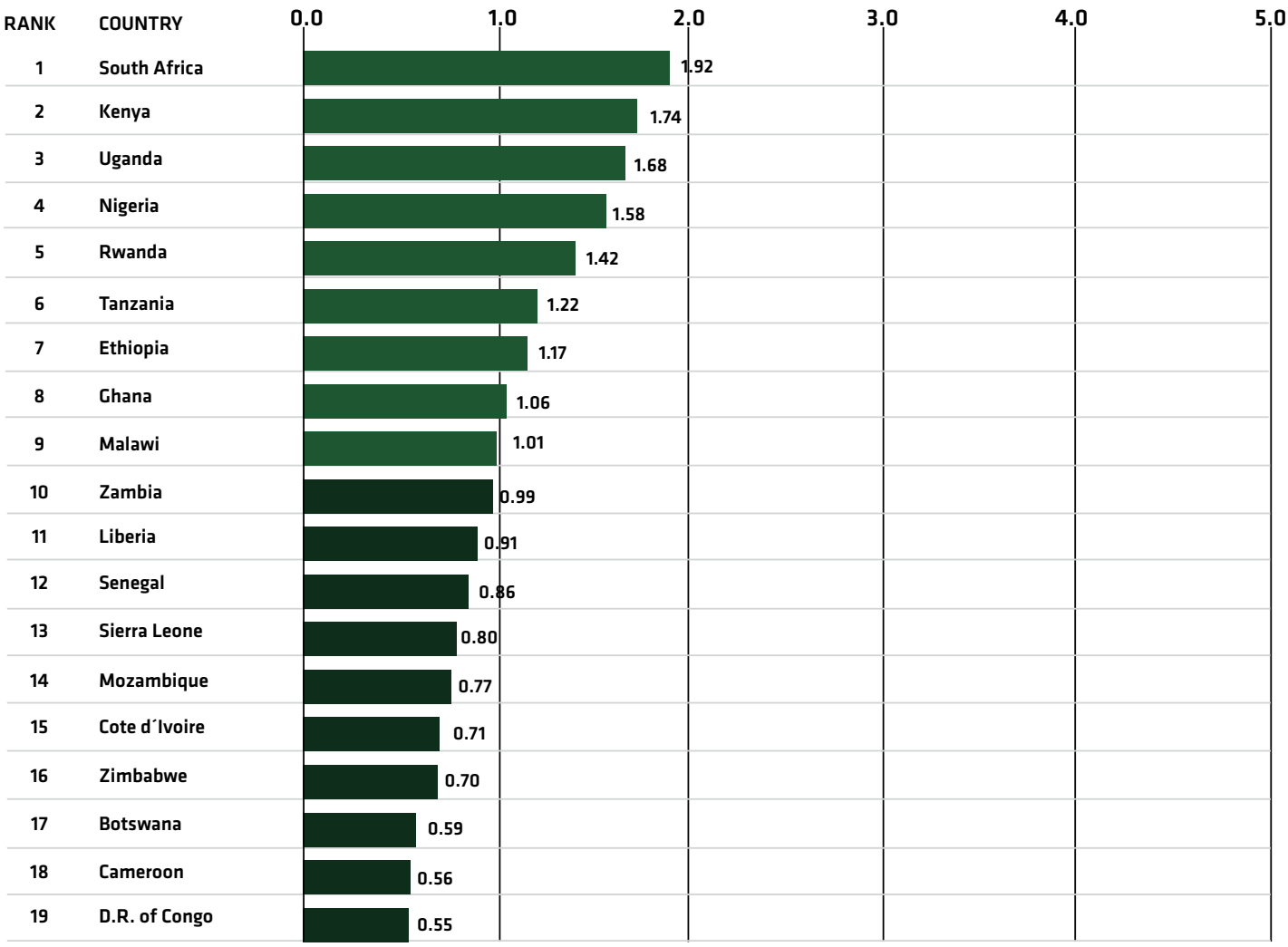


Source: Bloomberg New Energy Finance

Even with a low cost power source like large hydro, many governments artificially suppress power prices, leading to inefficient utilities and a barrier to entry for other players. Few have the stomach for the politically difficult task of raising them: only five *Climatescope* Africa countries have cost reflective tariffs. Despite increasingly favorable economics, large-scale solar development has yet to take off outside South Africa: Rwanda boasts the largest such project to date, at 8.5MW, one of the few successes of 2014. One reason is that feed-in tariffs – for instance in Ghana, Nigeria and, going as far back as 2008, in Kenya – have been slow to become operational or attract investors. Another is that governments and utilities have been slow to respond to new technologies and their reductions in cost. Another still is the low capacity of the grid for utility scale additions, and the perceived difficulty of managing their variable output.

This in turn presents an opportunity for off-grid clean energy technologies, especially small-scale solar coupled with battery storage. Pico solar lanterns with integrated phone chargers are now becoming commonplace, sold as low-cost consumer items in the millions. Entrepreneurs are scaling the services enabled by solar to include appliances made affordable through pay-as-you-go – with some already offering TVs and refrigerators to off-grid customers. Companies working at this level of the clean energy market in Africa have raised at least $250m to date, and we expect further investment and growth in this segment.

2015 Global Climatescope scores
Africa ranking



Colors show range for overall score

0.0 - 1.00 | 1.01 - 2.00 | 2.01 - 3.00 | 3.01 - 4.00 | 4.01 - 5.00

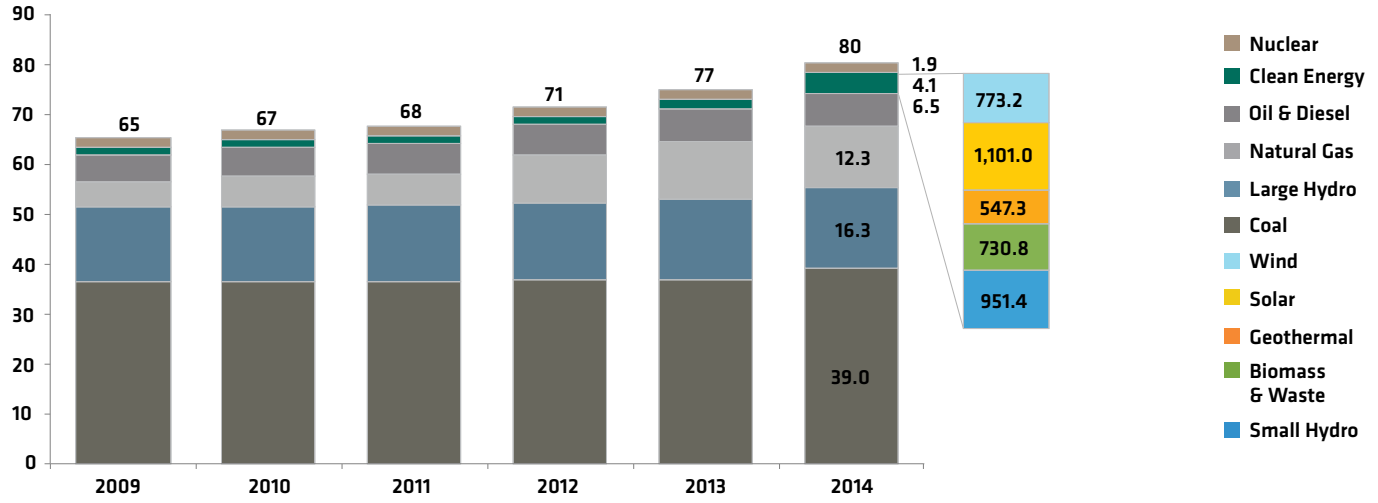
ENABLING FRAMEWORK PARAMETER I

Enabling Framework Parameter I does more than measure policies in place. It includes 22 indicators that account for a country's policy and regulatory frameworks, levels of clean energy penetration, level of price attractiveness for clean energy development, and the expectations for how large the market for clean energy can become.

For the second year running, Rwanda came out top for Parameter I. It scored highly on multiple indicators, including its high proportion of clean energy in its overall power generation capacity, while its policy framework attracted solid scores across its small-scale clean energy incentives and energy access policies. High power and fossil fuel prices are also credited as part of the enabling framework, as they signify opportunity for renewable alternatives.

In 2014, the *Climatescope* Africa countries as a whole nearly doubled their clean energy capacity, to 4.1GW from 2.1GW at the end of the previous year. This was predominantly through the addition of wind and solar capacity – with the latter accounting for 45% of the increase, and the two nearly 80% combined. This achievement should be put into some perspective – the unsunny UK added well over 2.1GW of just solar capacity in just the first quarter of 2015 in an end-of-subsidy rush – but it is an achievement to build on nonetheless.

AFRICA INSTALLED POWER CAPACITY BY SECTOR (GW) AND CLEAN ENERGY CAPACITY BY SECTOR (MW)



Source: Bloomberg New Energy Finance

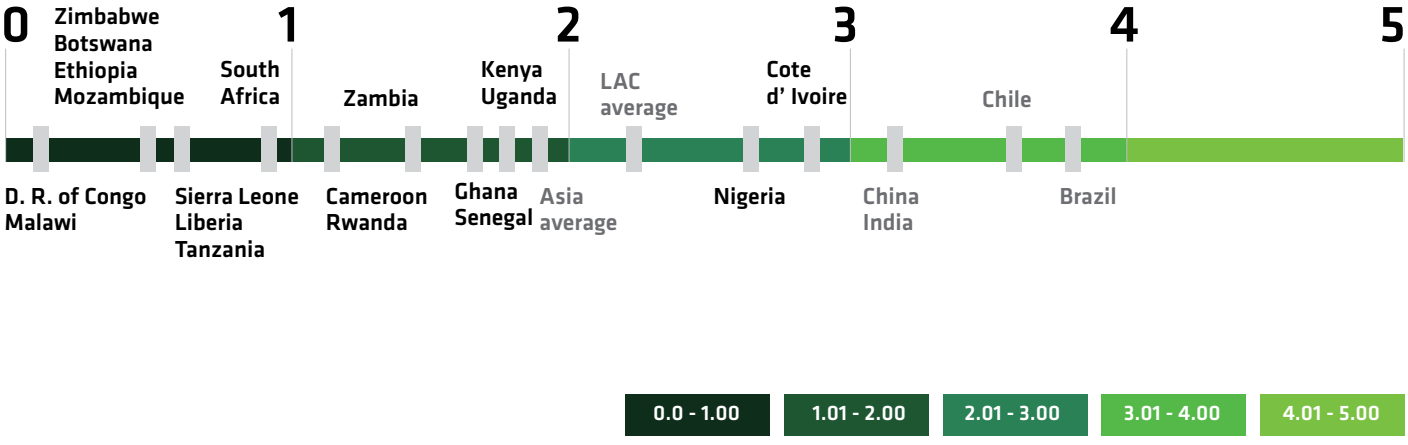
The new capacity was highly concentrated, however, with 73% built in South Africa. At the start of 2014, that country had 511MW of clean capacity, but that had climbed four-fold to 2GW by year-end. This was the result of the commissioning of projects selected in early rounds of its auction program. As a result, it scored higher in 2015 for the growth rates of its installed capacity and renewable electricity generation, which helped it climb to third among African nations on Parameter I, up eight places. Only Kenya and Ethiopia had significant renewable energy projects commissioned, with the former notably more than doubling its geothermal capacity with an expansion of nearly 300MW at the Olkaria project.

There was some progress for clean energy policy through 2014. Uganda ran the first tenders under its GET FiT program, and was credited by our panel of international policy experts for doing so, seeing its policy score improve more than any other *Climatescope* Africa nation. The success of that policy was echoed in its neighbor Tanzania, which augmented its small power producer program to introduce similar competitively-allocated FiTs in spring 2015. Mozambique also introduced a FiT in late 2014, with implementation through 2015.

South Africa, with its globally-significant REIPPP auctions, again took the highest policy score overall for Africa. At the other end of the scale, Botswana, the DRC and Sierra Leone again registered low scores for their scant policy environments. Complete descriptions of all of individual policies are available at www.global-climatescope.org.

There were no significant changes for power sector scores based on national reforms. Tanzania launched its reform process in 2014, with four stages that aim to see the national utility fully unbundled by 2025; its generation segment is slated to be split from transmission and distribution by the end of 2017. The DRC, which has the least open power sector among the Climatescope Africa countries, adopted a new electricity sector law in 2014, though the reforms have a long way to go in practice. Nigeria and Cote d'Ivoire again scored highest for power sector structure, reflecting the more advanced stages of sector liberalization in those countries. As with last year, it is notable that this has yet to translate into significant clean energy investment.

AFRICA POWER SECTOR SCORE BAROMETER



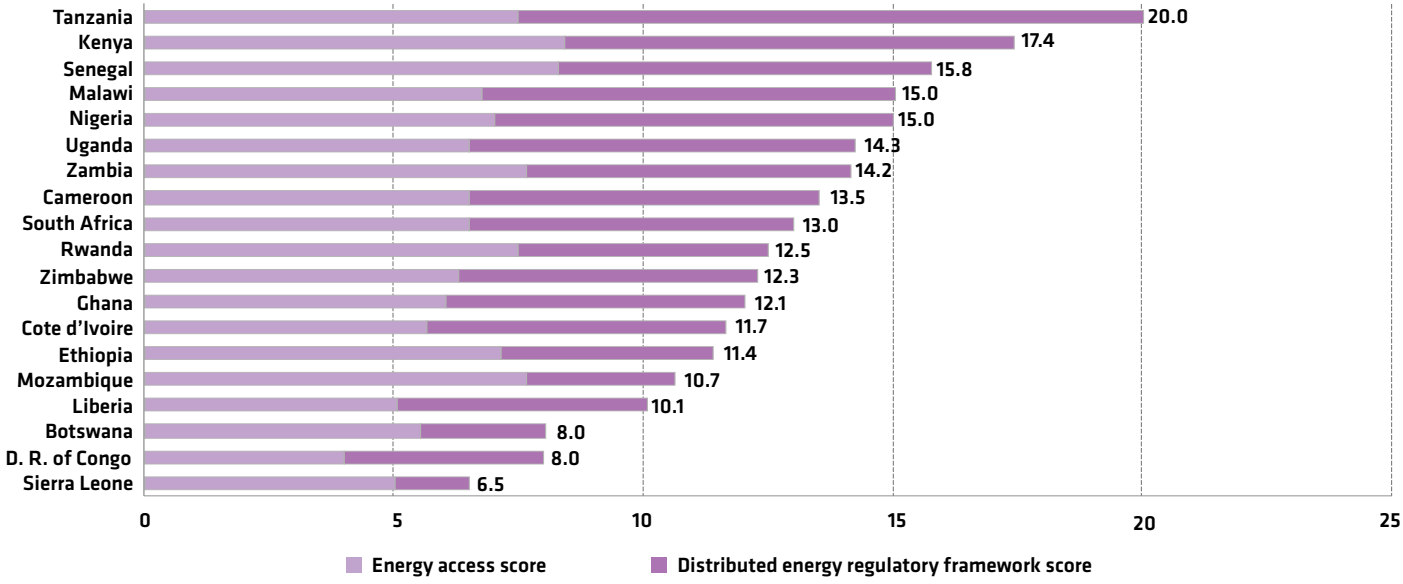
Source: Bloomberg New Energy Finance

Off grid focus enabling framework

For the enabling framework related to energy access, *Climatescope* assesses some of the key policy and regulatory questions around involving private investors, project developers and other companies in the off-grid and mini-grid sectors, as well as energy access policy, electrification rates and the size of the population using solid fuel for cooking.

As last year, Tanzania stands out for its policy-related off-grid focus score. The country's program for small and mini-grid power producers has continued to develop a pipeline of projects. Kenya follows, as last year, with standardized power purchase agreements also available for small projects there, while Uganda moves up, a reflection of its own innovative GET FiT program. East Africa clearly leads the way for tackling energy access through policy mechanisms.

DISTRIBUTED ENERGY AND ENERGY ACCESS SCORES



Source: Bloomberg New Energy Finance Note: Refer to the methodology section for more information about the components of the off-grid indicators.

CLEAN ENERGY INVESTMENT & CLIMATE FINANCING PARAMETER II

Clean Energy Investment & Climate Financing Parameter II looks at 14 indicators and accounts for the amount of clean energy investment a country attracts, the availability of local funds, the local cost of debt and green microfinance activity.

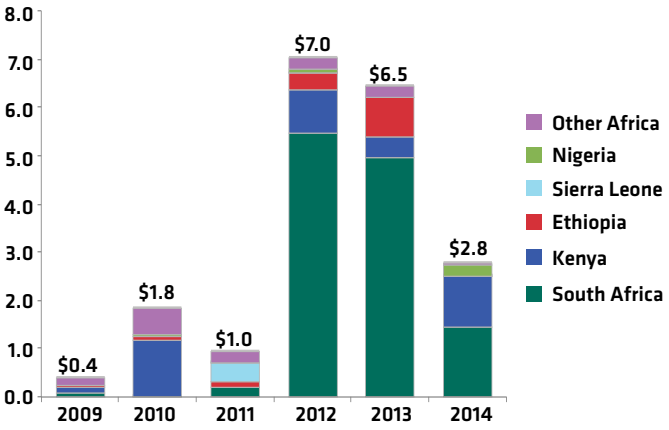
South Africa was again the leading African country for clean energy investment, followed by Kenya. But no other country came within touching distance for 2014. Overall, the continent saw a 57% drop from 2013 levels. This was largely due to delays in the financing of projects selected under the third round of South Africa's auction program – which was completed in the first half of 2015 to the tune of $3.6bn. The *Climatescope* Africa countries excluding South Africa saw their clean energy investment decline 10% overall year-on-year – but this was again very chunky, with large projects having a significant impact, rather than a more diverse deal flow of smaller projects.

In 2014, Kenya replaced Ethiopia as the country with the most significant financing outside of South Africa. The 310MW Lake Turkana wind project reached financial close in March 2014 after nine years of development. At $860m it remains sub-Saharan Africa's largest wind financing to date, and was one of the largest in the world in 2014. This helped push wind's share of total clean energy investment up to 38% in 2014 from 29% the previous year, while solar again took about half.

With 13 organizations involved in the financing, Turkana is a totemic achievement in project financing for the region. It overcame multiple setbacks, including the withdrawal of the World Bank, which was unable to give a partial risk guarantee as the government would not sign a sovereign guarantee. The lead developer, Aldwych International, is also seeking to develop a 100MW wind project in Tanzania.

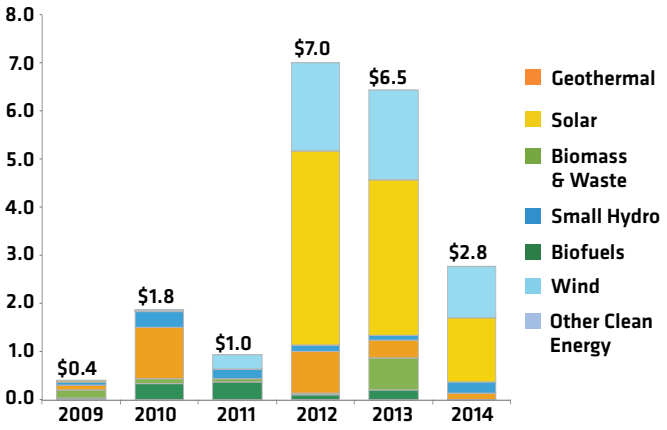
Overall, Nigeria came out top among the African countries for Parameter II. Its score was bolstered by the only other financing outside of Kenya and South Africa above a hundred million dollars in 2014, for 40MW of small hydro. As it had no significant deals the year before, Nigeria achieved maximum points for the growth rate of clean energy investment.

TOTAL INVESTMENT IN CLEAN ENERGY BY COUNTRY, 2009-2014 ($bn)



Source: Bloomberg New Energy Finance

TOTAL INVESTMENT IN CLEAN ENERGY BY SECTOR, 2009-2014 ($bn)



Source: Bloomberg New Energy Finance
Notes: Total investments includes: Asset Finance, Corporate Finance and Venture Capital / Private Equity Commitments.

Kenya climbed four places to finish second, largely thanks to the level of investment brought in by Turkana, while South Africa slipped from third to fifth. Their high finishes on Parameter II are also explained by relatively favorable financing conditions within both countries. Third place was instead taken by Rwanda, primarily from the uptick in investment from GigaWatt Global's solar project in early 2014. That project, which was fully commissioned in the first quarter of 2015, is at 8.5MW by far the largest solar farm in the region, outside South Africa.

LAKE TURKANA WIND PROJECT FINANCE ($m)

EQUITY		DEBT	
KP&P	46.4	European Investment Bank (EIB)	276.8
Aldwych	46.4	African Development Bank (AfDB)	152.2
EU Africa Infrastructure Fund	34.6	Proparco (French financial development company)	69.2
Norwegian Investment Fund for Developing Countries (Norfund)	23.5	Standard Bank	50.5
Vestas Wind Systems	23.5	Nedbank	50.5
Investment Fund for Developing Countries (IFU, Denmark)	19.9	KfW DEG (mezzanine)	27.7
Finnish Fund for Industrial Cooperation (Finnfund)	14.8	Unknown (mezzanine)	23.5
Total	209.1	Total	209.1
Grand Total		859.5	

Source: Developers and financiers, Bloomberg New Energy Finance. The total debt represents senior long-term loans (15 years) of $599m and mezzanine debt of $51m. The debt amounts for Standard Bank and Nedbank are unknown and were split equally between the two. Loan guaratees were also provided by the US Overseas Priate Investment Corporation and the African Development Fund uner its Partial Risk Guarantee.

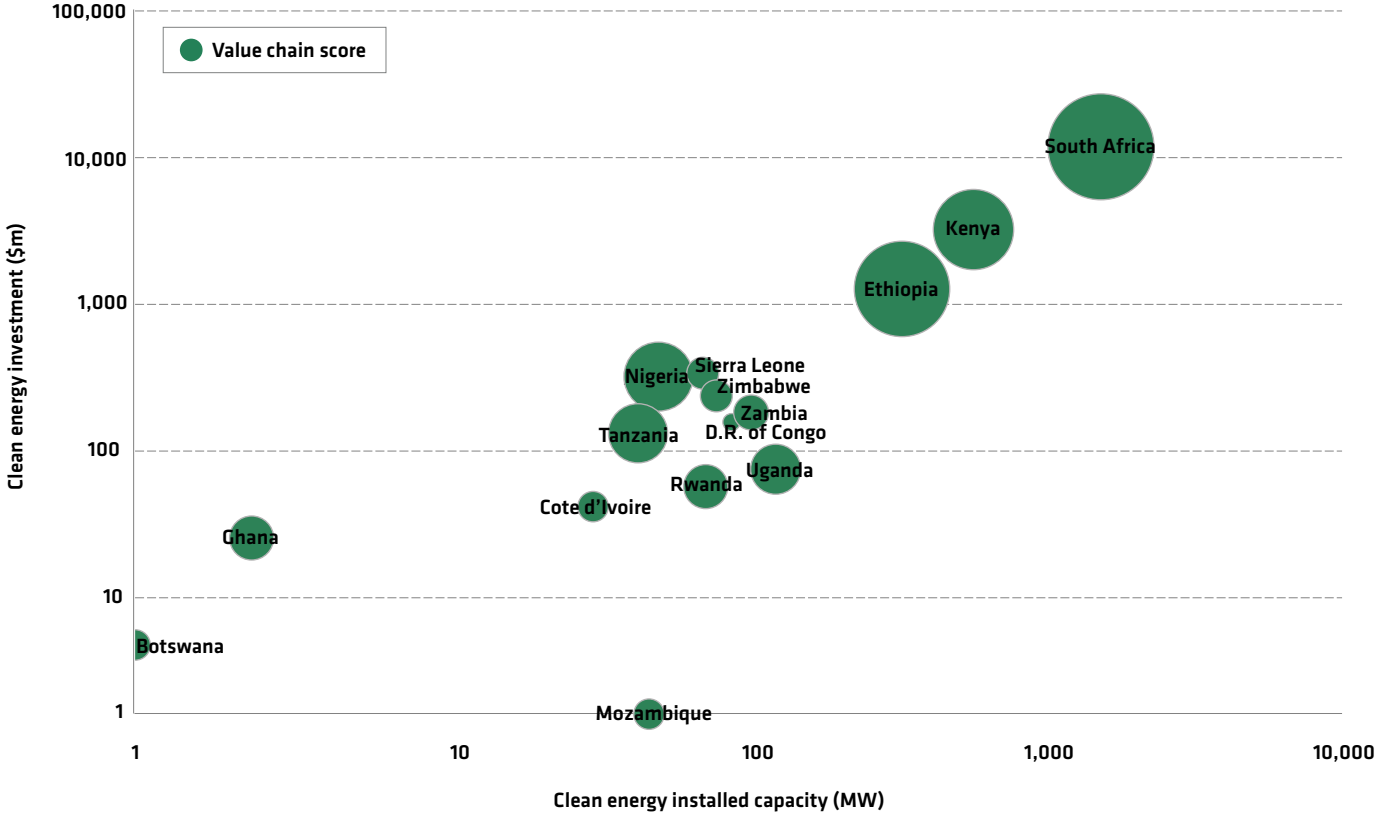
LOW-CARBON BUSINESS AND CLEAN ENERGY VALUE CHAIN PARAMETER III

Low-Carbon Business and Clean Energy Value Chain Parameter III assesses through three indicators the availability of local manufacturing and other capacity to spur clean energy deployment. These take into account the presence of local manufacturers, service providers, financiers and (for the African countries apart from South Africa) include those companies serving the off-grid and distributed energy sectors.

There was almost no variation in the clean energy value chains in place in the African countries in *Climatescope* over the course of 2014. South Africa, Uganda and Kenya again take the top three spots, and there is no change in the top 12 ranking apart from Ethiopia and Tanzania switching fifth and sixth places. We found a South African insurance provider for clean energy projects to add to the country's impressive roster of service companies active in the sector. The biggest movement in the parameter, however, was the DRC, which dropped several places as we found we had moderately overstated its meagre local manufacturing capacity in last year's assessment.

On the other hand, the higher ranked countries again demonstrate the presence of local players that could benefit from investment in clean energy. Aside from South Africa, which is really a separate case entirely, the countries that clocked high scores are those with relatively larger economies or that have seen the start of renewable energy project development in recent years. There is a clear relationship between clean energy investment and installed capacity, on one hand, and the size of the clean energy value chain, on the other. This is not controversial, or surprising, but *Climatescope* helps us demonstrate this with data.

VALUE CHAIN SCORE VS CLEAN ENERGY INVESTMENT, 2009-14 ($M) VS CLEAN ENERGY INSTALLED CAPACITY, 2014 (MW)



Source: Bloomberg New Energy Finance

South Africa's strong performance on Parameter III again reflects not just its regional relevance, but also the "local content" rules under its renewable energy auctions. Bidders are favored if they use components manufactured in-country. Solar and wind manufacturers have seen a surge in recent years, while biofuels, biomass and small hydro companies have existed for longer. South Africa's services sector befits an economy of its size, while many of its banks have been involved in financing the projects delivered through the REIPPP.

For the value chains and service providers assessed under the off-grid focus methodology, Uganda again came out top, with at least one locally-based company involved in off-grid energy including distributed solar, mini-hydro and clean cooking. Kenya, Tanzania, Rwanda and Nigeria also score strongly. In general, in many African countries the business of off-grid clean energy access – particularly through the retail of small-scale solar products – is gathering pace, albeit that may be restricted to larger towns (our analysis does not extend to the availability of these options in rural areas).

GREENHOUSE GAS MANAGEMENT ACTIVITIES PARAMETER IV

Greenhouse Gas Management Activities Parameter IV takes into account carbon offset project activity, level of policy support for carbon emissions reduction, and local corporate awareness of carbon issues through a total of 13 indicators.

In general, African countries have seen much less Clean Development Mechanism activity than Asia. This relates to risk perception, and the lower demand for credits from forestry projects versus industrial efficiency. Carbon reductions have also not been a priority for many African countries, which have lower emissions profiles to match their lower levels of industrialization.

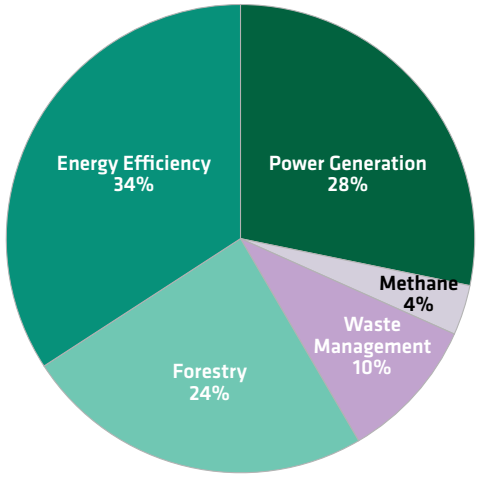
South Africa ranked 1st on Parameter IV, followed by Uganda, Ghana and Kenya. The only new entrant in the top five came with Malawi moving up a place: it registered three additional projects across the CDM and two voluntary carbon offset standards, as did South Africa, Kenya, Rwanda and the DRC. South Africa's 64 projects in total were trailed by 44 in Kenya, 25 in Uganda; but only Nigeria, with 11, is otherwise in double figures. The most common type of project was again energy efficiency with 14 of the *Climatescope* Africa countries' 18 new projects in 2014 falling under that category.

In *Climatescope*, the carbon offset score is levelized against total emissions, which meant South Africa did not score highly in this category because of its superior number of projects. Rather, it was among the few countries that host think tanks and business training in the sector – along with several East African countries and Ghana.

South Africa's Parameter IV score was also bolstered by its still being the only *Climatescope* Africa country to have any carbon policy to speak of. That may change beyond 2015, in the wake of the Paris climate conference – as indeed may the level of emissions reduction project activity on the continent.

AFRICAN GHG OFFSET PROJECTS BY SECTOR

202 GHG projects



Source: UNEP Risoe, Bloomberg New Energy Finance