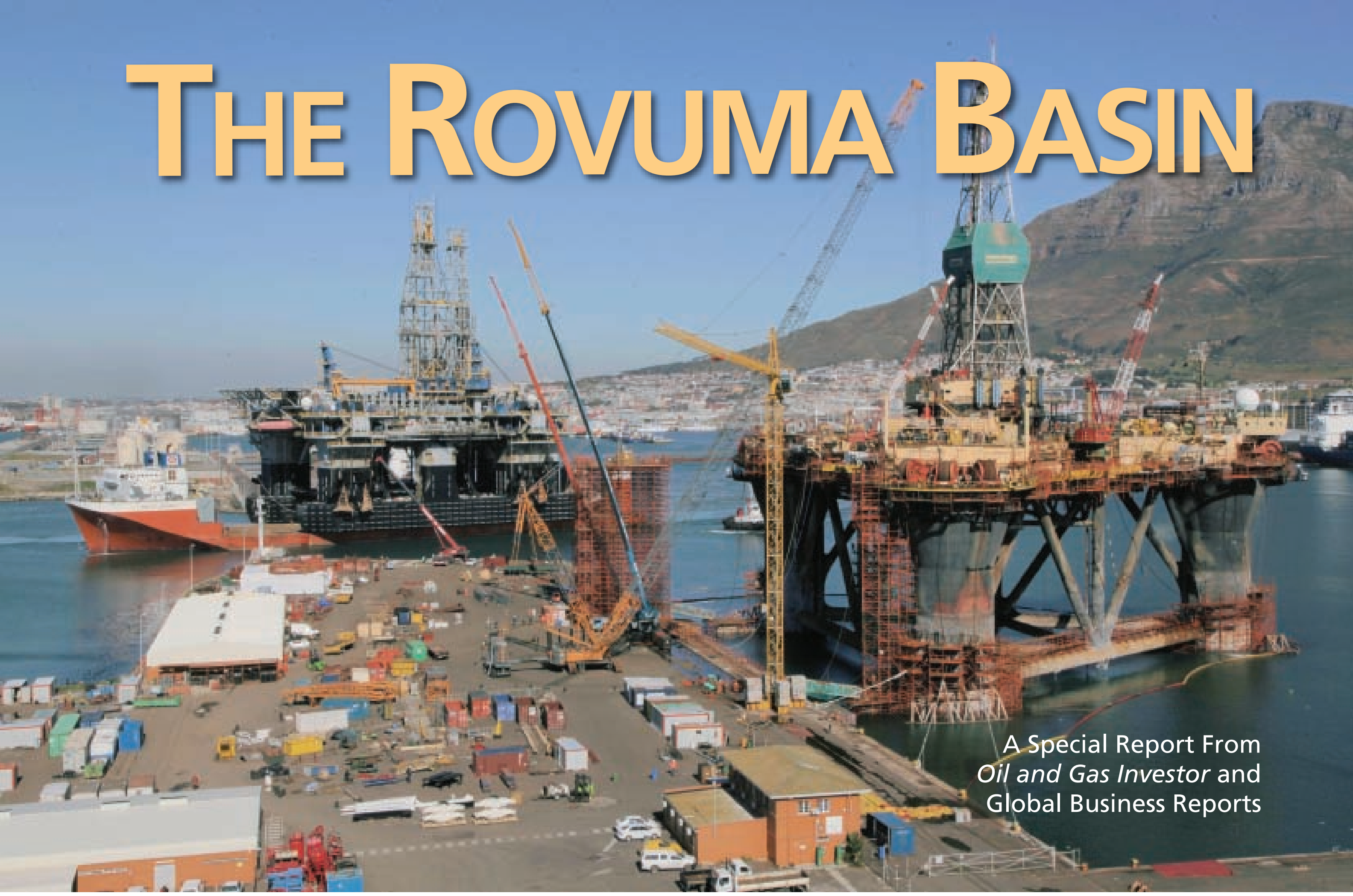
THE ROVUMA BASIN



Semi-submersible rig *Noble Clyde Boudreaux* leaving the Port of Cape Town on heavy lift vessel *Mighty Servant 1*. Photo courtesy DCD Marine

INTRODUCTION

Transforming East Africa Into A Global Energy Player

There is huge potential, but challenges lie ahead.

East Africa is not the first region in the world that comes to mind when one thinks of energy production. Nevertheless, with discoveries of significant proportions taking place along the continent's eastern coast, it appears that the region may be clawing back some investor appeal from the global hydrocarbon community.

Exemplifying the exciting new developments taking place in East Africa is the Rovuma Basin, a resource-rich geological region located along the border of Tanzania and Mozambique that could potentially hold up to 150 trillion cubic feet (Tcf) of gas.

Between the two major companies involved in discoveries on the Mozamibican side of the basin, Anadarko and ENI, there are currently 77 Tcf to 112 Tcf of declared reserves. "To put things into perspective, this is far bigger than the North Sea. Anadarko's discovery alone could likely hold up to 100 Tcf. Taking into consideration that this company is a publicly listed American company, the reserves are likely to be around 150 Tcf, a world-class reserve by any standard. Most specialists are predicting that Mozambique will likely be ranked second or third in the world in terms of liquefied natural gas (LNG) prospects," explained Paul Eardley-Taylor of Standard Bank, oil and gas coverage, Southern Africa.

Although discoveries made on Tanzania's side have been more modest, the 40 Tcf of proven gas reserves will undoubtedly have a transformative effect on the nation's economy as well. With Statoil paving the way for smaller junior players, many more discoveries are expected in the near future.

Given the location of these recent discoveries and global energy demand, it is highly likely that LNG production will be the path that both nations pursue. Speaking of the region's potential, Eardley-Taylor expects the region to follow in the footsteps of its Middle Eastern predecessors. "The two-train LNG will be the kick-start of the whole shooting match. As was the case with Qatar and Oman, the initial capital investments in order to develop these projects will be high. Trains 1 and 2 will be costly and will provide modest returns. Nevertheless, as trains 3 and 4 are built, the capital costs drop significantly, resulting in higher returns. There is no reason why this model should not work for Mozambique and Tanzania in the years to come."

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Armando Emilio Guebuza, president of Mozambique, attends Aggreko's Ressano Garcia site inauguration.

Bill Page, director, Deloitte Tanzania

Paul Eardley-Taylor, head of oil and gas coverage, Standard Bank, Southern Africa

Nevertheless, while excitement is undoubtedly in the air, there are a number of obstacles standing in the way of the respective governments' development plans, namely the lack of infrastructure and technical know-how. In order to ensure that East Africa's transition into an energy hub is successful, it is imperative that host governments engineer regulatory frameworks that encourage investment from abroad while at the same time guaranteeing that their citizens play a meaningful role in the growth of the nascent industries.

In the case of Mozambique, it has been predicted that the development of its first LNG train will cost approximately $20 billion; a value greater than the entire country's 2011 GDP of $15 billion. It is expected that $12 billion will be raised in the form of debt, while the remaining $8 billion will be equity. "Raising the debt, particularly when taking into consideration the difficult period global financial markets are going through, will be much more challenging than raising equity. Further complicating issues is the fact that Mozambique has double-B-minus investment grade," said Eardley-Taylor.

Another daunting task that will face the government of both Tanzania and Mozambique will be ensuring that their citizens take part in the development of the basin. Given the limited experience of these nations in the sector, human capital in both countries is undeveloped. Overcoming this challenge will be integral to the success of the industry.

In spite of the challenges that lie ahead, optimism and excitement are abuzz in East Africa. Indicative of the positive energy, Bill Page, director at Deloitte Tanzania, said, "This will be the opportunity of a lifetime, particularly for the citizens of these countries. It is the biggest thing that has happened in East Africa since decolonization, and it will not come again. It has the potential to create the middle-income countries that they aspire to be, and lift entire populations out of poverty." ▪

Interview With John Peffer, President, Anadarko Mozambique

What were the factors behind Anadarko's decision to enter Mozambique?

Peffer Anadarko is a global leader in the deepwater sector worldwide, especially in the Gulf of Mexico. Some of our geoscientists in Houston had been to Mozambique in the early 1980s, when deepwater operations were not even on the agenda. The deepwater opportunities in Mozambique arose in 2005 with the opening of the Rovuma blocks, and we took advantage of our in-house knowledge to pursue Rovuma acreage. We made a seven-well commitment, as well as 3-D and 2-D seismic surveys, the largest international exploration commitment in Anadarko's history. In summary, I would say the important factor for entering Mozambique was the fact that we had geoscientists who had identified the potential opportunities in Mozambique, and once the deepwater blocks opened, we were quick to gain market entrance.

Is there anything specific in the geology here that makes natural gas exploration attractive?

Peffer When we came to Mozambique we were primarily looking for oil. Historically, East Africa is a natural-gas-rich territory, and that is the reason why it had not been explored more extensively until a few years ago. Although we have always known that the onshore would be natural gas prone, there was and continues to be potential for oil in the deep water. To date, the results of our exploration have been spectacular, and our natural gas discoveries have significantly exceeded our initial expectations. Currently standing at approximately 30 to 60-plus trillion cubic feet (Tcf), this is undoubtedly a discovery of tremendous size that could have a transformative effect on Mozambique's economy.

Anadarko's investments in Mozambique are an important driver for the economy. How do you make sure that the benefits coming from your investments are felt by the local population?

Peffer Since we started our exploration program we have invested more than $1 billion, including several million dollars per year for social, training and institutional development, creating jobs and other economic benefits for the people of Mozambique. Once production begins, we expect the project to provide significant cash flow for the partnership and tax revenue for the government that can be used for the development of the country. We believe that Mozambique has the potential to become the third-largest LNG exporter in the world and reaching this potential means more training, more jobs and more industry-specific experience for the local people.

Does the fact that you are working offshore diminish the benefits available to the Mozambican people?

Because we are developing these resources via LNG, we expect Mozambique will experience significant benefits that come with any onshore project: employment possibilities, investments in new airports, roads, ports, and communication infrastructure. ▪

Legal Framework

New legislation is set to shape the future of the sector.

Owing to the embryonic state of both Tanzania and Mozambique's energy sectors, the laws and regulations governing the oil and gas sector remain unclear.

Nonetheless, despite the apparent lack of clarity, members of the legal community in both nations are optimistic that the regulatory frameworks being developed will be conducive to the growth and the development of the respective oil and gas sectors.

The Mozambican government is aiming to complete its general petroleum law by year's end. In addition to the World Bank, the Norwegian and United States governments are advising INP, Mozambique's national hydrocarbon's regulator, in the effort to write the bill.

According to Pedro Couto, of CGA, "the government's approach has been to get proper consultants and hear what people have to say; it is producing good pieces of legislation that are very well received by the private sector.

"The new petroleum law will not contain surprises, and I am sure most companies will be happy with it. The government is making a real effort to create a trusted legal system and please international investors, whose fears about African political risk disappear once they have been in the country for six or eight months."

The case of Tanzania remains very similar to that of Mozambique. The government's Gas Act, which will encompass all stages of natural gas development, is expected to be introduced as law by November 2012. "The Gas Act is a draft for a bill that is still sitting with the parliamentary draftsmen, so it has not even reached parliament.

EALC cannot put too much weight in this draft just yet because it will go through many changes between now and when or if it is passed.

"The government has been under pressure to expedite the process as much as possible due to the amount of investors waiting on the outcome," said Stella Ndikimi, partner at East Africa Law Chambers, member of Bowman Gilfillan Africa Group.

The end result of this process will be of paramount importance to the futures of both Tanzania and Mozambique. Although law has yet to be finalized, parastatal companies like the Tanzanian Petroleum Development Corp. (TPDC) already have plans to modify its role in the industry over the next five years.

"As Tanzania proven gas reserves continue to increase with each subsequent discovery, and TPDC's revenues climb with production, there will be a need to cease TPDC's role as regulator in the industry," said Elias Kilembe, acting managing director for TPDC at the time of our visit.

"TPDC will have its focus strictly on oil and gas production and exploration; we will become the national hydrocarbons company, adopting the same model found throughout most gas-producing states. In conjunction, a separate government entity should be created to play the role of regulator for the industry." ▪

Shale-gas debate diverts attention from big oil-and-gas rush off South African coast

by Lizel Oberholzer, director, Bowman Gilfillan

The ongoing shale-gas debate around fracing in the Karoo is distracting attention from the "oil-and-gas" rush off the South African coast. There is a massive rush off the South African coast that has the potential to radically alter the energy landscape of South Africa, and no one is talking about it.

Within months of the discovery of huge gas reserves off the Mozambican coast in early 2012, international oil companies rushed in to explore oil and gas opportunities off the entire coast of South Africa: east, south and west. They include names such as Anadarko, Total, Sasol and ExxonMobil. Approximately 99% of all drillable areas off the coast have been awarded or are under application.

Silver Wave Energy Pte. Ltd., Singapore, was the first to make applications to the Petroleum Agency of South Africa for technical cooperation permits over most of the available area off the east coast. A technical cooperation permit is merely a desktop study of the available data over the area, and does not include any physical activity over the block.

Left, Lizel Oberholzer, director, Bowman Gilfillan South Africa. Right, Stella Ndikimi, partner, Bowman Gilfillan Tanzania

There is a concern that a large part of the explorable area could be granted to just one company, which could have serious implications around competition and fair access for previously disadvantaged persons.

This is because the Mineral and Petroleum Resources Development Act (MPRDA) does not limit the area over which oil companies may apply for petroleum rights and permits, and stipulates that these applications must be processed on a first-come-first-served basis.

With hindsight, it would have been preferable if the government had announced a bidding round for these offshore blocks, limited the number allocated to each bidder and looked at each applicant's financial and technical ability to drill for oil and gas.

Instead of being excited about these recent offshore oil-and-gas developments and the benefits they may bring, we are being sidetracked by the shale-gas issue.

Infrastructure

Overcoming infrastructure challenges will be vital to the success of the gas sector in both nations.

Excitement surrounding the recent discoveries in the Rovuma Basin is warranted. However, given that both Mozambique and Tanzania suffer from limited infrastructure that threatens to stunt the industry's growth, caution is also required. No sector is better positioned to enjoy the benefits of the gas boom while at the same time understanding the difficulties that come with limited infrastructure than logistics companies.

Looking to take advantage of the new opportunities in the gas industry, Bravo Logistics has been aggressive in capitalizing on its enviable position as a domestic logistics company. "Oil and gas is now a potential area. The good thing is that we now have something happening at home after all our work in other countries; we can see this positioning us well," said Ngalula.

Ngalula believes that Tanzania's gas sector is bound to hit roadblocks if the government does not step up its efforts to upgrade the country's infrastructure. "The Tanzanian government is encouraging infrastructure investment, but it is moving slower than we expected. After the gas discoveries, this year a very small budget was allocated for Mtwara port. Heavy equipment, which could go directly there, still has to be taken by road from Dar Es Salaam."

Another Tanzanian logistics company, which has recently made inroads into the industry through its work with the TPDC, is Sino Logistics. Like Bravo, the company has aspirations to grow rapidly but has been constrained by forces outside of its control. "Our oil and gas clients have been very pleased with the services we have provided for them. Nevertheless, we are at times unable to keep up with demand due to the limited infrastructure we find at our ports and roads," explained Innocent Swai, managing director of the company.

Slade Thomas, chief executive officer, Starlite Aviation Group

In spite of the challenges it faces, Sino Logistics has plans to increase business in the oil and gas industry by more than 50% in 2013. "Winning the TPDC contract was a monumental step for the development of our business. We hope to build upon this success, expanding our client base in the months to come," said Swai.

Although Tanzania is often assumed to be far ahead of its southern counterpart in terms of its infrastructural capabilities, recent efforts by the Mozambican government are closing the gap. "The Mozambican government has declared an infrastructure policy for 2012 to 2015, all based on Public-Private Partnerships (PPP), and it seems to be working already. Included are railways, toll roads, ports and airports. It will be the same for coal and LNG. The government is not expecting to be an operator in these projects, but it will not be a silent partner. It will want to take part. All processes are Build Operate Transfer (BOT) or Build Own Operate Transfer (BOOT): there will be a return at the end of the period," said Pedro Couto, partner, CGA.

In order to assist with the effort to explore the remote Rovuma Basin, South African helicopter transport company Starlite Aviation is providing its services to E&P clients throughout East and Southern Africa. "Our affordable, multi-task service fills a niche in the helicopter contracts market, which the larger players ignore or cannot fulfill. We see East Africa and the emerging markets of Southern Africa as the most important part of our growth strategy in the oil and gas industry. We have identified the five frontier countries—Kenya, Tanzania, Mozambique, South Africa and Namibia—as our focus for growth," said Slade Thomas, CEO. ▪

Fueling Exploration

International companies look to assist explorers.

Besides the logistical challenges that explorers in the region are set to face, a number of technical obstacles are expected to continue to hinder operational efficiency.

One such challenge pertains to measuring gas flow. Fortunately, global equipment manufacturers Krohne believe they have found a solution to this problem with their introduction of the Altosonic gas meter. Although gas meters are traditionally associated with downstream aspects of the business, the Altosonic gas meter provides solutions for upstream explorers. "Drilling is so expensive nowadays that even the big oil companies, such as Statoil and Shell, have started sharing costs on platforms. Since on the platform itself the product is transferred from one company to another, we are now also selling meters on the drilling platforms. Seeing the opportunity in the upstream market, we have started selling our meters to explorers in East Africa," said Jan Drenthen, director of Krohne.

The Altosonic meter utilizes state-of-the-art technology that is able to detect and take into account any disturbances when measuring gas flow. The product provides explorers with a wide array of benefits, the most important being that it could enable explorers to save millions.

"If you consider how much gas goes through the meter every year, just 0.1% of additional uncertainty can leave you millions of dollars in deficit. For instance, a 12-inch meter, operated at a pressure of 75 bar, could potentially save a company about $1.3 million (some 10 million Rand) per year. The price of the ultrasonic meter itself, between $30,000 and $40,000, is absolutely irrelevant compared to that; your payback time is within days or weeks," explained Drenthen.

In addition to equipment providers, power companies like Aggreko are also looking to join the fray. With recent experience working with mining giant Vale in Mozambique, the South African energy producer is aiming to offer its services to gas explorers. Speaking of its recent experience, Martin Foster, head of local business SEA-YP for Aggreko, said, "Our local centers are able to cater to both upstream and downstream users. In the Middle East, Aggreko supplies a lot of power to the exploration fields of companies like Schlumberger and Halliburton. We do this in remote locations that do not have reliable grid power, a scenario that is particularly applicable to certain parts of Africa. Downstream, we work a lot with refineries, typically when they want to keep parts of their plants running during shutdowns and planned maintenance." ▪

Krohne Altosonic V12 is an innovative solution for gas and steam measurements, with superior performance.

The South African Hub

Taking advantage of the East African gas boom.

Ideally nestled between western and eastern Africa, Cape Town's upstream oil and gas industry is hoping to take advantage of its enviable position. The South African Oil and Gas Alliance (SAOGA) was established for the purpose of facilitating and encouraging entry into these frontier markets The organization was originally established to support the service side of the industry, and is still largely funded by the provincial government. Today SAOGA has 150 members, drawn from all parts of the country.

Warwick Blyth, SAOGA's chairman, sees the opportunities on Africa's east coast as "truly massive. The amazing thing is that there is nothing there at the moment; Pemba Bay is a sweeping little African village with a very small port and no development. It takes about nine days by road for a container to reach Pemba from South Africa. There is no supply chain, and it is difficult for traditional U.S. and European centers to bring equipment through; even flying people in is a challenge because you still come through Johannesburg on the whole," Blyth says.

"There is therefore a huge opportunity for South African industry to step up and provide large parts of the supply chain; not necessarily the highly specialized stuff, but certainly much of the spare parts, repair and maintenance, medical support and construction work can and probably will come from South Africa." Nevertheless, while Blyth remains excited about the prospects, he understands that competition will be fierce, and that South African companies will by no means be guaranteed work in the future, “The oil and gas industry is used to working in far-off places; the competition in Mozambique will be the same as anywhere else in the world. There is the possibility that all work can be done on a completely remote basis, as it is in Angola and Kazakhstan, but the alternative of drawing on South African industrialization is more efficient.”

Garth Strachan, chief director for the Industrial Development Division at the Department of Trade and Industry agrees with Blyth. “South Africa boasts a rich history in pioneering and developing primary commodity related technologies, including capital equipment into the mining sector as well as very significant supply chains for a wide range of products and services in the upstream oil and gas industry. South Africa is therefore well placed to service the burgeoning oil and gas exploration and exploitation industry in sub-Saharan Africa.” ▪

Making the most of the discoveries.

Echoing the message of cautious excitement that has come with the discoveries in the region, Eardley-Taylor of Standard Bank said, “I hope that Mozambique and Tanzania continue to take full advantage of the resources that they are blessed with. We often hear of the resource-curse horror stories that have taken place around the globe; it would be great to see Mozambique avoid this path, following in the footsteps of the other success stories like Qatar, leveraging and monetizing their resources.”

Guaranteeing that these African states make the most out of their newly found resource will require prudence and foresight from both foreign multinationals and the respective governments. Fortunately, cooperation amongst the different parties is already beginning to bear fruit. Recent efforts by the TPDC and its partners in the private sector to train and educate Tanzanians in petroleum engineering are under way. “Universities, technical colleges and vocational schools have introduced curriculum with the goal of preparing students for meaningful careers in the oil industry upon graduation,” said Kilembe.

Of equal importance to the future of the sector will be internal reform. As the investment dollars continue to pour into East Africa, levels of corruption, high in both states, will have to drop significantly. Failing to tame this issue will undoubtedly lead to unjustifiable income disparities and disenchantment amongst the public for the industry as a whole.

Realizing the dream of transforming East Africa into a global energy hub will only become possible if the benefits of sector are experienced by the masses. If this fails to take place, then the countries that share the Rovuma Basin may find themselves along the same path as some of their richer, yet socially troubled, counterparts in West Africa. The hope is that all parties can learn from the past mistakes in the continent, and instead use this new-resource wealth to transform Tanzania and Mozambique into middle-income economies. ▪

Errata

In our Peru special, we said that Shell abandoned the Camisea project in 1988. The correct date is 1998. We also said ERM is a Spanish company, when it is a British firm. We regret the errors.