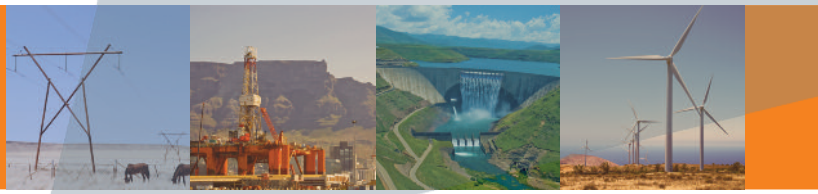
AFRICAN ENERGY Newsletter

Issue 431 · 28 January 2021
www.africa-energy.com



Project finance constrained as sovereign debt builds up

Policymakers agree more action is needed to counter debt distress and unlock funds for the energy transition, but there are few signs that a more effective financial architecture will emerge any time soon. Meanwhile concerns over rising sovereign debt are feeding into hesitancy over new lending, writes Jon Marks

Joe Biden's presidency offers the prospect of the world's largest economy re-engaging with the international order, with a raft of policies that include giving new impetus to climate change action, a more stringent attitude to autocratic rule and coordinating actions that stimulate economies in coronavirus distress (*AE 429/21*). Even before Covid-19 emerged a year ago, concern had been building over rising sovereign debt across Africa, some of it 'hidden' and unmanageable; this may now be an acute problem as emerging market and developing country (EMDC) governments signal varying degrees of distress (*AE 416/18*).

Biden's administration will be expected to join (and drive) a more coherent global response to countering debt distress in sub-Saharan Africa (SSA) and other vulnerable regions.

Among the more successful efforts to mitigate economic impacts of the coronavirus pandemic has been the World Bank Group (WBG)/International Monetary Fund-led Debt Service Suspension Initiative (DSSI). Since taking effect on 1 May 2020, DSSI has delivered some $5.7bn in relief to around 46 countries out of 73 eligible for a temporary suspension of their debt service payments to official bilateral creditors.

Originally set to end on 31 December, DSSI has been extended through to June 2021, and the initiative scored another important boost when China – which has traditionally avoided joining international initiatives – agreed to participate. However, the DSSI's future is in doubt after end-June. Some countries have avoided signing up, fearing ratings agencies would respond negatively. Benin did not take part as it planned a €1bn ($1.22bn) eurobond issue last year, which it finally announced on 12 January.

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Solar finance

Jersey-registered Brighter Life Kenya 1 Ltd, a local currency off-balance sheet financing vehicle set up to purchase solar home system receivables from d.light design inc's Kenyan subsidiary, has been expanded to $127m following a $15m investment by Norway's Norfund. The transaction, which follows $20m from the US International Development Finance Corporation, is a boost for d.light Kenya in its efforts to become financially sustainable and cashflow positive as it improves energy access to 1.9m people.

—SEE PAGE 5

Sudan hopes

A mid-January agreement between Sudan and South Sudan to expand oil cooperation has raised expectations of improved relations yielding material benefits for both states from the South's underutilised hydrocarbons reserves. Sudan's government, facing a cash and fuel crisis, is eager for the South to ramp up oil supplies. But Juba's upbeat forecasts of higher production look optimistic given the security and commercial considerations, and familiar obstacles are blocking concrete progress.

—SEE PAGE 13

Sassou seeks pre-election debt deal

President Denis Sassou Nguesso confirmed on 23 January that he would seek a fourth consecutive mandate when elections are held on 21 March. The 77-year-old president will again stand as candidate of the ruling Parti Congolais du Travail.

Before then Sassou is hoping for progress with Brazzaville's International Monetary Fund-led debt restructuring, agreed in 2019 but still incomplete (*AE 416/21*).

Brazzaville is expected soon to receive another IMF monitoring mission, which it hopes can be impressed by a restructuring of over $960m of debt owed to Trafigura.

Paris weekly *Jeune Afrique* reported this was being negotiated by senior government officials and Frédéric Fatien of Dubai-registered Worldwide Energy Marketing & Consulting. Nothing has been heard of a similar proposed deal to restructure $730m-plus of debt owed to Glencore.

Congo held a referendum in 2015 to remove an age limit of 70 for candidates and a ban on presidents serving more than two terms.

Sassou has cumulatively spent 36 years in power since he first became president in 1979, making him one of the world's longest-serving leaders.

ISSN 1463-1849

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Issue 431 • 28 January 2021

Incisive analysis since 1998

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Heavy costs and opacity raise concerns over Chinese debt finance

China's decision to participate in the World Bank-led Debt Service Suspension Initiative (DSSI) was a rare indication that Beijing was willing to join an international initiative to tackle rising financial pressures on developing economies (*see main article*). Its concerns about its African and other liabilities means Chinese lending "fell off a cliff in 2020", an AIX panelist observed on 19 January, but Beijing's commitment remains huge: the *African Energy Live Data* platform records some $38bn-worth of Chinese investment committed to African power projects in 2014-19.

Understanding the extent and quality of Chinese debt remains an inexact science. US and other critics characterise this huge investment as a geostrategic play, with 'debt trap' narratives to explain the provision of sometimes unaffordable loans, secured against assets that China might later seize.

However, *African Energy*'s analysis suggests the strategic imperative for securing power projects may rather be rooted in a desire to secure new export markets for Chinese state companies. While Chinese overseas investment has slowed markedly since 2017 – prompted by a cooling global economy, financial market pressures, international tensions, internal crackdowns on capital flight and Covid pandemic impacts – the pace of this slowdown has been less pronounced in Africa than elsewhere, and Chinese finance for energy projects seems to have defied the trend. While Chinese lending to sectors from ICT to retail and agriculture is down, Beijing's African energy facilities have held up.

Power sector facilities benefit from a very high degree of state involvement, led by the principal 'policy banks': the Export–Import Bank of China, China Development Bank and Industrial & Commercial Bank of China. Their loans have been driven by state-owned enterprises (SOEs) seeking new markets abroad to help absorb a huge oversupply of infrastructure capacity as China's domestic construction boom has wound down. SOEs dominate African electricity supply contracts underpinned by Chinese public support, leveraging long-term finance they would be unlikely to secure on a standard commercial basis – a competitive advantage when tendering for big-ticket hydropower or coal projects.

These facilities are often underwritten by the state-owned China Export Credit Insurance Company (Sinosure), which is willing to guarantee projects that commercial competitors might avoid. Chinese SOEs thus often exhibit much greater risk appetite when it comes to securing projects in difficult markets.

Despite Beijing's DSSI participation, Chinese financial flows remain distinguished by their opacity. Beijing releases very little information, in contrast to the norms established by traditional multilateral and bilateral lenders. *African Energy*'s analysis of existing data and research on Chinese lending suggests that possibly half of flows to developing countries are not picked up by major international databases. In addition, very little Chinese lending is concessional (as understood by international institutions' definitions of soft lending and grants), which means it is likely to be considerably more expensive than other official lending.

Yet countries line up to seek Chinese funding – studies have shown that recipients overwhelmingly initiate the process – encouraged that loans do not carry the same stringent socio-political or environmental conditionalities found elsewhere. This renders policy banks' loans more attractive to autocratic and repressive states, while transparency campaigners argue that opacity increases opportunities for malfeasance.

China claims its attitude to conditionality fits with its general policy of non-interference in other countries' internal affairs. Were Beijing to play a more coordinated and transparent role, managing the next generation of concerns over vulnerable sovereign borrowers' creditworthiness might become a good deal less fraught.

Marc Howard

Project finance constrained

CONTINUED FROM PAGE 1

Such was market appetite that the two-tranche Beninois bond was three times oversubscribed. But ratings agency downgrades for many SSA borrowers and the gloomy prevailing mood are probably a more realistic indicator of African economies' prospects of raising the funds required to make up the continent's infrastructure shortfalls.

In 2020, Fitch Ratings downgraded seven of the 19 SSA-rated sovereigns (Angola and Zambia twice), while seven of the region's 19 sovereigns were placed on negative outlook and another five are rated below B- (after which grade Fitch does not assign an outlook). Only Côte d'Ivoire is on positive outlook, in a gloomy situation that points to the risk of further downgrades. Autonomi Capital managing director Jonathan Berman told *African Energy*. "This is probably the first significant wide downgrade of the era since Moody's/S&P/Fitch ratings were done on most African countries."

Debt build-up

While the coronavirus pandemic has added to debtor government's debt burdens, concerns were apparent well before Covid-19. A WBG study, *Global Waves of Debt: Causes and Consequences*, was published in December but reflects the alarm building among economists well before then. Its analysis of three EMDC debt crises since the 1970s, and the build-up of debt from 2010 following the global financial crisis, shows that the last decade's global increase in debt has been larger, faster and more broad-based than in the previous three waves. EMDC debt had reached a record $55trn by 2018, equivalent to 170% of those economies' combined GDP. The biggest build-up was from non-Paris Club governments, of which China is dominant.

The WBG study estimates that the investment necessary to meet the global demand from infrastructure is between 4.5% and 8.2% of GDP, but SSA infrastructure needs – estimated at around $93bn/yr – are equivalent to 15% of annual regional GDP. "Even if major potential efficiency gains are captured, the region will still face an infrastructure funding gap of $31bn per year, mainly for power," the WBG said.

How this huge demand can be met remains a pressing question, while concerns persist over sovereign borrowing. A senior Johannesburg banker observed that South Africa's emergency power facilities alone were costed at around $4bn, in an economy whose own sovereign debt crisis has meant its bonds now have junk status.

Advocates of multilateral solutions have high hopes that new impetus will come from the Biden administration, but the outlook for international initiatives to overcome EMDC financial shortfalls remains unclear.

African debt could be raised up the G7/G20 agenda. The previous G20 Saudi presidency (supported by the Trump administration) sponsored the DSSI and some other Covid-related initiatives, but larger-scale coordinated action was limited, when compared with solutions advanced to tackle the 2007-09 crisis. There was worryingly little government or private sector creditor buy-in to African Union (AU) efforts to secure a wider debt deal, driven by UN Economic Commission for Africa executive secretary Vera Songwe and AU special envoy Tidjane Thiam.

The G20 called on private creditors to participate in the DSSI on comparable terms to bilateral lenders, but banks have yet to respond. Promises that Paris Club creditor governments will produce a response comparable to past debt restructurings show no signs of being met. China signed up for DSSI but will need to be better incorporated into a revised global financial architecture that many analysts see as necessary to meet huge demands for capital.

China still prefers bilateral deals to a multilateral approach. *Reuters* quoted the Chinese embassy in Nairobi as saying on 20 January that Beijing had signed debt service suspension agreements with 12 African countries and provided waivers for 15 African DSSI recipients. Kenyan finance minister Ukur Yatani Kanacho said on 22 January his country had secured a KSh27bn ($245m) bilateral debt repayment moratorium.

That debt issues have become very politicised was underlined by a Latin American deal announced by the US International Development Finance Corporation shortly before Donald Trump left the White House. Chief executive Adam Boehler said Washington would help Ecuador to repay billions of dollars in loans to China and boost American support for Ecuador's President Lenín Moreno in exchange for excluding Chinese companies from its telecom networks. This initiative may survive the change of administrations in Washington.

Slow-burning crisis

Participants who debated sovereign debt issues at an *Africa Investment Exchange (AIX) panel* on 19 January agreed that rising debt pressures and a wider "crisis of political economy" were of deep concern but a full-blown African debt crisis had yet to emerge.

There are concerns over an overhang of potentially problem debt, booked as contingent liabilities (CLs) in countries including Kenya, Mozambique and Zambia, whose governments have revealed ever larger quantities of debt, often contracted from China. Episodes such as Mozambique's tuna bonds scandal (*AE 402/20*) have added to perceptions not just of rising debt but also of wider crises of poor governance. This was underlined by Zambia's President Edgar Lungu's government triggering a sovereign default by refusing to make interest payments to bondholders, with little sign it will do a deal before elections in August (*AE 428/21*).

Perceptions of potential new debt problems and governance shortfalls may be holding back important investment decisions. There is continued huge demand for the WBG, its Multilateral Investment Guarantee Agency arm and other multilaterals to underpin projects across the continent, but even these institutions have been tightening their risk assessments and are more selective in providing loans and risk mitigation.

Official private equity and other bilateral development finance institutions (DFIs) have trimmed their risk appetite. One AIX participant observed that bilateral DFIs still tended to seek multilateral guarantees, despite their official creditor status. While the global development narrative has long called on private funding sources to scale up support, banks and investors are cautious.

Low-income countries have increasingly borrowed from outside the traditional Paris Club lenders, notably from China. "Some of these lenders impose non-disclosure clauses and collateral requirements that obscure the scale and nature of debt loads," the WBG's *Global Waves of Debt* said with some understatement. Through the DSSI process, the WBG and its partners have a much better understanding of how much debt paper governments are holding, but there are limits: too many CLs due to non-traditional and private creditors remain opaque.

These problems predate Covid, the AIX panel was told – and "sovereign downgrades mean exorbitant interest rates", which have huge impact when, as a banker observed, "debt costs can account for 60% of any highly geared infrastructure project". Those costs feed into the tariff – hence the demand from banks to secure support from the WBG, African Development Bank and others who can offer lower-cost finance.

CLs may be controllable, as they have yet to become problem loans, but they become direct liabilities when projects start up and fail to generate funds – an issue in markets such as Ghana and Zambia, where governments have signed up to generation projects that are not needed.

Reasons to be cheerful

Efforts to mobilise huge new funds for the energy transition and climate change mitigation are expected via this summer's G7 meeting, COP26 in November and other government initiatives (*AE 430/21*), but creating this new economy will require a step change in financing approaches. Consensus among the AIX panel was that progress is being made in some areas, but was overall too little to meet the challenge. Among positives presented to the AIX panel were:

- good projects can still secure finance – Mozambique's tuna loans scandal highlighted issues of hidden debt, but has not stopped financing for new gas and solar projects. In Mozambique, the WBG is structuring a $120m gas-to-power project with Sasol and Globeleq. The same is true for other economies that have experienced debt problems but have the ability to structure impactful projects;

- transmission and distribution (T&D) rise up the agenda – multilaterals are especially keen on supporting projects that promote regional integration, as efforts move ahead for T&D to get the sort of support previously reserved for generation (*AE 405/6*);

- local currency financing – another regular call from developers is for more use of local currency loans. Initiatives like the Private Infrastructure Development Group's GuarantCo provide welcome support, but nowhere near what is needed. The WBG is looking to engage with local banks;

- small is beautiful – the roll-out of smaller-scale renewables projects gives scope for increased private sector lending and risk mitigation. This is especially important in a situation where a legal source said he could "see no mid-size project without a sovereign guarantee". Trends toward increased decentralisation, off-grid energy and private investment in renewable generation favour smaller or more modular investments, with less reliance on state utility and government balance sheets. Projects are lining up, including an upcoming 40MW solar tender in Eswatini. While governments still tend to focus on larger projects of the sort that have raised sovereign debt concerns, even troubled utilities are finding they can secure power purchase agreements for smaller-scale projects. Berman told *African Energy:* "This is rational as small investments don't cause the short-term absorption challenge of a large plant and if new generation RE tariffs produced are lower than the cost of existing supply from a state owner or IPP generation, they may in any event be higher in the merit order."

Kenya's d.light receivables vehicle grows to $127m

An investment by Norfund has bolstered a receivables vehicle run by Solar Frontier Capital for d.light in Kenya, in one of the first large-scale transactions for the sector. The transaction is a boost for d.light Kenya in its efforts to become financially sustainable and cashflow positive, writes Dan Marks

Jersey-registered Brighter Life Kenya 1 Ltd (BLK1), a local currency off-balance sheet financing vehicle set up to purchase solar home system (SHS) receivables from d.light design inc's Kenyan subsidiary, has been expanded to $127m following a $15m investment by Norway's Norfund. African Frontier Capital (Mauritius) LLC's Solar Frontier Capital Ltd (SFC), d.light and Norfund announced the new senior debt package on 21 January.

Norfund joins the United States International Development Finance Corporation (DFC) as a senior lender to BLK1. DFC is providing a $20m debt facility to the vehicle. BLK1 is expected to finance the provision of improved energy access to 1.9m people living off-grid in Kenya and to displace 600,000 tons of greenhouse gas emissions.

"BLK1 provides us with the flexible local currency receivable financing we need to make our Kenyan business sustainably cashflow positive. Being cashflow positive is a key metric of business sustainability and will enable us to grow and to impact many more lives in Kenya for the long term," said d.light chief executive Ned Tozun.

BLK1 was set up by SFC to acquire pay-as-you-go (PAYG) accounts receivables for SHS customers in Kenya from d.light on a periodic basis, providing a ready local currency cashflow for d.light. This allows d.light to reinvest the proceeds while providing a longer-term income stream for BLK1. The $127m figure is the face value of receivables BLK1 is forecast to acquire from d.light in Kenya over the next few years.

Off-balance sheet vehicles for receivables have been discussed for some time in the SHS industry to help accelerate growth, but progress has been slow (*AE 359/5*). "Off-balance sheet receivables financing has been more or less non-existent at a large scale before this transaction," Norfund senior associate Kristoffer Valvik told *African Energy*. "There have been a few smaller transactions, but none of these were even close to the scale that we have here with d.light. This is the first one that's taken it to a scale where it becomes commercially viable."

SFC was established in 2017 with partial funding from the United States Agency for International Development (USAID) Scaling Off-grid Energy Partnership Programme as an impact investor in receivables financing for SHS companies. Its parent

company African Frontier Capital had been approached by similar companies previously to invest in debt and equity rounds.

"As primarily an infrastructure and real asset investor at the time, we couldn't get our heads around the valuations of the equity in these companies, which were being driven by venture capital companies. When it came to investing in debt, the companies were still young and growing very quickly, so investing in on-balance sheet debt to finance working capital receivables seemed like the same risk as equity, just a different return," African Frontier Capital chief executive Eric De Moudt told *African Energy*.

"But the sector has a huge social impact so we wanted to figure out how to get involved. That's why we set up SFC, to provide receivable funding in securitisation type structures, then for d.light it was a fairly straightforward pitch to provide them with ongoing local currency receivable finance."

SFC began talking to d.light and other SHS companies about purchasing their receivables as an independent third party and closed an initial $65m deal in May 2020. SFC acts as the subordinated lender, master servicer and sponsor to BLK1.

Allen & Overy LLP, Kaplan & Stratton, and Walkers (Jersey) LLP advised on the transaction.

Maturing market

Establishing off-balance sheet receivables financing structures is a difficult and expensive process, involving substantial legal fees. As a result, the small scale of most SHS companies has been a barrier to establishing receivables vehicles to date. De Moudt believes that the sector may now have crossed the threshold that will make receivables financing viable.

"The top companies in the sector are only now getting to the scale where that initial investment in establishing the structure is justifiable from a commercial perspective," De Moudt said. "One of the things that we did with the assistance from USAID was to absorb a lot of those initial costs, taking that risk ourselves to make the decision easier for d.light. That kind of learning scales."

Without receivables financing, SHS companies operating a PAYG model risk getting into financial difficulty. De Moudt points out that whenever a company sells a product it finances up front and only receives a proportion of the funds back as a deposit with the rest repaid over time. A fast-growing company can easily run into cashflow problems where money coming in from repayments is not enough to fund upfront product costs and the company must rely on increasing volumes of debt.

"Another way to say it is that this facility reduces d.light's on-balance sheet working capital needs," Valvik said.

Approach advantages

The rolling nature of funding from BKL1 acquisitions, periodically purchasing batches of customer receivables, is one of the main benefits of the structure, according to Valvik. "d.light has been going out to various lenders and getting large on-balance sheet facilities which is quite time consuming, the disbursements don't really match when cash is required, and the repayment schedules don't match when they have the cash, whereas this is really set up to match their financing needs," he said. Financing in local currency improves that match, with SFC hedging the dollar loans.

"Speaking more broadly, if you have on-balance sheet debt then usually there is a big sum of dollars due in two or three years. That's a refinancing risk that is potentially existential," De Moudt added. "When you sell receivables there is no refinancing risk, you've done the deal and if the cash advance rate is sufficient to make you cashflow positive then you have a financially sustainable business."

One challenge that has faced receivables investors is maintaining portfolio quality by ensuring that customers are adequately vetted and engaged so that the default rate does not get too high. Many insiders have warned that investors using tick-box approaches to portfolio due diligence risk sub-prime-like defaults in the future. According to De Moudt, this is one of the advantages that third party vehicles bring.

"We act as master servicer in the transaction, so when we purchase assets from d.light, BLK1 contracts with d.light to act as a servicer. Then we as an independent third party are plugged into d.light's data systems, so we can monitor on a daily basis the performance of the underlying receivables. That's a key point," he said. "When you are doing due diligence on a company overall it is very hard to see the performance of the underlying receivables. A vehicle like this makes due diligence for an institutional or commercial investor very easy because you can look cohort by cohort and see: here is the receivable purchased, here is the cash received. The repayment profiles are very easily discernible."

Valvik added: "As an investor coming into this, we have access to all the historical performance and can see all of the cohorts and how they are performing. d.light has hundreds of thousands of existing customers and you can track the individual customer and aggregate the payment performance and use that to project how payments are going to perform going forwards. The vast amount of data available can give quite a lot of comfort to investors."

While BLK1 investors have so far been development finance institutions (DFIs), they are lending at commercial rates and SFC ultimately aims to bring in commercial institutional investors. "This model is not dependent on concessional funding, but it does need DFI funding," De Moudt said. "We think that the pricing is roughly where the market would be; we've gone through some of the process of price discovery with commercial and institutional investors. It's definitely reliant on DFIs like Norfund and DFC to take the risk and get this up and running. It's our objective to bring increasing amounts of commercial and institutional investment into this space."

Valvik added: "Before BLK1, activity in this space has been quite limited. We need to add a significant proof point to show that this actually works before we can bring in commercial capital. We want to show that this is the most suitable option for the sector."

Blended approaches are also a possibility, with guarantees or with commercial investors coming in as senior lenders and DFIs providing junior debt. The extra visibility on repayment profiles made possible by the off-balance sheet approach might ultimately allow the portfolios to be rated by ratings agencies, which might allow risks to be allocated across tranches to create an investment grade senior tranche.

Kipeto start-up

Project company Kipeto Energy Plc (KEP) announced on 25 January that it had connected the *Kipeto wind farm* in Kajiado County to the national grid and the project would start generating power in the next week. KEP has connected a 17km, 220kV high-voltage transmission line linking the facility to the national grid at the Isinya substation.

The project's 60 GE 1.7-103 wind turbines, each capable of producing 1.7MW, will be switched on in stages as part of a ramp-up process, with all commercial tests due to be concluded within the next few months.

Kipeto, which reached financial close in December 2018 (*AE 383/8*), is funded by equity from Actis-backed BioTherm Energy (88%) and Kenyan company Craftskills Ltd (12%) alongside senior debt from the US International Development Finance Corporation. When fully commissioned, the project will generate 100MW under a 20-year power purchase agreement with Kenya Power.

While securing land rights has frequently been a challenge for Kenyan power projects, KEP said it had leased and secured more than 60 plots within the project area for the wind turbine footprint and the transmission line through voluntary participation of landowners.

Initiatives have included constructing new housing for local families outside the project's 500-metre buffer zone, supplying schools with personal protection and sanitisation equipment as protection against the coronavirus pandemic, drilling community water boreholes, and establishing a youth vocational skills training programme to increase employment from within the local community.

More than 800 jobs were created during the construction phase of the project and an additional 60 permanent jobs are projected during the operational phase. Around 200 families are expected to benefit directly from the turbine revenue located on their land, with the company establishing a community trust to oversee further distribution of profits to the wider local area, KEP said.

TANZANIA

Consulting services sought for Malagarasi

Tanzania Electric Supply Company Limited (Tanesco) is seeking an engineering consultant to assist with construction of the *49.5MW Malagarasi hydropower plant* in Kigoma region, western Tanzania. Expressions of interest are invited by 16 February.

The scope of work includes design review and preparation of bidding documents and support in procuring contractors for plant design, supply and installation. It also includes supervision of works comprising the Malagarasi hydropower plant; a 132kV, 54km transmission line from the plant to the Kidahwe 400/132/33 kV substation; and distribution network expansion and rural electrification consisting of 40km of medium-voltage lines and around 65km of low-voltage reticulations to increase the 33kV dispatch capacity from the Kidahwe substation and serve communities near the power plant and the transmission line route.

The African Development Bank approved a $120m loan in November 2020 towards the $144m cost of the project. The run-of-river plant on the Malagarasi River will essentially operate as a baseload plant, generating average annual output of 181GWh.

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NIGERIA

Globeleq gains foothold with C&I company acquisition

UK-based developer Globeleq announced this month that it has acquired a 74% stake in Nigerian commercial and industrial (C&I) power company CPGNL. CGPNL was owned by Clean Energy Group, which will retain 26% of the company, and used equipment supplied by Cummins. The company will be rebranded as Globeleq Power Solutions Nigeria Ltd (GPSN).

GPSN has a portfolio of 12 operating gas power plants with combined capacity of 58MW in the south of the country. It has three plants in construction with 9MW of capacity and around 100MW of projects in development. Globeleq intends to take a light-touch approach to the business, but its access to capital will allow for more rapid expansion. CPGNL uses an IPP model, financing construction upfront and earning the investment back through power purchase agreements.

The transaction is the first foray into the C&I business for Globeleq and has been around two years in the making. But

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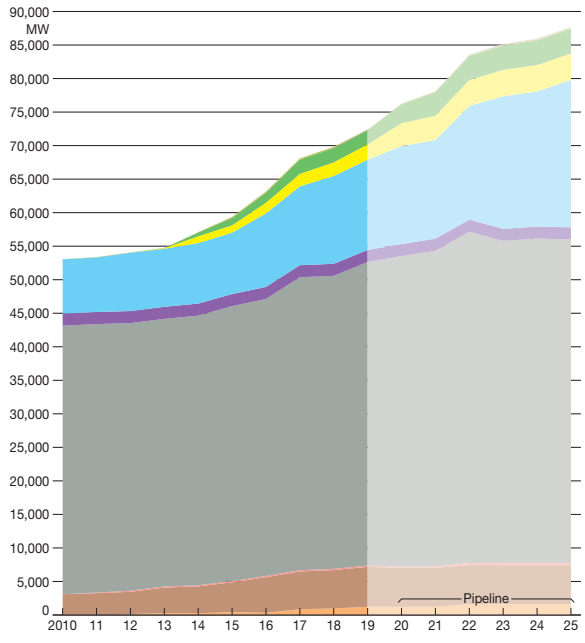
SOUTHERN AFRICA ON-GRID ENERGY MIX, 2010–25



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while the company has been assessing C&I opportunities, the GPSN acquisition emerged primarily from Globeleq's Nigeria strategy. Globeleq has been involved with solar PV projects and the 540MW gas-fired *Qua Iboe Power Power Plant* (QIPP) for several years but has faced long delays while fundamental issues with the electricity market are resolved. The company has been looking for a way to build its credentials in the country and strengthen its presence on the ground.

"We've looked at a number of C&I opportunities outside of Nigeria where we thought it made sense but none of them have moved forward," Globeleq head of Western Africa Alex Douglas told *African Energy*. "I think Nigeria is particularly well suited to C&I because of the unreliable nature of the grid. We are not giving up on our grid-connected projects, in fact, we see this as complementary to our approach in Nigeria and a really good opportunity to get a market presence."

GPSN's substantial portfolio was a major part of the attraction for Globeleq, which has an operating portfolio of utility-scale power plants in Africa with combined capacity of more than 1.4GW. "The existing scale was interesting, but then also the calibre of the platform – the people and the potential to expand – was really important," Douglas said. "It's got near-term growth prospects which are very strong and potential to branch out more into renewables and embedded generation.

"There is a perennial question as to the scale needed to make a project work, both with utility-scale projects and C&I: what should be your customer and project size? Along with the rest of the market we are sometimes moving smaller, with the question then being: can you roll the projects together to get critical mass? But we're certainly much more flexible than we used to be in terms of the size of the projects that we'll look at."

Douglas believes there is significant potential for fuel displacement in Nigeria using renewables. "Nigeria is hard in many places to move fuel around, so it can make sense to use renewable hybrid plants," he said. "Some customers – current and future – are interested in that as well for environmental credentials. We would also look at 100% renewable plants in some circumstances."

Despite this, Globeleq expects the business to continue to include gas. GPSN's existing plants are supplied by a mix of pipeline gas and compressed natural gas (CNG) from trucks. This limits its range of operations given the limited extent of pipelines and challenges supplying larger power plants using CNG. Douglas expects hybrids to play more of a role in northern regions, which are further from the coast and from the country's gas resources.

Douglas said GPSN was unlikely to expand outside Nigeria in the near term. "I think this is quite a Nigeria-specific play and opportunity," he said. "This is new for us and we're keen to explore its potential in Nigeria and provide innovative power solutions to the Nigerian C&I space.

"We don't see C&I as a homogeneous market across the continent, there are places that are better suited to it and they tend to fit the mould of Nigeria, struggling to get reliable electricity to industrial consumers. We are interested in looking at C&I in those places over time but there isn't a set rollout plan for doing that. It's not obvious how a lot of the utility-scale IPP blockages will be solved on the continent so these opportunities may be around for a while."

Globeleq does not intend to interfere with the day-to-day business, instead encouraging a greater focus on long-term and renewable projects while learning more about the C&I business from the GPSN team. Longe Alonge, former head of power procurement and power contracts at the Nigerian Bulk Electricity Trader and development director at Black Rhino Development Group, will be leading Globeleq's business development efforts at GPSN and QIPP.

REPUBLIC OF CONGO

Supply crunch adds to pressure on the system

Domestic consumption has reached a new record of 550MW – with most demand in the main cities of Brazzaville and Pointe-Noire – compared to national generation capacity of only around 400MW from Republic of Congo's main power stations, state Société Energie Electrique du Congo (E2C) distribution director Jules Saturnin Souka told *African Energy*. Solutions include installing a third gas turbine at Eni's gas-fired plant in Pointe-Noire – expected later this year – and strengthening the national transmission and urban distribution network, for which funding has been sought.

E2C's main generation sources are the 314MW Centrale Electrique du Congo *gas-fired plant in Pointe-Noire*, and around 50MW each from the Imboulou and Moukoukoulou hydroelectric power plants, whose output is lower than their installed capacity.

"Demand is now significantly higher than supply," Saturnin said. "We are load-shedding to preserve equipment which is operating at its capacity. If we let people consume [electricity] at will, our cables and transformers are going to burn. So that we don't participate in this disaster, it has been necessary to put in place a programme of power cuts and disconnections."

The Mongo Kamba transmission station outside "can only work to its capacity", explaining cuts in Pointe-Noire between 18.00 and 22.00, and infrastructure serving Brazzaville is similarly limited. Some 40% of substations serving major city neighbourhoods (with 630kVA capacity) are overstretched.

Strains on the system were dramatically underlined in December when the population of north Brazzaville's Itatolo neighbourhood panicked when an E2C transformer caught fire and exploded. It was the latest in a number of such incidents in the past year.

Saturnin said solutions included installing a third 170MW gas turbine at Eni's gas-fired plant in Pointe-Noire, which is scheduled for August. "You could say that by the end of the year the problem will be solved as we should have exactly 550MW" generation capacity, he said.

He said the government was working with its partners to strengthen the transmission link from Pointe-Noire to Brazzaville. E2C is looking to purchase transformers with total 70MW capacity to reinforce the grid and output from the facilities supplying Brazzaville and Pointe-Noire. E2C has also acquired new equipment for some 20 substations.

Saturnin said the government was working with the World Bank on a project that would install 40 new substations in Brazzaville and 20 in Pointe-Noire. The World Bank has not yet put details of this project into the public domain.

Managing consumers remains a major issue, with E2C's income undermined by illegal networks that steal power from the grid and the population's widespread rejection of meters. "We are going to continue to install meters so that every household pays for what it consumes. While people continue to 'redistribute' [power] there will always be power cuts," Saturnin said.

BOTSWANA

Abridged IRP released

Botswana has released its 2020 integrated resource plan (IRP), which provides policy scenarios for the generation mix until 2040, approving procurement of 795MW of new capacity at the same time. This includes 135MW of solar PV to come online next year, and 10MW-100MW of coalbed methane generation (CBM) by 2025. Procurement is well under way for both technologies, with five bidders submitting proposals for two 50MW plants in December and Tlou Energy and Sekaname both negotiating CBM projects with the government. A further 35MW is being procured from smaller solar PV plants.

The government also intends to begin procurement this year for a 200MW concentrated solar power (CSP) project and has announced its intention to begin procurement for 300MW of coal power as soon as possible, both to be online by 2026 (*AE 423/3*). The latter has been greeted with some scepticism after failed procurement for Morupule B units V-VIII and with financing becoming increasingly difficult.

Procurement for a 50MW wind plant is expected to begin in 2024 for commercial operations in 2027. A further 100MW of solar PV is expected online in 2027, with procurement beginning in 2025.

Overall, the government's preferred scenario would see 300MW of coal, 250MW of CBM, 600MW of solar PV, 200MW of CSP, 50MW of wind and 140MW of battery storage. While battery capacity increases significantly under the scenario, none would be added until 2032, after which it would grow rapidly.

The IRP looked at three demand and three generation scenarios, running from 2017 to 2040. Its preferred scenario assumes slower growth in electricity demand because of an anticipated reduction in diamond mining, with the mining sector's share of GDP falling from 22.2% to 7.3% over the period, and the introduction of new technologies and energy-efficiency measures. The scenario forecasts an increase in electricity demand from 3.477TWh in 2016 to 7.738TWh in 2040.

The preferred generation scenario aims for Botswana to change from a net importer to a net exporter of at least 10% of electricity generated by 2035. Generation was restricted to using domestic resources, which are dominated by coal and solar power. Botswana has estimated coal reserves of more than 200bn tons. The country also has one of the best solar resources in the world, receiving more than 3,200 hours of sun each year and an average isolation of 21MJ/metre on a flat surface. Wind resources also have potential in the south-west and east, with average wind speed of more than 7m/s and wind density of more than 200W/m^2.

The government said adopting the self-sufficiency approach would reduce the share of coal generation in the mix from 99% currently to 61% in 2040 and enable Botswana to become a net power exporter from 2026. Carbon emissions from electricity generation would peak in 2026 and stabilise thereafter.

SOUTH AFRICA

TBI enters renewables market

South Africa's TBI Investment Managers has completed its first renewable energy deal with a R440m ($29m) refinancing of Emvelo's 15% equity stake in the *100MW Karoshoek Solar One* concentrated solar power project, which came online in 2018. The deal was done through TBI's Amandla Renewable Energy Fund, which was set up in 2019 to focus on refinancing equity stakes in South Africa's renewable energy IPP procurement programme (REIPPP), TBI head of renewable energy Laurentius Human told *African Energy*. TBI is the lead investor in the fund along with Momentum Metropolitan Holdings. ABSA Bank stepped in as a co-financier in this transaction.

"The fund was created because we see the secondary market is evolving in South Africa as more renewable power assets reach maturity. Refinancing is becoming more and more common. There are about 120 projects and 300 players in the ecosystem from banks to funds to equity holders and trusts. We saw this opportunity and structured a fund to be able to participate in this," Human said.

The refinancing enables Emvelo to pay off its current financing with the Industrial Development Corporation of South Africa (IDC). It is part of IDC's stated mandate as a development finance institution to take risk and fund early-stage projects and then look to exit them once they are operational. Refinancing

is made possible due to the lower risks involved in financing an operational plant, though Human said there were still risks incurred by the fund.

"There are three categories of risk in any renewable energy project, the first being the construction risk, which is the big risk as no income is being generated during this period. Once operational, the first two years of the plant is where any problems will become visible, if there are equipment problems, land problems or resource problems. After this your risk comes down to will the natural resource be there consistently? Will the sun shine the way it was statistically forecast to? Will the equipment last? Because over time you'll run out of equipment warranty. There is also plant operator risk. Will they be able to operate the plant within the cost parameters? And you take a risk on the country or the offtaker. These are the risks we would look at, which are a lot fewer than the funder would have to look at before construction.

"For this reason, funds aim to acquire several deals across the market. The Amandla fund size is R4bn and you need that size to do equity refinancing. A big hurdle is having enough access to capital because transaction sizes are about R500m or larger. We took some time to make sure we can do the volume of transactions we wanted to do," Human said.

With renewable assets in South Africa only just beginning to mature, the number of players involved is relatively small, but the market is still very competitive as the quality of assets is high, Human said. The assets have a 20-year power purchase agreement which within the REIPPP is government guaranteed and has an inflation-linked income stream. The big South African banks like Old Mutual, Standlib, Momentum and Sanlam are large enough to have the necessary capital and all compete for transactions. Transactions and returns are in South African rand, so there are few direct international participants.

"You do need to take this in the context that South Africa has faced significant headwinds towards economic growth and battles with high unemployment. Even prior to Covid-19 the economic picture was quite bleak. To raise a fund and get investors and have a value proposition, you're not just looking at the renewable ecosystem but also satisfying investors that your returns will be solid and as good or better than the returns they would get in other industries like mining or property. To raise a fund you need to compete against all the other industries that also want to raise money. Here competition is also stiff. The renewable energy finance market is delivering competitive returns and that's attractive. That's why bigger balance sheet players are active in this sector," Human said.

Reports of expedited procurement

Reuters reported on 26 January that the South African government planned to launch multiple procurement rounds for solar, wind, gas, coal and battery power over the next year. The news agency cited a report made at a three-day meeting of African National Congress officials which set out plans to launch a 2.6GW solar and wind procurement round this month or next, followed by a further 2.6GW procurement in August and a third round in January or February 2021 for 1.6GW. Alongside the renewable procurement rounds, tenders would be launched for 500MW of energy storage in September and for 1.5GW of coal and 3GW of gas in December.

The plans would represent a marked change from the government's caution to date and would likely stretch the capacity of the IPP Office to the limit. Bid window 5 of the renewable energy IPP procurement programme is already behind the schedule IPP Office officials expected in 2020 (*AE 423/1*). Meanwhile, the LNG-to-power programme has remained largely dormant since a public information memorandum was issued in 2016, with many of the officials no longer involved.

Meanwhile, coal power procurement has proven highly controversial after two previous projects fell apart following environmental challenges and difficulties raising funds. The government has said that any new coal would have to use high-efficiency, low-emission technology (HELE). This approach has been criticised as HELE technologies are largely unproven and previous attempts to introduce cutting edge technology at the giant Medupi and Kusile coal projects backfired spectacularly.

ZIMBABWE

Kariba dam works on course for 2024 completion

Two sets of rehabilitation work on the Kariba dam are progressing on schedule and will be completed before the end of 2024, the Zimbabwe River Authority (ZRA) has said. Work on the Kariba Dam Rehabilitation Project comprises reshaping the plunge pool and refurbishing the spillway gates to enhance the structural integrity of the dam wall.

The dam, on the Zambezi River, was built between 1955 and 1959. The rehabilitation work follows concern about water from the spillway eroding the basalt bedrock on which the dam was built. ZRA chief executive Munyaradzi Munodawafa said that, contrary to widespread public opinion, the main objective of the project was not to seal cracks in the dam but rather to increase the lifespan of the dam wall.

Work to reshape the plunge pool began in May 2017 and is being carried out by French engineering company Razel-Bec (*AE 341/5*). "The works are targeted for completion before the end of 2024. The project is on course and the works are 60% complete," Munodawafa said in an update. The work involves excavation of the rock in the plunge pool to increase the pool volume and minimise erosion which could undercut the dam foundations.

Munodawafa said spillway refurbishment works, which commenced in September 2019, were being implemented by a consortium of General Electric Hydro France and Freyssinet International (*AE 396/11*). The works are due to be completed by 2024.

Munodawafa said the spillway refurbishment contractor was on site, working on establishing construction site facilities as well as fabricating the electro-mechanical equipment required for execution of works through specialist subcontractors. While the project was minimally affected by the first wave of the Covid-19 pandemic, the current second wave of infection has not yet hindered progress, Munodawafa said.

ZRA will be installing high-tech equipment before May 2021 as part of works relating to the dewatering of the plunge pool, which is expected to commence in Q2 2021. The equipment will be used to monitor the execution of the works and any impact on nearby infrastructure, including the dam wall itself.

ZAMBIA

Covid delays Kafue Gorge Lower completion

The completion date for the $2.3bn Chinese-sponsored *Kafue Gorge Lower (KGL) hydropower scheme* in southern Zambia has been pushed back after a surge in cases of the South African coronavirus strain.

Planned to produce 750MW on completion, KGL will be Zambia's third biggest power station after the 1,080MW Kariba North Bank and the 990MW Kafue Gorge Upper and will help to reduce the current 810MW supply deficit. The country is suffering under daily power cuts of up to six hours as it is unable to pay for imported power.

KGL was initially planned for commissioning in April 2020 but completion was affected by global travel restrictions imposed to limit the spread of the virus and, in the last few weeks, Zambia has seen a significant increase in new cases.

In November 2020, state power utility Zesco announced that it had completed the filling of the water reservoir at the KGL site in readiness for commissioning in December. But work remains uncompleted. "There is no activity taking place on site – it is like a quarantine centre; no one is being allowed into the plant or to leave," one worker at the construction site told *African Energy*.

"At the time the dam was being filled, there were some components that needed to be installed on the first turbine before we could fire it, but that component delayed from China and that contributed to the delay in the commissioning of the project."

KGL is being developed jointly by Sinohydro and Zesco, with Chinese loans to the project of around $1.7bn (*AE 414/7*). The site worker said the Chinese managers at the construction camp were yet to give indications of when the first turbine would come on stream.

Zesco spokesman John Kunda told *African Energy* the completion date was still under revision.

"We don't know to what extent and how long it will take for this Covid-19 to be resolved. Even experts are being restricted access to the site for now and so, at a technical level, it is not

COUNTRIES AND MARKETS

GHANA: 700kWp Miniplast rooftop facility operating

Plastics manufacturer Miniplast Ltd has begun commercial operations at a *700kWp grid-tied solar PV plant* developed and built by Stella Futura at Spintex Industrial Area in Accra. The plant is funded by Empower New Energy, the owner and asset manager, which sells power to Miniplast through a 20-year power supply agreement. The plant is expected to generate 1.1GWh/yr. Miniplast signed a contract for power from the plant in February 2020, with Empower joining the project in September to provide financing.

KENYA: KenGen seeks bids for solar panel plant

Kenya Electricity Generation Company (KenGen) is inviting bids for the design, supply and installation of a silicon-based solar PV panel production plant at the company's Tana power station in Murang'a, central Kenya. The plant is expected to have annual production capacity of 5MWp-10MWp. The successful bidder will also be required to train KenGen employees to manage the plant after project commissioning. Submissions are due by 15 February and a mandatory site visit is scheduled for 2 February.

Contact: Supply Chain Director, KenGen. Tel: +254 20 3666000; Email: tenders@kengen.co.ke, cc pmutua@kengen.co.ke, pwambugu@kengen.co.ke.

MALI: Kourouba dam inaugurated

Prime Minister Moctar Ouane formally inaugurated the Kourouba dam in the Koulikoro region of south-western Mali on 15 January. The structure's main aim is to raise the water level of the Sankarani River to allow for irrigation but it also includes a 3.9MW hydroelectric power plant. The project was built by the China Geo-Engineering Corporation with financing from the African Development Bank and developed as part of the government's irrigation development programme for the Bani Basin and Sélingué.

REGION: Aker Horizons takes 75% of Mainstream

Norway's Aker Horizons has taken a 75% equity stake in Mainstream Renewable Power. The deal, valued at about €900m ($1.095bn), should enable Mainstream to bring 5.5GW of power to financial close by 2023. The other 25% equity is held by Mainstream founder and chairman Eddie O'Connor. The transaction is expected to close in Q2 2021, dependent on regulatory and creditor approvals. Mainstream has been active in Africa since 2009 and has an office in South Africa. It is a 40% equity holder in Lekela Power, which commissioned the *107.8MW Perdekraal East Wind* in October 2020 and *140MW Kangnas Wind* in November 2020. It has commissioned 848MW of wind and solar through South Africa's renewable energy IPP procurement programme and currently has a 5.5GW portfolio in the continent.

clear to state exactly when we shall be able to fire the first machine, but it should be pretty soon," Kunda said.

"We should have switched on the machine in December but there was a component missing… it only came in in the first week of January this year, then they fired up to test run and currently what we are doing are the reliability tests to ensure the machines run seamlessly when we start synchronising them to the national grid."

ALGERIA

'Renewables Sonatrach' planned

Energy minister Abdelmadjid Attar said on 25 January that Algiers was preparing to create a parastatal renewable energy company along the lines of state hydrocarbons giant Sonatrach. Attar told national ratio that his ministry – and apparently not the renewable energy ministry created last year – was planning a "second Sonatrach" to manage the new technologies.

Meanwhile, Attar said state utility Sonelgaz was in financial crisis due to selling electricity and gas too cheaply, with its income now insufficient even to meet operating expenses. Successive Algerian administrations have failed to tackle this longstanding structural problem, but Sonelgaz on 18 January finally announced it would cut off bad payers.

Sonelgaz communications chief Fatima Zahra Zerouki said AD160bn ($1.2bn) was owed to the utility as at end-2020, 53% from private consumers and 47% by the public sector. Any consumer who missed four bills in a row would be cut off.

Sudans talk up oil cooperation, but reality checks ambition

A mid-January agreement between Sudan and South Sudan to expand oil cooperation has raised expectations of improved relations yielding material benefits for both states from the south's under-utilised hydrocarbons reserves. But familiar obstacles are blocking progress, writes James Gavin

Both governments talked up the 14 January agreement signed by Sudan's undersecretary for the oil sector at the Ministry of Energy and Mining, Hamid Suleiman, and his South Sudanese counterpart, Awow Daniel Chuang, after talks in Juba. Yet the latest cross-border "deal" – following a similar declaration signed in late September 2020 – looks unlikely to remove the obstacles preventing South Sudan from boosting oil production and exports via its northern neighbour (*AE 425/1*).

The public pronouncements were upbeat: Chuang estimated South Sudanese production was averaging between 165,000 b/d and 170,000 b/d but said it would increase to 300,000 b/d within two to three years. He said the next step would be to move to a level where stable production could be realised. However, his forecast looks optimistic given the security and commercial considerations stymieing progress, despite evident improvements in relations at the government-to-government level.

The talks saw a commitment to establish a joint partnership on seismic data processing and interpretation, as well as drafting a protocol for cooperation in the field of oil training and capacity building, and commitments to open a coordination office in South Sudan to facilitate engagement, but analysts are sceptical that any substantial progress will follow.

Khartoum crisis

While the cooperation on oil is the only agreement that is being prioritised by Juba and Khartoum, James Okuk, a Juba-based analyst at the Center for Strategic and Policy Studies, told *African Energy* that such talks were not being followed up at the technical level of implementation because of a number of factors.

Sudan's government, facing a serious cash and fuel crisis, is eager for the South to ramp up supplies. In May 2020, it asked Juba to supply its El-Obeid refinery with an additional 20,000 b/d of crude, on top of the existing 30,000 b/d already taken by Sudan for the Khartoum refinery and Kosti power plant.

Sudan's deteriorating economy has seen inflation top more than 200% and protests against fuel and bread shortages have intensified in recent weeks, putting Prime Minister Abdalla Hamdok under increasing pressure to deliver on the promise of the 2019 revolution.

The oil sector is unlikely to help him. Sudanese production is struggling to hit 60,000 b/d, about 10% of the level it produced before South Sudan's secession.

South Sudan's production is estimated to have averaged 160,000 b/d-170,000 b/d in 2020, though the country's Opec+ commitments in Q4 2020 were set at 106,000 b/d. This is less

than one-third of the pre-2013 civil war production averages of 350,000 b/d. Consultancy Wood Mackenzie has projected that production could rise to 230,000 b/d were lasting peace to be sustained.

Wood Mackenzie analyst Toushar Chakrabarty told *African Energy* that the January agreement between Sudan and South Sudan could have a positive impact on production: "In the near term there's scope to bring some fields back on stream."

Only five fields in the Greater Nile Oil Project (GNOP) area are operating out of 13 in total, and these straddle the border areas, adding a layer of complication. At Block 5A in South Sudan, adjacent to the GNOP area, the developers led by Malaysia's Petronas are planning to add 15,000 b/d by 2022. The block is due on stream by mid-2021, with initial volumes of about 5,000 b/d.

North of the border, meanwhile, Sudan announced plans late last year for a 27-block licensing round. However, the Ministry of Petroleum and Gas website shows only 15 blocks available, and no details have emerged on timing. South Sudan, on the other hand, has been more vocal about its plans, with a delayed 14-block auction anticipated in March 2021.

"With the cooperation agreement with Sudan in place, and some guarantees about the export route, South Sudan could be better placed for long-term development," said Chakrabarty.

Security concerns

However, local observers are sceptical about short-term prospects, given the deterioration in border security. On the northern side of the divide in the Nuba Mountains that link to Sudan's main oil producing areas, the Sudan People's Liberation Movement-North (SPLM-North) commander Abdelaziz Al-Hilu remains active and has rejected Prime Minister Hamdok's entreaties to join a regional peace agreement signed in November last year.

On the southern side of the border, the Agwelek forces commander of the SPLM/Army in Opposition, General Johnson Olony, presents a challenge to the Juba government which has so far rejected his bid to be appointed governor for oil-producing Upper Nile State. "This creates security concerns in the area adjacent to oil-producing regions, causing the involved companies to be increasingly cautious," said Okuk. "They fear getting deeper into producing more oil when there's the possibility of fighting erupting at any time. They prefer to keep a low profile."

Another challenge is the slow pace of implementation of the revitalised peace agreement, which would have seen a unified force taking charge of security in all parts of South Sudan. "The parties are unable to move faster, and that slows down the prospect for increasing oil production between the two countries," said Okuk.

In Sudan, firefighting domestic crises has prevented Khartoum from finding a viable solution to cooperating with South Sudan. Worsening regional security in Darfur province and ethnic troubles aggravated by regional destabilisation resulting from Ethiopia's conflict with Eritrea have compounded Hamdok's dire economic problems, thwarting efforts to focus resources on building deeper relations with the oil-producing south.

There is little incentive for Khartoum to reconsider the punitive transit fees it charges South Sudan for its oil exports under the Transitional Financial Arrangement agreed between the two states after South Sudan's independence. Juba pays a tariff of $24.1/bbl for Dar Blend and $26/bbl for Nile Blend. This means Juba loses out financially if it pumps more oil north through the pipeline for export.

"Why hurry to pump oil out when it is more financially advantageous to keep it under the ground, especially when prices of the crude are lower and Khartoum gets $24 a barrel?" said Okuk.

Proposals to send oil to other neighbours, including Ethiopia – which solicited interest in South Sudanese crude imports back in 2019 – now look even more unlikely and the two Sudans remain locked in an unhappy embrace, with security worries likely to continue to undermine corporate appetite for a revival of the south's once-substantial productive capacity.

COTE D'IVOIRE

Tullow exits most onshore blocks

Cairn Energy has taken over operatorship of onshore blocks CI-301 and CI-302 following the withdrawal of Tullow Oil. The Cairn-Tullow joint venture has pulled out of blocks CI-518, CI-519, CI-521 and CI-522 with effect from end-December 2020, while Tullow remains as operator of CI-520, in the area east of Abidjan around Grand-Bassam, with Cairn as a partner.

Cairn said the 2021 work programme for blocks CI-301 and CI-302 was focused on completing a planned 2D seismic acquisition programme, once it is safe to do so. The partners began acquiring 2D seismic over the acreage in February 2020, but the programme was suspended in April due to the coronavirus pandemic. Tullow said in September that the data collected in the early stages of the project were being evaluated to decide on the next steps for the basin.

Tullow had taken a large position onshore Côte d'Ivoire since 2017, saying it had identified a basin-edge play similar to its Kenya acreage, but the company has altered its strategy over the past year as it struggles with high levels of debt. The company said in November it was moving away from its traditional focus on high-risk, high-return frontier exploration to focus on generating cash from its core producing assets in West Africa (*AE 428/14*).

Tullow retains the operatorship of offshore block CI-524, immediately west of its Ghanaian producing assets, as well as a non-operated stake in CI-26 and the producing Espoir field.

In a 27 January trading statement, Tullow said it had reduced net debt at end-2020 to around $2.4bn, from $2.8bn a year earlier, helped by the proceeds of its Uganda asset sale.

NIGERIA

Elumelu takes OML 17 stake

Nigerian businessman Tony Elumelu's Heirs Holdings has announced the acquisition of a 45% stake in onshore OML 17 from Shell, Total and Eni. The licence, which includes the Agbada field, has current production capacity of 27,000 boe/d and estimated 2P reserves of 1.2bn boe, with an additional 1bn boe of further exploration potential.

The transaction, valued at $1.1bn, was carried out via TNOG Oil and Gas Limited, a subsidiary of Heirs Holdings and Elumelu's Transnational Corporation of Nigeria (Transcorp) as part of Elumelu's strategy of creating an integrated energy business.

"We have a very clear vision: creating Africa's first integrated energy multinational, a global quality business, uniquely focused on Africa and Africa's energy needs. The acquisition of such a high-quality asset, with significant potential for further growth, is a strong statement of our confidence in Nigeria, the Nigerian oil and gas sector and a tribute to the extremely high-quality management team that we have assembled," Elumelu said in a statement.

Transcorp operates 2,000MW of installed power capacity through ownership of Transcorp Power Ltd in Ughelli, Delta State, and the recent $300m acquisition of Afam Power Plc and Afam Three Fast Power Limited, which closed in November 2020. Transcorp also supplies power to neighbouring Benin.

On the oil and gas front, Transcorp operates OPL 281, under a production-sharing contract with Nigerian National Petroleum Corporation, while Heirs Holdings' subsidiary Tenoil is the operator of OPL 2008 and also owns the Ata marginal field, which is due to start production in Q2 2021, with 3,500 b/d of oil.

OML 17 lies north of Port Harcourt, extending from low-lying swamp northwards into drier terrain where the operating conditions are easier. According to consultancy Wood Mackenzie, there are 15 oil and gas fields on OML 17, six of which are producing. Crude is exported through the Trans-Niger Pipeline to the Shell-operated Bonny oil and gas terminal.

Herbert Smith Freehills advised the senior lenders, including ABSA Bank, the African Export-Import Bank and Standard Chartered Bank, on the $450m senior financing element, involving the provision of a secured term loan and revolving credit facilities. The borrowers and sponsors were advised by Standard Chartered as global coordinator of the financing.

CAMEROON

New Age to seek Etinde extension

Société Nationale des Hydrocarbures (SNH) has given New Age (African Global Energy) Ltd formal approval to apply for a new exploitation agreement for the Etinde licence. This would replace the existing Etinde exploitation agreement (EEA) which came into force by presidential decree in January 2015 and had been due to expire.

Partner Bowleven said the new agreement, reached following talks with SNH, "would be for the production of hydrocarbons including the delivery of gas to thermal power plants or any other projects confirmed by the state".

Finding an outlet for Etinde's gas is key to developing the permit. The field's value is in the liquids, but the gas needs to be stripped out to enable the liquids to be monetised.

Bowleven had held the licence for many years before New Age took over as operator in 2015. In February 2020, Victoria Oil & Gas, which operates a gas distribution network in Douala, announced a letter of intent to take gas from Etinde. The project would see a 60km pipeline built from Limbe to Bekoko to carry the gas, with potential to add new offtake clients along the way (*AE 419/13*). A final investment decision on development of Etinde is expected this year, Bowleven said.

"We are pleased to announce that following a constructive dialogue between the Etinde JV partners and SNH, authorisation to apply for a replacement EEA has been granted. This is very positive news for the Etinde development, as it essentially eliminates the possibility of the government of Cameroon removing the Etinde licence from the JV partners, following the end of the initial six-year development implementation period in January 2021," said Bowleven chief executive Eli Chahin.

The previous EEA was awarded in 2014 over Block MLHP-7, granting title to the EEA area for a minimum of 20 years with an option to renew for up to a further ten years, provided the infrastructure to produce oil was completed by early 2021.

ANGOLA

Subsea 7 to build Sanha Lean Gas structure

Chevron subsidiary Cabinda Gulf Oil Company Limited has given Subsea 7 a contract for the Sanha Lean Gas Connection project in Block 0. The work comprises the construction and installation of a lean gas platform system at a water depth of approximately 70 metres.

The lean gas platform is planned as a fixed-leg structure bridge-connected to the existing Sanha condensate complex. Gas from

the Sanha field, which started condensate production in 2005, will be supplied to the Angola LNG plant at Soyo. Project management and engineering will be carried out from Subsea 7's offices in Paris and Lisbon. Fabrication will take place at the Sonamet yard in Lobito from 2021 to 2022, while offshore operations will follow in 2022 and 2023.

NAMIBIA

BW Energy raises Kudu stake

Operator BW Energy has signed an agreement with National Petroleum Corporation of Namibia (Namcor), raising its stake in the Kudu licence to 95% from 56%. Having failed to attract a farm-in partner, the Norwegian company wrote down the full value of the project in Q1 2020, saying the move reflected lower pricing and a delay to the expected development timing. BW Energy said the new arrangement would enable gas sales agreements and increased the likelihood of securing financing for the upstream.

Namcor will retain the remaining 5% working interest and has the opportunity to acquire an additional 5% working interest post first gas. Project company BW Kudu will pay $4m at completion of the transaction and carry Namcor's share of development costs until first gas.

"The next step for the Kudu joint venture will be to secure long-term commercial gas sales agreements, update the development plan to meet offtake needs and ensure robust financial project returns," said BW Energy chief executive Carl Arnet.

Kudu was discovered in 1974 but numerous operators have come and gone since then without developing the field, in part because the field's 1.3tcf size makes it too big for a Namibian domestic development but not large enough for a major international project (*AE 361/14*).

Namcor managing director Immanuel Mulunga said the Kudu project may become Namibia's first oil and gas development. "It represents an opportunity to reduce carbon emissions and strengthen energy independence for Namibia, which currently imports a major part of its electricity from coal-fired power plants outside of the country. I am confident this development will inspire increased exploration initiatives in other licence areas in the country."Total is due to drill the high-impact Venus well in ultra-deep water in the Orange Basin in Q2, using the Maersk Voyager drillship.

EGYPT

Shell takes Red Sea block

Following several block awards announced in early January (*AE 430/12*), minister of petroleum and mineral resources Tarek El-Molla has signed a concession agreement with Royal Dutch Shell, Mubadala Petroleum and Tharwa Petroleum for Red Sea Block 4. The 3,084km^2 block in the northern Red Sea owned by the South Valley Egyptian Petroleum Holding Company (Ganope) was offered in a licensing round in 2019. Shell will operate the block with a 63% interest, while Mubadala will hold 27% and local player Tharwa 10%. "The concession has the potential to unlock substantial new prospects," Mubadala said. The work programme for the initial three-year term of the licence included subsurface studies and 3D seismic acquisition.

Shell, which operates the West Delta Deep Marine project, announced in October 2019 that it planned to sell its Western Desert assets to focus on offshore gas growth. Abu Dhabi-based Mubadala is already present in Egypt in partnership with Eni, with stakes in the Shorouk concession, containing the giant Zohr gas field, and the Nour exploration concession.

Energean to develop shallow-water gas

London-listed Energean announced on 21 January that it had taken a final investment decision on the North El Amriya and North Idku (NEA/NI) concession subsea tieback project offshore Egypt.

The NEA concession contains two discovered and appraised gas fields, Yazzi and Python, while the NI concession contains four discovered gas fields, one of which is ready for development. NEA/NI is due to deliver first gas in H2 2022 from 49m boe of 2P reserves, 87% of which is gas. Peak production is expected to be approximately 90mcf/d, plus 1,000 b/d of condensates. The fields will be developed as satellite fields to Energean's existing Abu Qir gas condensate offshore and onshore infrastructure.

"The NEA/NI project is a key one for the Egyptian portfolio which will provide substantial benefits to the long-term production profile in the country, whilst bringing additional cost efficiencies and strategic benefits. When Brent prices are above $40/bbl, gas will be sold at $4.60/mBtu, which is the highest achieved to date for shallow water gas production offshore Egypt," Energean said.

The capital cost of the project is projected at $235m. TechnipFMC has been awarded the engineering, procurement, installation and commissioning contract. The NEA/NI drilling campaign is expected to be integrated with Energean's broader Abu Qir drilling campaign, providing synergies on capital expenditure.

Energean describes Abu Qir as one of the largest gas producing hubs in Egypt. It comprises three fields – Abu Qir, North Abu Qir and West Abu Qir – and a network of six production platforms interconnected by pipelines.

"2020 was clearly a challenging year but nevertheless a successful one for Energean. We completed the first phase of our transition to become the leading independent gas producer in the Mediterranean with the completion of the acquisition of

Edison E&P. The second phase of that transformation will be completed once Karish, our multi-tcf flagship gas project offshore Israel, commences production, enabling us to deliver material free cash flows and meaningful, sustainable shareholder returns," said chief executive Mathios Rigas.

Energean produced 35,400 boe/d in Egypt in the 12 months to 31 December 2020, approximately 86% of which was gas.

Production in 2021 is expected to be 26,000-30,000 boe/d lower than 2020 due to deferral of investments until after completion of the Edison acquisition.

MOZAMBIQUE

Vale plans Moatize sale

Brazilian miner Vale has announced plans to restructure the ownership of the loss-making Moatize coal mine as a first step towards exiting the coal business. Vale said on 20 January it had signed a heads of agreement with Japanese trading house Mitsui, allowing both parties to structure Mitsui's exit from the Moatize coal mine and the Nacala Logistics Corridor (NLC) port and rail project. Vale will acquire Mitsui's stake in the mine and logistics assets for $1 each, then seek a buyer for the assets, which could interest Indian or Chinese investors.

NLC links the Moatize mine in Mozambique's north-west Tete province via a 900km rail line through Malawi to the deep-water port of Nacala.

Vale said the transaction was in line with its focus on its core businesses and environmental, social and corporate governance agenda, committed to becoming carbon-neutral by 2050 and reducing 33% of its scope 1 and 2 direct and indirect carbon emissions by 2030.

The mine produces both thermal coal, burned to generate power, and higher-quality metallurgical coal, used to make steel. Vale said it had drawn up a new mining plan and a new operational strategy for the coal processing plants and was committed to preserving the operational continuity of the Moatize mine and the NLC, through the search for a third party interested in the assets. *Reuters* reported that Vale had hired Standard Chartered and Barclays to help with the sale process.

"The new mining plan prioritises ore bodies of better quality and has a better stripping ratio, which is expected to result in a better product mix and cost reduction, as an outcome of investments made in the last three years in an intense drilling campaign, aiming at better knowledge of resources and reserves," Vale said. The company is targeting a production rate of 15m t/yr in H2 20 21 and 18m t/yr in 2022.

Analyst Joseph Hanlon said the loss of mining income would deal a heavy blow to the Frelimo government, especially coupled with the prospect of a scaling-back of LNG ambitions (*AE 430/13*). "Frelimo has developed an elite and a patronage network based on growing resource rents and the vision of a gas bonanza in coming years. But the bubble has burst. Reversing the climate emergency is putting a rapid end to coal, and is capping the promised growth of natural gas. Vale is abandoning Tete and no new mines will open. There will be no railway to Quelimane. Even if Total continues with its current natural gas project, ExxonMobil and others are unlikely to start their parts, because of war and low gas prices. Global heating is causing an energy shift faster than most people – including Frelimo – expected," Hanlon said.

DEMOCRATIC REPUBLIC OF CONGO

Junior miner promotes sustainable lithium project

Australian junior miner AVZ Minerals on 21 January said its $500m-plus green lithium mine project at Manono would be fully supplied by the *Piana Mwanga hydroelectric plant* – once it has been refurbished – and would aim to achieve a number of other sustainability goals. Analysts said AVZ's investor call, which focused on sustainability issues following a greenhouse gas assessment at the Manono lithium and tin project by Environmental Resource Management, produced an uptick in its share price as it focused on the project "as potentially having one of the lowest carbon footprints of any lithium mine across the globe".

Manono holds world-scale lithium reserves. A feasibility study in 2020 estimated output at around 700,000 t/yr of high-grade lithium and 45,475 t/yr of primary lithium sulphate over a 20-year mine life. This calculated that the project required $545.5m capital investment, including a $49.6m contingency. Ore would be transported by road to Zambia and then via the Tazara railway to Dar es Salaam.

ASX-listed AVZ said it planned to purchase an electric mining fleet once commercially viable equipment is available, generate hydrogen from excess renewable electricity to enable use of fuel cell electric vehicles, and establish a 5,000ha sequestration plantation.

"Ultimately, we want to see the electricity generated from the Piana Mwanga hydroelectric power plant used to operate all our mining equipment, making the Manono project a 100% green mine," said managing director Nigel Ferguson. He added that "any surplus power may be provided into the national grid for use in the town of Manono", which is 85km from the project.

AVZ and the Ministry of Water Resources and Energy in January 2020 announced a memorandum of understanding to conduct

feasibility studies to refurbish the plant, on the Luvua River in northern Katanga (*AE 408/10*). With maximum 38MW capacity, it was commissioned in 1933 and mothballed in 1982 after the local tin mine (now flooded) closed. According to AVZ, the new Piana Mwanga plant could eventually provide up to 54MW, with an 18MW first phase generating electricity from two turbines (there is capacity for six turbines). A previous effort to rehabilitate the dam involved Spain's AEE Power (*AE 295/6*).

In December, AVZ Minerals struck its first lithium offtake agreement with Gangfeng Lithium subsidiary GFL International, for the sale to the Chinese firm of up to 160,000 t/yr of spodumene concentrate over an initial five-year period (with an option to extend for five years). Ferguson said AVZ was working to secure more offtake deals.

Manono is in Tanganyika province, which was created from part of Katanga province and is at the centre of the former ruling Kabila family's support base. Former president Joseph Kabila's brother, Zoé Kabila, has been provincial governor since 2019; unlike his brother's Front Commun pour le Congo, Zoé Kabila has been involved in national reconciliation talks with President Félix Tshisekedi. The United Nations has a base in Manono town.

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16 February
South Africa: The latest gas and electricity supply industry trends

16 March
Off-grid: Expansion and integration of SHS and mini-grids

20 April
West Africa: Looking at latest developments in francophone countries

15 June
Technology: How might the grid evolve over the next 25 years?

13 July
Nigeria: Focusing on policy issues and the energy value chain

21 September
Grid & Storage: Africa's power network in an age of transition

19 October
East Africa: Overview of the region's diverse and dynamic energy sector

14 December
North Africa: Developments in the gas and power market

Other events

8-9 March: Mozambique Gas & Power, Maputo

Organised by Africa Oil & Power.
Web: *www.africaoilandpower.com/event/mozambique-gas-power-2021*

15-18 March: North Africa Petroleum Exhibition & Conference, Oran

Web: *www.napec-dz.com*

11-13 May: Enlit Africa

Web: *www.enlit.world/africa*

15-16 June: Angola Oil & Gas, Luanda

Web: *www.africaoilandpower.com/event/angola-oil-gas-2021*

21-22 June: Africa Assembly, Paris

Organised by the Energy Council.
Web: *https://energycouncil.com/event-events/africa-assembly*

29-30 June: South Sudan Oil & Power, Juba

Web: *www.africaoilandpower.com/event/ssop-2021*

24-25 August: Power & Electricity World Africa, Johannesburg

Web: *www.terrapinn.com/exhibition/power-electricity-world-africa/index.stm*

21-22 September: DRC Energy & Infrastructure Investment Summit, Kinshasa

Web: *www.africaoilandpower.com/event*

1-5 November: Africa Oil Week, Cape Town

Organised by Hyve. Web: *https://africa-oilweek.com/Home*

29-30 November: World Energy Capital Assembly, London

https://energycouncil.com/event-events/world-energy-capital-assembly

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Much potential but far to go for nascent hydrogen economy

The most abundant element on earth, hydrogen, already has industrial uses, but it could do much more to transform the global energy mix as industrialised economies and the global south decarbonise. Judged by the welter of governmental and corporate statements, hydrogen is featuring large in the thoughts of planners and project promoters. These range from Chinese hydrocarbons giant Sinopec's plans to reallocate some of its Rmb87bn ($13bn) cash pile to projects "all along the hydrogen chain" to Australian junior miner AVZ Minerals' green lithium mine project at Manono in Democratic Republic of Congo (see *Finance and policy*).

Most of the currently available industrial hydrogen is produced from natural gas through a steam methane reforming process. Without any carbon capture element this hydrogen is labelled 'brown' or 'grey', but when the resultant CO_2 is captured and then utilised or stored, it becomes 'blue hydrogen'. Most excitement surrounds 'green hydrogen', which is produced when renewable power is applied to water, breaking H_2O into its hydrogen and oxygen components. This could be used to generate electricity, store energy (stabilising grids), fuel transport and drive industrial and other applications.

For all the excitement, hydrogen's worldwide application is still largely limited to pilot projects and big ambitions. Sinopec built China's first hydrogen filling station only last year; it plans to roll out 1,000 filling facilities across China over the next decade, to support 1m vehicles. Critical is the element's potential to be scaled up. Existing transport applications may be most appropriate for isolated mines and urban bus fleets, while the fuel's wider use requires huge investment in infrastructure.

The figures are daunting, for all the talk of a future 'hydrogen economy' replacing carbon across the globe, as expressed in enthusiastic reports like PwC's *Unlocking South Africa's Hydrogen Potential*. BloombergNEF estimates that generating enough green hydrogen to meet one-quarter of global energy needs – the sort of ambition regularly stated – would take more electricity than is generated now from all energy sources, with an $11trn estimated investment in production and storage.

Diverse governments are seeking global leadership to meet this challenge. Australia's ambition to become a major export hub is helped by big investments in using hydrogen by its key markets Japan and South Korea. *African Energy*'s sister publication *Gulf States Newsletter* has highlighted big-spending efforts by the UAE and Saudi Arabia. Countries that lack large-scale hydrocarbon resources like Morocco and Tunisia are talking up their green hydrogen and fuel cell technology potential (*AE 430/1*). Egypt recently signed an agreement with Siemens to launch a green hydrogen project using its abundant new renewables capacity.

It is perhaps time to dream big as the world is rethought following the coronavirus pandemic. Africa has shown it can lead in making technological transitions and the continent's gas and renewables resources suggest it is well placed to exploit the opportunity. PwC observed that although "exceptionally energy dense per unit of weight… [energy-efficient hydrogen] is no more difficult to store and transport than liquified natural gas". When cheap clean energy and water are available, "hydrogen can decarbonise a greater range of sectors than renewable electrical energy alone".

This represents an opportunity for South Africa, where Sasol has long produced hydrogen-rich syngas from another cheap, abundant resource: coal. The first green hydrogen fuel cell electric mining trucks are being tested at Anglo American's Mogalakwena mine. Rare metals needed to build the emerging hydrogen economy, such as platinum used in fuel cells, are most abundant in Africa. Recognition of this has boosted the share prices of Implats and other producers.

Hydrogen will play a role in specific situations, and may eventually replace gas and other fossil fuels. But planners may find it requires too much investment to be a major solution any time soon, if a Bank of America research paper was correct when it commented: "Hydrogen can offer additional abatement [from fossil fuels], but it's not an early 2020s story."