

AfrElec

Africa Power Monitor

Issue 125

11 • October • 2017

Week 40

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Solar and mini-grid tech can play an efficient role in electrifying Africa, although governments must reduce fuel subsidies and promote feed-in tariffs

❖ **Ghana's green projects**

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❖ **Delta Sunrise hopes**

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Mozambique has invited foreign investors to participate in a US\$500m plan to develop off-grid projects in a bid to reach universal power access by 2030



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Have a question or comment? Contact the editor – Richard Lockhart (richardl@newsbase.com)

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Solar power set for swift inroads into Africa

Solar and mini-grid technology can play the most efficient role in electrifying Africa, although governments must reduce fossil fuel subsidies and promote feed-in tariffs, writes Kevin Godier

AFRICA

WHAT:

A new IEA report said off-grid solar was making a major impact in Africa

WHY:

Solar power has increased energy output globally faster than any other fuel

WHAT NEXT:

Off-grid SHS capacity in Africa is set to almost triple by 2022, the IEA said.

AFRICA is feeling the benefits of a rural revolution in distributed solar, linked to the global boom in solar energy, which is now the fastest growing energy source in the world, according to a recent International Energy Agency's (IEA) report on renewables.

The Paris-based IEA cited 2016 as a watershed moment, a year when 164,000 MW of new renewable energy capacity came online around the world, more than triple the amount of new gas-fired power plants, and more than twice the volume of coal.

Though solar energy still provides only a small share of the world's electricity generation, the world nonetheless added 74,000 MW of solar power in 2016, an amount comparable to the annual output of Turkey, according to the Renewables 2017 report, released on October 4.

For the first time, the report's forecasts have taken a closer look at how off-grid solar photovoltaic (PV) applications are developing in Asia and sub-Saharan Africa.

This includes industrial applications, solar home systems (SHSs) and mini-grids driven by government electrification programmes. It concluded that while the lion's share of solar growth has involved utility-scale projects, about 40% involves small systems to power homes and businesses.

The IEA analysts predicted that off-grid solar capacity in Africa, delivered by small-scale PV systems, is set to roughly triple in the next five years, enabling basic electricity services to be delivered to tens of millions of additional consumers in sub-Saharan Africa by 2022.

This will be expedited by innovative payment solutions that allow low-income populations such access, the report projects.

So dynamic is this trend that off-grid SHS capacity in Africa is set to reach around 1,000 MW by 2022, the report said.

East Africa has been a key launchpad for off-grid solar systems.

In Tanzania, for example, the national grid supplies electricity to less than 20% of the population, according to a new World Resources Institute (WRI) report.

Other parts of the country are served by more than 100 "mini-grids" connected to oil-burning or hydroelectric plants.

While these two sources combined reach about a quarter of Tanzanian homes, a further 8% already receive power from solar systems, the WRI said, using panels which have been going up in mostly rural villages, linked to lithium-ion batteries that provides electricity around the clock. In Rwanda, innovations include a solar-powered mobile kiosk that charges phones and connects communities.

Quicker access

Even though the IEA's 1,000 MW off-grid SHS figure represents less than 5% of total sub-Saharan PV capacity, the positive socio-economic impact as the electrification gap is gradually bridged will be enormous.

Africa remains gripped by an immense energy crisis, despite its abundance of natural resources and status as the sunniest region on earth. In a continent with a population of close to 1 billion, 68% are without power, according to the IEA.

"The social impact is very high," Paolo Frankl, the head of the IEA's renewable energy arm, told reporters in early October. Not only could millions soon have electricity in their homes for the first time, but others can replace "expensive and polluting" diesel-powered generators, he said. "It's a combination of technology progress and new business models," Frankl said.

The harsh reality is that the traditional model of building and connecting power plants – which still tends to be the focus for politicians and international development institutions – is a prohibitively expensive endeavour that can over-stretch the finances of already poor countries and take years to complete.

Russell Sturm, who oversees energy access programmes at the World Bank's International Finance Corporation (IFC) has recently estimated that it would cost US\$800 billion to electrify Africa in this way.

This is "money that doesn't exist," he said.

While players such as the African

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Off-grid solar capacity in Africa, delivered by small-scale PV systems, is set to roughly triple in the next five years



- Development Bank work to build additional power generation capacity, the question of how to get power from where it is generated to where it is needed often remains unaddressed, or is deemed unaffordable.

Nimbler models

By contrast, the cheap and increasingly available technology behind individual SHSs or small-scale “micro-grids” stand poised to surpass industrial-scale power projects much in the same way that mobile networks gave millions of people access to communications at a faster pace than many countries could string telephone wires.

This trend has been abetted by new forms of financing and payment plans, generally transacted via smart phones, which have covered the up-front costs of installing a system, and have facilitated pay-as-you-go purchasing of each new panel.

Even in West African countries, where about only 15% of the population has access to power, cheap solar-powered devices have become available that provide energy incrementally, enough for light and charging phones at the lower end of the income scale, and facilitating devices like radios or televisions for better-off consumers.

Encouragingly, North African nations – led by Egypt, Algeria, Tunisia, and Morocco - have already been lengthening their strides with renewable power generation, by drawing the power of the Saharan sun into their grids.

In Tunisia, for example, the US\$10.7 billion, 2,500-MW TuNur solar project will open a new, intercontinental energy corridor between north Africa and Europe, connecting to European grids as far away as the UK.

In Morocco, the Noor Ouarzazate complex, touted as the world’s largest, is scheduled for

completion in 2018 at a cost of US\$9 billion.

The 150-MW Kuraymat solar power field in Egypt, built in 2010, already supplies nearly 2 million people with power. Such schemes show the feasibility of scaling solar technology for larger use, enhancing energy security, and boost the creation of new African business opportunities.

What next?

Given that the IEA tends towards conservative forecasting, NewsBase Intelligence (NBI) believes it is under-estimating what will happen.

NBI envisages off-grid SHS capacity in Africa hitting the 1,500 MW mark by 2022, given the pace of technological developments and the decreasing costs of the technologies.

In the next decade, NBI foresees that the solar boom can find even longer African legs if supportive government policies are enacted, for example in the areas of cutting away still-wide-spread fossil fuel subsidies and enacting feed-in tariffs (FiTs).

Strengthened public-private partnerships would also permit African governments to tap into an additional range of know-how and experience in order to successfully implement more renewable energy installations.

Such collaboration would strongly support the push for universal electrification.

There is an additional need to refine approaches for financing high interconnection costs that limit the market for mini-grid power, and to develop financing options that have longer repayment periods for mini-grid developers.

Whatever speed these points are addressed at, a future pivoting increasingly around solar power is a near-certainty for every African country.❖

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enacted

Ghana's green energy projects await sign-off

Ghana's decision to cut renewable subsidies may cause immediate concern, but in the long-term Accra has ambitious plans to develop its renewables sector at a sustainable pace and cost, writes Nicholas Newman

GHANA

WHAT:

Ghana has started renegotiating downwards the subsidy levels for green power

WHY:

Costs have ballooned and investors have called for a more transparent renewables policy

WHAT NEXT:

The government wants renewable projects to account for 10% of supply by 2020

SINCE taking office in January 2017, Ghanaian President Nana Akufo-Addo, alarmed that the country's dash for electricity risked swinging from power shortages to a power glut, has applied the brakes on the power procurement process.

Renewable projects were prominent among the dozens of contracts granted to developers in recent years as Ghana scrambled to overcome a chronic electricity shortage.

To the consternation of investors, the new government has begun the process of renegotiating downwards the subsidy levels for green power and delaying or even cancelling some projects.

Investors, for their part, have raised concerns over the inadequacy of tariffs, the poor investment environment and the limited availability of renewable technological capacity and experience.

To fulfil its ambitions, Ghana's Energy Commission is currently proposing the introduction of tax credits designed to encourage investment and purchases of solar, wind and biofuels so that renewables could contribute 10% of electricity production by 2020.

Ghana's electricity market

With 80% of Ghana's 30 million population having access to electricity, it ranks alongside South Africa, rather than sub-Saharan countries, where just 29% have access to reliable electricity, as is noted by former Minister for Power Kwabena Donkor.

Nevertheless, the country's inadequate electricity supply remains a constraint to its economic growth.

For instance, power cuts in 2015 are estimated to have cost the economy US\$2.2 million per day, according to Ghana's Institute of Statistical, Social and Economic Research.

Actual power output supplied

In April 2017, Ghana produced 1.204 billion kWh of power and this was augmented by 17.98 million kWh of electricity imports from Côte d'Ivoire.

However, actual output fell well short of the 1.338 billion kWh target set by the Electricity Supply Plan (ESP).

Lower than planned imports from Côte d'Ivoire and lower supply from the country's HPPs accounted for the 116.3 million kWh

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The new government has begun the process of renegotiating downwards the subsidy levels for green power and delaying or even cancelling some projects



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- ▶ shortfall, causing scheduled power cuts – dubbed “dumsor” locally – which have led to street demonstrations.

Unusually for Africa, independent power producers (IPPs) provide half of all domestic power generation, with state agencies a close second at 49% and imports of electricity providing the remainder.

Installed generating capacity

The country's installed capacity of 2,930 MW is divided between thermal at 1,550 MW, of which, 890 MW is provided by IPPs, and 1,380 MW of hydropower, of which only 700 MW is currently available, reports Ghana's Energy Commission.

Over the past decade, domestic electricity output has suffered owing to intermittent supplies of Nigerian oil and gas for TPPs and low water levels at the country's dams.

Surprisingly, renewable energy accounts for just 1% of all installed capacity despite Ghana's rich wind and sun potential and the high debt burden from imports of crude to power the country's TPPs.

To meet future demand for electricity, government estimates envisage increasing electricity capacity to around 4,200 MW by 2026.

The Scaling Up Renewable Energy Programme (SREP) Plan for Ghana envisages that 10% of electricity production will come from solar, wind and biofuels by 2020, and that by 2030 solar capacity would reach 1,000 MW and wind 800 MW, from zero today.

Projects

The government's aim to increase renewables' contribution to 10% cent by the end of the decade seems realistic given a wind potential of 300-500 MW and solar irradiation speeds of 4.5-6.0 kWh per square metre per day.

Construction on UK-based Blue Energy's US\$400 million, 155-MW solar project at Nzema in western Ghana is due to start in December, having gained all the planning consents, environmental permits and regulatory approvals. Equally important is a valid power purchase agreement, as well as a connection agreement, with the Ghana Grid company to connect at transmission voltage into the West African inter-connector.

Finance is being provided by a constellation of international lenders and Development Finance Institutions. Once complete, the Nzema solar plant is expected to supply electricity to 100,000 homes and add 65 to Ghana's current generating capacity.

Nzema project director Douglas Coleman points out that unlike many other solar projects in Africa which rely on concentrated solar power, the Nzema plant will use photovoltaic (PV) technology which is more suited to the sun in Ghana.

The first grid-scale wind farm in West Africa is nearing completion in Ghana. The US\$525 million, 225-MW Ayitepa wind farm project 60 km east of Accra signed a Grid Connection Agreement in September. The project developers, Mainstream Renewable Power, an Irish-based renewable energy group, together with Swiss wind farm developer NEK Umwelttechnik, expect the development to meet at least 4% of Ghana's domestic electricity demand.

On a smaller scale, Ghana's Energy Commission is making available for purchase 200,000 500-W solar panels for home users. The panels each cost US\$1,500.

One thing is clear, Ghana's pause for reflection and incipient reforms are a positive sign about the country's ambitions to develop its renewables sector.❖

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Power cuts in 2015 are estimated to have cost the Ghanaian economy US\$2.2 million per day,

Mozambique needs foreign investment to fulfil US\$500m off-grid plan

MOZAMBIQUE

MOZAMBIQUE has invited foreign investors to participate in a US\$500 million plan to develop off-grid renewable energy projects in a bid to reach universal power access by 2030.

Only 26% of the country's population of 26 million currently have access to mains electricity.

The Ministry of Mineral Resources and Energy introduced the programme in September. It will use mini-grid and micro-grid projects to produce electricity for remote areas across 10 provinces that until now have been without power.

Mozambique's sustainable energy development fund, FUNAE, is promoting two mini-grid systems using hydro power that will eventually serve 332 villages.

The fund is also backing the placement of 343 solar photovoltaic systems in rural communities. These include 10 solar-storage mini- and micro-grids with capacities of 1-3 MW and 111 systems each with the capacity to generate 1-10 kW.

The country is using the Sustainable Energy for All (SE4ALL) Africa Hub model launched by the African Development Bank (AfDB) in 2015 as part of the Green Mini-Grid Market Development Programme, which is funded by the bank's Sustainable Energy Fund for Africa.

A white paper published in April 2017 by SE4ALL Africa Hub said that off-grid mini-grid

and micro-grid systems relying on diesel fuel have been used throughout Africa in the past but have failed to provide villages and small towns with electricity.

Fuel-based systems have generally operated at a loss, as the fuels were being subsidised and electricity was being sold at a price below the costs of production and distribution.

The April 2017 white paper, which focused on Mozambique, concluded that the most cost-effective approach for powering mini-grids is to use local renewable energy sources, which is also widely available across Africa.

For example, Mozambique's geographic location provides it with huge amounts of sunlight that could be used for solar power generation.

Mozambique has so far deployed a number of off-grid photovoltaic systems that are being used in 11 cities, 669 schools, 623 health centres and 77 public buildings.

Now using the Green Mini-Grid Development Programme, it is working to attract financing from private sector banks, investment funds and developers experienced in such projects.

Separately, the World Bank in September approved a grant of US\$150 million for Mozambique that will be used by the state-owned utility company to make improvements in the existing power grid.❖

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Only 26% of the country's population of 26 million currently have access to mains electricity



Nigerian government aims to sell remaining distribution interests

NIGERIA



THE Nigerian government has announced its readiness to divest its equity in the country's distribution market, a move which will increase private control of the electricity value chain.

Nigerian Power Minister Babatunde Fashola revealed the new policy while inviting investors to submit proposals for the acquisition of its equity interests in distribution companies.

The Nigerian government retained a 40% interest in each of the eleven distribution companies that emerged after partial privatisation in 2013.

The value of the government's equity was not disclosed, but over the last three years the government had injected over US\$500 million as bail out funds to ease liquidity problems across the electricity value chain.

Although Nigeria generates about 7,000 MW of electricity, 2,000 MW is wasted every day because of systemic inefficiencies, said Nike Akande, president of the Lagos Chamber of Commerce and Industry.

She urged the government to fast-track its divestment process and to bring the distribution sector fully under private control. Fashola also outlined how private investors had proved successful in managing generating assets.

"The Shiroro HPP for instance, with 600 MW of capacity, has just gone on its first maintenance ever since it was built in 1990, because it is now owned by the private sector," he said.

He added that the government was now offering the Afam gas power plants (1-5) in Rivers State to the private sector.

Three additional generating plants have also been approved for privatisation. These are: Keregu (506 MW); Calabar (634 MW) and Alaoji (1,076 MW).

Looking to the future, the critical issue of tariff reform remains a sore point between the government and electricity service providers, with the government insisting that efficiency and competition, rather than higher tariffs, are the best ways for companies to reduce losses. ♦

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The critical issue of tariff reform remains a sore point between the government and electricity service providers

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RURAL ELECTRIFICATION

AfDB funding for Burkina Faso energy

BURKINA FASO



THE AfDB has been a key player in driving development in Burkina Faso, financing 16 projects. The announcement was made during a visit by AfDB President Akinwumi Adesina to the west African nation.

Among the projects that will be supported by the AfDB is a dorsal northern electric interconnection with the goal of connecting Nigeria, Niger, Burkina Faso and Benin.

The AfDB will also grant budgetary support to the construction of several large-scale PV projects in Burkina Faso, which will possess a combined capacity of 50 MW. Equal funding for the projects will also be received from the French Development Association.

Solar will be utilised in schools and sanitary infrastructure, including solar pumps in rural areas and solar lamps in the capital Ouagadougou.

The AfDB will also assist in the installation of an interconnection project in the region of Bobo-Dioulasso, which will help link Ghana, Burkina Faso, and Mali.

The AfDB has been a key player in driving development in Burkina Faso, financing 16 projects.

The total volume of the bank's portfolio stood at 280 billion CFA francs (US\$500 million) at the end of August, with the Burkina Faso government seeking to increase cooperation further.

"We have high expectations from the input of the African Development Bank. We wish to cooperate even more, so as to boast the highest number of Burkinabe who have access to electricity," President Roch Marc Christian Kabore stated.

Over the past decade, electricity demand has increased by 13%, outpacing the growth in electricity supply of 8%.

However, Burkina Faso is taking steps in the right direction, with a 33-MW solar plant currently under construction expected to be completed in August.

The Zagoutli plant, which is also being partially funded by the French Development Association along with the European Union, will supply 5% of the nation's total electricity consumption once it begins operation.

Burkina Faso's annual power consumption is among the lowest in the continent at 35 kWh per capital. Meanwhile, the national electrification rate stands at just 19%♦

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The AfDB has been a key player in driving development in Burkina Faso, financing 16 projects

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Siemens turbines for Delta State IPP

NIGERIA



SIEMENS is to supply three SGT800 turbines to the Delta Sunrise independent power project (IPP) in Nigeria's Delta State, adding 150 MW to the national grid upon completion.

Siemens signed a co-operation agreement in July 2013 with IPP developer Proton Energy Limited for the development of 500 MW of capacity in Ogoprod-Sapele, in the Sapele local government area.

However, the initially proposed 125-MW first phase was significantly delayed. Proton Energy was finally awarded a licence in 2015, to expire in 2025.

During a ground-breaking ceremony held on September 28 in Sapele, the chief executive of Proton Energy, Oti Ikomi, underlined that the plant's turbines would "have good operating flexibility that will enable the plant to ramp up to full capacity at times of peak needs thus contributing to grid security."

Using a modularised design, the capacity of the plant can quickly be expanded to 500 MW to address Nigeria's growing energy needs," he said.

Ikomi said the plant would begin operations in 2018 when most of the infrastructure,

technical and electrical installations will have been completed.

The Delta Sunrise project will attract up to US\$250 million of foreign direct investment into Nigeria, and provide up to 1,000 jobs in Sapele during construction.

According to Andreas Pistauer, Siemens' vice president, power and gas, Africa, the German company will provide technological training in Delta State, enabling Nigerians to "build, operate and maintain this power plant." The scheme is proposed to be funded on a project finance basis, of roughly 70% debt and 30% equity.

During his address at the ceremony, Pistauer noted that Siemens was currently building more than 17,000 MW of generating capacity in Africa, including the 450-MW Edo-Azura scheme in southern Nigeria and projects in Sudan and Egypt.

Pistauer cited the "very high" cost of power in Nigeria, estimating that the price for reliable supply varies between 80 -150 naira (US\$0.22-0.41) per kWh, plus the cost of a backup generator, the fuel, the capex and service. "Proton Delta Sunrise can drastically reduce these costs," he added. ♦

The Delta Sunrise project will attract up to US\$250 million of foreign direct investment into Nigeria

COAL

Vale picks Mota Engil for coal contract

MOZAMBIQUE



BRAZILIAN mining group Vale has awarded Mota-Engil Africa a US\$445-million contract to supply mining services to its US\$2.068 billion Moatize coal mining project in Mozambique.

Mota-Engil Africa, a subsidiary of the Portuguese engineering, construction, contract mining and services group Mota-Engil, will undertake drilling, the supply of explosives, and the loading and transport of both coal and waste material at the Moatize mines in Tete province.

The waste from the coal mine will be reused to generate electricity to power Vale's operations and supply the excess to local communities.

The contract comes six months after Vale, which won the concession for the Moatize coal mines in 2004, sold 15% of its 95% stake in the coal project for a total of \$770 million to Japan's Mitsui & Co Ltd.

However, Vale, through its subsidiary Vale Mocambique, has up to December to raise the requisite financing for the second phase of the US\$2.068 billion coal project to meet conditions set out in the agreement between it and Mitsui.

If the financing will not be in place by

December, Mitsui has the option of transferring back to Vale the 15% stake.

The contract to Mota Engil to transport Vale's coal also comes at a time when Brazilian company has successfully sought the backing of Mitsui in its investment to unlock the logistics hurdle that has held back the coal project.

Vale has invested in the development of the 912-km Nacala rail Corridor that links Moatize mines to the port of Nacala, which will transport 18 million tonnes per year of coal.

The Brazilian firm is also developing the 575-kilometre Sena railway that connects Moatize to the port of Beira and with capacity to carry 6 million tonnes of coal per year.

Vale said previously the coal from Moatize will be sold mostly to India, the Americas, Europe and Eastern Asia. Part of the deal between Vale and Mitsui involves the Japanese firm contributing US\$348 million for a 50% share in the Nacala Logistics Corridor, a company that is to operate the Nacala transport corridor, and also providing a long-term facility of US\$165 million to the company. ♦

Vale has up to December to raise the requisite financing for the second phase of the US\$2.068 billion coal project

HCCL targets higher production in Zimbabwe

ZIMBABWE



ZIMBABWE'S Hwange Colliery Company Limited (HCCL) aims to produce 4.8 million tonnes per year of coal by early 2018, up from the current level of 3.6 million tonnes per year.

"By the end of the year, we expect to have resumed underground mining operations. Our production target will be 400,000 tonnes per month going into 2018 and we will rebalance the mix of thermal, industrial and coking coal so that our profitability is maximised," HCCL managing director Thomas Makore said last week.

The mining company, the official said, has raised around US\$3.2 million loan to revive the operations in some mines in its two coal fields that were suspended in 2015.

The existing coal mines, both opencast and underground, in the two fields – Hwange and Chaba – in northwest Zimbabwe currently produce around 300,000 tonnes per month.

HCC has already acquired mining equipment from Belarusian manufacturer Belaz and India's Bharat Earth Movers Limited (BEML) through vendor funding from PTA Bank and Exim Bank of India. The produced coal will be supplied to consumers in Zimbabwe and neighbouring

countries such as Zambia, South Africa and DR Congo.

"Our goal is to increase the contribution of export revenues from the sales of coking and industrial coal, well as coke," he added.

The company recently signed two separate coal supply agreements with state-run Zimbabwe Power Company Limited (ZPC) and IPP Lusulu Power Limited to supply coal of more than 200,000 tonnes per month to each for a period of 25 years.

Last week, Zambezi Gas Zimbabwe Limited announced plans to double coal production from the Entuba Field in the Zambezi Basin, western Zimbabwe, to 1.8 million tonnes per year following the renewal of mining licence for additional 25 years.

The Zimbabwe government has asked the mining companies to boost coal output in the wake of falling coal production and its negative impact on power generation in the country.

Coal production, according to Chamber of Mines of Zimbabwe, dropped by 38% to 2.7 million tonnes, despite the presence large coal resources in the country. ♦

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The coal will be supplied to consumers in Zimbabwe and neighbouring countries such as Zambia, South Africa and DR Congo.

RENEWABLES

Guinea-Bissau to develop solar with US\$45m loan

GUINEA-BISSAU



THE West African Development Bank (BOAD) has granted Guinea-Bissau a US\$45 million loan to build 22 MW of solar projects in a bid to boost the country's electricity output.

BOAD chairman Christian Adovelande approved the loan for partial funding of a large solar PV plant in Bissau, which is the country's main commercial hub, while there will be mini solar facilities in Gabu and Canchungo.

Guinea Bissau's government will use proceeds of the loan to construct a 20-MW solar plant at Bissau and two 1-MW facilities at Gabu and Canchungo.

"The implementation of this project will provide 500,000 people with access to energy, reduce greenhouse gas by 24,100 tonnes and alleviate housework through the installation of mills and multi-purpose platforms and better safe water supply," said Togo based BOAD without disclosing further details.

Solar energy use, according to Renewable Energy & Energy Efficiency Partnership (REEEP) is minimal despite Guinea Bissau

receiving about 3,000 sunshine hours per year.

"The legal framework in support of extending renewable energies is weak, but there are plans to increase solar use by about 2% of total energy consumption," said REEEP. Guinea Bissau has a population of 1.75 million.

Wood supplies 90% of energy in Guinea Bissau, which has about 20,000 square km of forest. Annual use of wood for energy is about 48.3 million cubic metres, translating to a deforestation rate of 300 to 600 square km per year.

The Geba river and its main tributary the Corubal are estimated to have 184 MW of hydro potential. However, hydro is still not an important source of energy.

The coast of Guinea-Bissau, with its deeply indented coastline, experiences high tidal range values, making this a commercially viable energy resource.

The highest mean annual tidal amplitude of 3.4 metres recorded at Porto Gole, on the banks of Rio Geba, and could generate 50 MW of electricity. ♦

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The legal framework in support of extending renewable energies is weak, but there are plans to increase solar use by about 2% of total energy consumption

Zambia's Scaling Solar success

ZAMBIA

ZAMBIA'S participation in the World Bank's Scaling Solar initiative means that renewable energy has made major progress in recent years, with 88 MW of solar capacity already awarded at tender.

Zambia has launched its first tender for the finance, construction, operation and maintenance of 100 MW of new capacity, and is now moving on to the next phase with much bigger plans in mind.

Derrick Botha, power and renewables analyst at BMI Research, told NewsBase Intelligence (NBI) that "non-hydropower renewables is now a potential bright spot, as the first 100-MW tender through the Scaling Solar initiative was successful, with 88 MW of capacity awarded. Now, the Zambian government is looking to have up to 600 MW of solar capacity installed. From our perspective these are very positive developments."

The next phase of Zambia's ambitious solar power plans is already in progress. Botha added that "the second round of awarding 300 MW of capacity is now under way, with 12 companies shortlisted." Following this, a third tender is expected.

Construction of a 54-MW solar plant under the Scaling Solar initiative by a consortium of France's Neoen and US-based First Solar at Kafue District near Lusaka has now started, with a completion date expected in May 2018.

The plant has a 25-year power purchase agreement (PPA) with state utility Zambia Electricity Supply Corporation (ZESCO), which Neoen said is priced at US\$0.06 per kWh within the framework of the Scaling Solar initiative.

The success of the solar programme backs up new hydro projects at Kariba North and Kafue Gorge, which will deliver over 2,000 MW, and

the 300-MW coal-fired Maamba plant, which started production in 2016.

Zambia has good reasons to take up the opportunities offered by the Scaling Solar programme. As well as the obvious abundance of sunshine hours, solar power is complementary to some applications in Zambian commerce, such as its important dried fruit industry.

On a wider level, greater self-sufficiency in power generation is very important for Zambia.

Heavy imports have created dependence on South Africa's Eskom and Mozambique's EDM, and this is now motivating moves to develop the domestic power sector.

BMI noted that the power trading situation had improved somewhat in recent months. A decline in power imports from South Africa and Mozambique had been observed in 2017 owing to improved domestic power output, largely thanks to the Maamba plant.

But, while the solar sector is a bright spot, the expected level of renewable power could create fresh problems owing to the continued high percentage of hydroelectric power.

BMI's Botha said that new Zambian capacity growth is still "very heavily hydropower-focused, and hence, it is vulnerable to droughts, as was already seen between 2015 and 2016. At that time, decreased rainfall leads to substantial power cuts."

Zambia's participation in the Scaling Solar initiative provides an encouraging model.

By supporting the development of new hydro power and coal-fired capacity, Zambia has taken full advantage of the Scaling Solar initiative.

The next steps will see more private finance emerging to develop new projects as the second tender is concluded, and another push to pave the way to reach the 600-MW target. ♦

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Greater self-sufficiency in power generation is very important for Zambia



POLICY**Algeria plans to increase budget spending by 25% in 2018**

Algeria plans to increase state spending by 25% in 2018 after two years of falling expenditures, the presidency said, despite growing financial pressure due to a fall in energy earnings. Oil and gas sales account for 60% of the budget and 95% of total exports.

In a bid to ease financial pressure, the government has drafted amendments to the Money and Credit Law to allow the central bank for the first time to lend directly to the public treasury to finance budget deficits and internal public debt and provide resources for the National Investment Fund. This type of "exceptional funding" will be implemented for five years and "accompanied by economic and financial structural reforms," the government has said.

The rise in spending for next year will help launch delayed projects in the education, health and water resources sectors and cover subsidies for housing and basic foodstuffs, including cereals, cooking oil and sugar, the statement said. The extra spending will also be used to settle delayed payments for foreign and local firms mainly in the construction sector.

The government expects a budget deficit of 9% of gross domestic product in 2018, up from the 8% forecast for this year but down from 14% in 2016, the presidency said in a statement after a cabinet meeting.

NASDAQ (US), October 5, 2017

**Nigeria's Fashola says electricity law near perfect**

The Electric Power Sector Reform Act that was passed in 2005, which serves as Nigeria's electricity reform law, is one of the best in the world and is almost perfect, Minister of Power, Works, and Housing Babatunde Fashola has said. He stated this at the 2017 Power Africa Nigeria Conference in Abuja, adding that nothing was wrong with the law in its entirety, as concerns about the act might be on its implementation by the government.

Fashola explained that with the law, the business of power generation, transmission and distribution had been democratised and was now within the domains of both the federal and state governments to consider investing in. "The EPSR Act is a great piece of legislation that is comparable to any other in the world. That law was put together by members of the National Assembly whom Nigerians elected as their representatives, and who committed to giving Nigeria a law to enable us develop our power sector," he stated.

The minister noted that in implementing reforms, which the law enunciated, like the privatisation of defunct Power Holding Company of Nigeria, there might have been errors that had left some gaps. He, however, stated that the government would close the gaps and correct the errors by using the recently approved Power Sector Recovery Programme.

"We now have the PSRP to fill the gaps in the privatisation that were perhaps omitted, and also enable us pass through what I believe is a transitional phase from government monopoly to private sector operated

power sector," Fashola said. The minister told participants at the event that state governments were now free to invest in power generation, transmission and distribution.

PUNCH (NIGERIA), October 5, 2017

Eskom's increase request worse than 'attempting to milk a mosquito dry'

The proposed increase request by Eskom is worse than "attempting to milk a mosquito dry," because it disregards the fact that more than 30.4 million South Africans are living in poverty. The African National Congress Youth League made this comment as it called on the National Energy Regulator of South Africa (Nersa) to reject Eskom's request of a 19.9% increase in the tariff it charges for electricity.

The league said Eskom disregarded the reality that almost 32% of households' disposable income went toward housing, water, electricity, gas and other fuels. "This absurd proposal ignores the grim reality that almost 75% of South African households' net income is used to service creditors and 60% of these South Africans, which will be the hardest hit by this tariff increase, struggle to service their debt consistently."

Last month, Nersa approved the process and timelines for processing Eskom's allowable revenue application for the 2018/19 financial year. Eskom in August applied for a total allowable revenue of 219 billion rand. This translates to a 19.9% average increase in electricity tariffs. "This ridiculous increase proposed by Eskom will result in those buying electricity from municipalities paying almost 28% more for electricity, after municipalities have included their mark-up," the league said.

Public hearings on Eskom's revenue application will be heard from October 30 to November 17 and Nersa will make a decision on Eskom's revenue application on December 7.

SUNDAY TIMES (SOUTH AFRICA), October 11, 2017

GRID**ECG installs US\$3.1-million substation at GIMPA**

The Accra East Region of the Electricity Company of Ghana (ECG) has built a new primary substation worth US\$3.161 million near the Ghana Institute of Management and Public Administration (GIMPA) to boost



► power supply to the 6,000 customers in and around the area. The facility, which brings to 22 the number of primary substations in the region, is expected to benefit residents at Kissemann, Westland, Achimota School, North Dzorwulu, Ghana Water Booster Station, Achimota Golf Park, Achimota Forest area, Pure Fire, Abofu, Christian Village, Dome, North Abelemkpe, West Legon and Mcbright Towers.

The project was funded from the company's internally-generated funds (IGF).

"As the city expands we try to keep up with the development with the increase in demand. Day in day out we study the load grid and plan to keep up with the demand," Accra East regional manager of the ECG Jones Makumator said.

He said following the completion of the project, the reliability of the supply of power in the area had improved, and that it was the primary substations that supplied power to the secondary substations that fed customers in their homes, factories, schools, hospitals, among other places. He said the construction of the substations was a regular phenomenon in order to keep up with the load growth and to prevent the total collapse of the system.

Makumator said before the construction of the GIMPA primary substation, "complaints kept on coming from customers in the areas that have been mentioned, but since we finished the new primary substation the supply and quality have improved". The situation had improved because the feeders that had been connected to the facility were not overloaded as they have enough room to supply more customers, he said.

GRAPHIC (GHANA), October 6, 2017

New substation to boost Libya's Sarir oilfield

A power substation at Libya's Sarir oilfield that was damaged by fire in January has been replaced, allowing for a production boost of 26,000 bpd, the company operating the field said. Workers finished installing the substation on October 7 and production was

expected to rise in the next few days said Youssef Amreemi, an official from Arabian Gulf Oil Company (AGOCO), a subsidiary of Libya's National Oil Corporation.

AL ARABIYA (UAE), October 10, 2017

Tanzanian rural areas ready for electricity

Norway supports Tanzania in achieving its Sustainable Development Goal on energy. Through the Rural Electrification Densification Programme, 303 villages close to an existing line will be connected. Some of these villages have been under the line for more than 20 years waiting to be connected to electricity.

Implementation is now ongoing, and the embassy visited some of the villages under the programme in Mbeya and Songwe regions on October 5-6. Progress is good, and the potential number of connections is four times what the programme was designed for. The embassy considers that a great success.

CNBC AFRICA (US), October 7, 2017

SUPPLY

Meralco vying for contract in Ghana

Meralco Electric Co. took part in the second round of bidders' briefing with the government of Ghana to take a shot at a power distribution concession in the West African capital of Accra. According to Ghana's Millennium Development Authority (MiDA), Meralco is one of the shortlisted entities from across the globe that met with state officials recently.

Meralco's rivals for the contract to manage the Electricity Company of Ghana Ltd. (ECG) are the consortia of CH Group (Ghana)/EDF SA/LMI Holdings/Veolia SA; BXC Company Ghana Ltd./Xiaocheng Technology Stock Co. Ltd./Shaanxi Regional Electric Power Group Co. Ltd. (China) and Tata Power Co. Ltd.

(India)/CDC Group Plc (UK).

Ghana officials included representatives from the country's ministries of finance, energy and justice; the Attorney General's Department, Public Utilities Regulatory Commission, Energy Commission, ECG and MiDA. "The goal has remained the same, to procure a concessionaire who would not only inject the required financial investments ECG needs, but also introduce modern technology and efficiency strategies that would turnaround the operational and financial fortunes of ECG," MiDA chief executive Owura Sarfo said in a statement.

"The meetings have been planned to ensure that all clarifications and questions from each applicant are adequately addressed and everyone is on the same footing as we proceed to the remaining stages of the procurement process," Sarfo said. According to MiDA, the applicants have until January 5, 2018, to submit their bids for evaluation.

INQUIRER (PHILIPPINES), October 7, 2017

Nigeria's power generation capacity above 7,000 MW

Nigeria has increased its power generation capacity above 7,000 MW, although challenges persist with distribution to consumers, vice-president Yemi Osinbajo has said. Osinbajo said the government was determined to realise its target of 10,000 MW generation capacity set in Nigeria's power generation capacity above 7,000 MW.

"Government is dealing with the constraints of power distribution to ensure generated power get to the consumers. The Nigerian Electricity Regulatory Commission, NERC is working on an arrangement to ensure independent power distribution companies to sell power directly to metered customers. This will not only help realise the 10,000 MW generation capacity envisaged in the ERGP, but also build to deliver that capacity to customers," he said.

Resolving the challenges in power generation, he said, was part of the government's efforts to develop the infrastructure necessary to sustain the growth of the economy following the exit from recession in the second quarter of this year. The vice-president highlighted some of government's achievements since last year's Economic Summit to include the resolution of the foreign exchange crisis and the restoration of stability in supply to investors and small businesses.

"The issue of scarcity of foreign exchange last year has not only been turned around, but has stabilised, with foreign reserves rising

► to over US\$32 billion, with end users having increased access to foreign exchange to do their businesses," he said. "The inflows into the economy from remittance by Nigerians have increased to about US\$1.8 billion, almost doubling the figure realised from the first quarter of this year, with the Anchor Borrowers Programme benefitting over 200,000 small-scale farmers, with over 43 billion naira of new investments from local investors."

PREMIUM TIMES (NIGERIA), October 10, 2017

Powering Nigeria's global economic rise

Nigeria continues its ascendency as Africa's largest economy, despite having 25% of the power generation capacity of its economic rival South Africa. Having achieved so much with so little, there is no doubt that Nigeria has the potential to become Africa's first global superpower. International studies suggest that Nigeria could potentially achieve over 7% annual GDP growth, making it a top-20 economy by 2030 with GDP of more than US\$1.6 trillion – four times the current GDP.

This translates into 70 million people being moved above the poverty line in little more than a decade. But the fact remains that this potential will never be realised without sufficient access to end-to-end electrification, which is the backbone of any thriving economy. This includes power generation, transmission, distribution and the efficient application of electrical energy through automation.

60% of Nigeria's 182 million people have access to electricity. The majority of

this power is generated by an ageing and inefficient grid that loses 8.6 GW (69%) of the country's 12.5 GW installed capacity. These substantial losses are a result of inefficient controls, monitoring technology and outdated infrastructure. Investment in proven end-to-end electrification technology will directly tackle the scourge of unemployment, poverty and inequality, creating an inclusive and prosperous Nigeria.

With uninterrupted access to electricity, businesses are more productive, hospitals provide better medical care, children receive a better education at school, and homes are safer and more comfortable. To make electricity more easily accessible to the whole population, power generation capacity must be ramped up and streamlined.

The Azura Edo Independent Power Project (IPP) helps to meet both of these criteria. This open cycle gas turbine will generate an additional 459 MW to the national grid when it comes online in 2018. Once fully completed, it is expected to add 3GW of additional capacity – accounting for approximately 20% of Nigeria's projected installed capacity by 2020. That is a massive increase in power generation for a country at Nigeria's stage of development.

ESI AFRICA, October 11, 2017

Eskom: A laggard in electricity transition

In South Africa, where electricity prices have quadrupled since 2007 and an expensive coal-fired power build-out threatens to drive prices even higher, renewables appear ever more appealing. Unfortunately, for the last two years

Eskom has been stonewalling on this front.

Eskom, South Africa's unlisted, state-owned electricity company, generates about 95% of the nation's electricity and about 45% of the electricity generated on the entire continent of Africa. Coal-fired generation produces 90% of South Africa's electricity. In recent years, South Africa has run a successful but limited renewable energy procurement programme. Renewable energy capacity of 2.2 GW has been completed to date, attracting more than US\$14 billion in investment.

Eskom, unfortunately, has recently stonewalled on this front, refusing to sign the deals while claiming that renewable energy is too costly. The company makes this assertion in spite of the fact that Eskom has benefited financially and operationally from its renewables programme.

One result of this intransigence is that an electricity utility has effectively been determining national energy policy. With solar PV and wind now significantly cheaper than new coal-fired generation in South Africa, Eskom may have unspoken motives for blocking additional renewables development.

One clue is Eskom's institutional commitment to a major coal generation build-out in the face of a declining South African electricity market. The utility is building two huge coal-fired plants, Kusile and Medupi, each with 4.8 GW of capacity with a combined cost to completion estimated at 448 billion rand. Meanwhile, higher electricity prices and sluggish economic growth have resulted in declining electricity demand. In its 2017 financial results, Eskom disclosed a 3.7% drop in electricity sales to the industrial sector and a 5.7% slide in sales to the agricultural



► sector. Eskom now has more than 5 GW of excess capacity, even before most Medupi and Kusile units become operational.

MONEY WEB, October 9, 2017

Freak storm in South Africa leaves residents without electricity

A freak storm has hit Gauteng in South Africa, killing one person. Homes, shopping malls, hospitals and schools were severely damaged on the West Rand. Stranded without electricity, the residents collected firewood from the trees that had been blown over. Several residents said their outside toilets were destroyed, leaving them without proper sanitation.

ALL AFRICA, October 11, 2017

THERMAL

Embargo placed on Ghanaian thermal power plant purchases

Ghanaian Vice-President Dr. Mahamudu Bawumia has said that the government is turning its attention to renewable energy hence no power purchase agreement will be entered by government with any entity. "Our goal, fundamentally, is to move Ghana away from the dependence on thermal energy towards renewable energy as the primary source of power for homes, offices and all public facilities.

"For this reason, our government has taken the decision and announced the policy that henceforth, the government will not sign any power purchase agreements for thermal plants for Ghana," he said. Bawumia, who identified strong production capacities as the missing link in building resilient economies in African countries emphasised the need for uninterrupted power supply to feed the manufacturing sector and for commercial use.

"Electricity drives our everyday applications in science and technology. Our homes, work place, health, private homes and production capacities depend on a large measure to access to power and we must work hard to keep the lights on and to also operate efficiently," he added.

GHANA WEB (GHANA), October 5, 2017

COAL

Coal can help address Egypt's intermittent renewable supplies

Egypt's appetite for energy is insatiable, with an annual demand growth rate of around 6%, although Egypt is blessed with an abundance of natural resources to supply the country's energy needs through energy produced from various sources oil and gas, renewables, and other resources such as coal and nuclear. Yet hydrocarbon development was always the cornerstone of the energy sector, as Egypt now needs to consider different sources of energy.

There is no doubt that an efficient energy sector is central to a prosperous Egypt. Energy challenges play an integral part in the country's current economic woes. Until only relatively recently, Egypt was a self-sufficient energy consumer, meeting its energy needs through local production. It has even been exporting both natural gas and electricity to neighbouring countries.

Since around two thirds of the country's electricity comes from gas plants, diversifying the Egyptian energy mix becomes a priority, the authorities in the last three years have started renewable energy feed-in tariff programmes, signed an agreement for the construction of Al Dabaa nuclear power plant, and approved the use of coal for power production.

DAILY NEWS EGYPT (EGYPT), October 11, 2017

NUCLEAR

Rosatom prescribes sustainable energy mix for Nigeria's power problem

Russian state nuclear energy corporation Rosatom has once again advised Nigeria to adopt a sustainable energy mix approach to its power system if it must achieve energy stability like Russia. Rosatom regional vice-president of Sub-Saharan Africa Viktor Polikarpov shared his country's energy sector best practices with participants of the event, insisting that the optimum energy mix for Nigeria was the way forward.

Also during a panel discussion on the optimum future energy mix for Nigeria, experts from across the globe discussed various options to close the country's current power deficit. Recent estimates from the International Energy Agency indicate that more than 115 million people in Nigeria still rely on traditional biomass and waste as their

main sources of energy.

With the country currently spending roughly between US\$14 billion on off grid diesel generation, it is abundantly clear that the country needs to diversify its mix. During the discussion, Polikarpov noted that for Nigeria to achieve a balanced energy mix, the country should consider all available sustainable sources of energy. Solar, wind, hydro and nuclear power complement and reinforce each other to form a green square, which will essentially become the base for the world's future carbon-free energy mix.

Polikarpov said that investing in nuclear projects stimulates national and regional cash flows toward the budget that often surpasses direct investments by a significant margin. Construction of NPPs also creates demand for thousands of locally sourced skilled labour, such as; welders, pipefitters, masons, carpenters, millwrights, sheet metal workers, electricians, ironworkers, heavy equipment operators and insulators, as well as engineers, project managers and construction supervisors.

VANGUARD (NIGERIA), October 11, 2017

HYDRO

Egypt fears disaster from Ethiopian dam

The only reason Egypt has even existed from ancient times until today is because of the Nile River, which provides a thin, richly fertile stretch of green through the desert. For the first time, the country fears a potential threat to that lifeline, and it seems to have no idea what to do about it. Ethiopia is finalising construction of the Grand Ethiopian Renaissance Dam, its first major dam on the Blue Nile, and then will eventually start filling the giant reservoir behind it to power the largest hydroelectric dam in Africa.

Egypt fears that will cut into its water supply, destroying parts of its precious farmland, hampering its large desert reclamation projects and squeezing its burgeoning population of 93 million people, who already face water shortages. Dam construction on international rivers often causes disputes over the downstream impact. But the Nile is different: few nations rely so completely on a single river as much as Egypt does. The Nile provides over 90% of Egypt's water supply. Almost the entire population lives cramped in the sliver of the Nile Valley. Around 60% of Egypt's Nile water originates in Ethiopia from the Blue Nile, one of two main tributaries.

Egypt barely gets by with the water it does ►►

► have. Because of its population, it has one of the lowest per capita shares of water in the world, some 660 cubic metres per person. The strain is further worsened by widespread inefficiency and waste. With the population on a path to double in 50 years, shortages are predicted to become severe even sooner, by 2025.

ASSOCIATED PRESS, October 8, 2017

RENEWABLES

JICA funds solar power plant in Hurghada with US\$60 million

The Japanese International Cooperation Agency (JICA) has approved funding a solar power plant in Hurghada for US\$60 million after the project was halted for over two years. Mohamed El Khayat, the chairperson of the New and Renewable Energy Authority (NREA), said that contracting took place with an advisor of the project to establish a solar power plant of 20 MW capacity. The tender will be offered for Arab and international companies to launch the project mid next year. The executive regulations will be completed in February.

He explained that the JICA has completed the project's feasibility study and provided a US\$1.5-million grant to place equipment in the plant's location with the aim of measuring the solar emissions to be sure about the project's feasibility during different times of the year and calculate the expected production at the implementation. Part of the financing is allocated for developing the centres of NREA.

The plant is considered the fifth of its kind after El Koraymat plant of 20-MW capacity, Kom Ombo of 200 MW, Kom Ombo of 200 MW, Hurghada of 20 MW with total 280 MW

of capacity.

A source in the Ministry of Electricity revealed that there were negotiations with the JICA that focus on technical cooperation to benefit from the Japanese technology especially in coal-fired electricity generation plants. With the last exchange of expertise being the visit of an Egyptian delegation to Tokyo. The delegation is composed of representatives of the Egyptian Electricity Holding Company, the Ministry of Electricity and the Environmental Affairs agency, with the aim of benefiting from the Japanese experience in the field.

DAILY NEWS EGYPT (EGYPT), October 10, 2017

Ethiopia to generate 250 MW of solar energy

Ethiopian Electric Power (EEP) has initiated an attempt to generate 250 MW of electric power from solar energy. Last week, the EEP floated a bid to hire a contractor to undertake the construction of the project. The project will be financed by the World Bank (WB). The tender will be opened on November 21, 2017.

Ethiopia is one of the countries that have potential to produce solar energy due to its proximity to the equator, as the World Bank indicates. This will be the second time when EEP moves forward to erect a solar power generating plant in the country. Currently, it is reviewing the documents of five bidders to select the main contractor for the realisation of the project in Methara.

In Ethiopia, only 8% of the rural population gets electricity, while 90% of the urban population have access to it, according to the Central Statistical Agency (CSA). Currently, the country generates 4,238 MW of power from water, diesel, geothermal energy and wind.

ADDIS FORTUNE (ETHIOPIA), October 8, 2017

Senegalese solar startup Oolu raises US\$3.2 million of funding

Senegalese solar startup Oolu has secured a US\$3.2-million Series A funding round, which will support its growth and strategy as it seeks to address the energy needs of more than 150 million people lacking access to electricity in West Africa. Founded in 2015, Oolu provides in-home solar kits composed of three adjustable lights and two USB plugs, powered by a battery that holds a charge for up to six hours with maximum output.

For a low monthly fee, paid through mobile money, the Y Combinator-incubated Oolu installs the system and performs any necessary maintenance, including free battery replacements and system upgrades. The US\$3.2-million funding round was led by Persistent Energy Capital (PEC), and was joined by Y Combinator (YC) and other seed investors. Oolu will use the money to further invest in its current operations in Senegal and Mali, and expand into a third market in 2018.

"This fundraise is an important milestone, and a further boost for us at a very exciting time for the company where we see real and significant opportunities in the West African markets," said Dan Rosa, co-founder and CEO of Oolu. "Today's announcement gives us great confidence that we are on the right track in pursuing our goal of becoming the leading energy and financial services provider in West Africa. We're delighted to have the support of quality investors like PEC and Y Combinator, and we look forward to working closely with them as we continue to grow the business."

DISRUPT AFRICA, October 9, 2017



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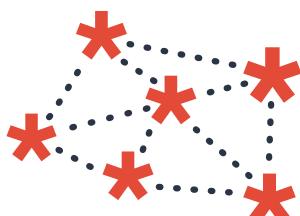
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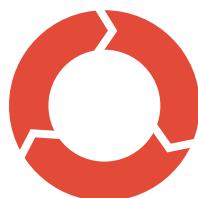


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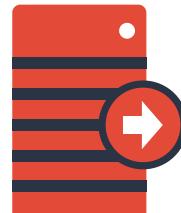


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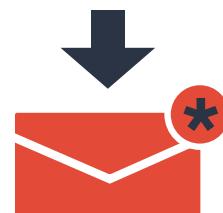


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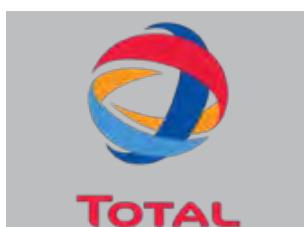


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