Woodside's Kenya deal raises hopes: is East Africa the next big thing?

New studies, and new exploration contracts, suggest there may be oil off the coast of East Africa after all. Can it be that East Africa really is the next big thing for oil companies, asks **Thalia Griffiths**.

So far East African exploration has attracted mainly smaller companies, but the Kenya farm-in by Australia's Woodside Energy suggests there may be more to the region than previously thought. And just as it has been in frontier areas of West Africa, the exploration is being led by risk-hungry Australian companies.

The *East African Petroleum Conference* held in Nairobi in March raised several companies' interest in the region. Aminex is spudding a well off Tanzania in August, and France's Maurel & Prom, Royal Dutch/Shell and Brazil's Petrobras are on the verge of signing for acreage off Tanzania after lengthy negotiations *(AE 56/7)*. Canada's Antrim Energy has completed phase one of its Tanzania programme, and Malaysia's Petronas is exploring the Zambezi Delta in Mozambique.

Woodside has taken a 40% operating stake in Dana's four blocks in the Lamu basin, saying it hopes to reproduce its success offshore Mauritania. Woodside will operate blocks L5, L7, L10 and L11, which cover 47,500km^2 in water depths of up to 3,000 metres. This acreage includes some onshore areas and coastal waters.

Woodside's commitment under the farm-in is limited to the acquisition of 5,000km of 2D seismic in 2003-04 at a cost of $3m. After two years, the joint venture has the option of entering a second exploration phase, which would include drilling of one exploration well in each of the blocks renewed.

Dana's interest in the blocks will be 40% with the remaining 20% continuing to be held by Star Petroleum International (Kenya), a wholly-owned subsidiary of Brisbane-based Global Petroleum, which listed on the Australian Stock Exchange in November.

Woodside public issues manager Rob Millhouse told *African Energy* the deal's attraction was that it provided a low-cost entry point for Woodside to develop its knowledge of the region's geology, with an easy exit if necessary before the company had to commit to any drilling programme.

The contract for seismic work is being finalised. Millhouse expected the survey to be done by end-year. "If we find it does not support viable drilling prospects, we can walk away," he said.

Shell's enduring interest

Shell, which owns 34% of Woodside, has been interested in the region for some time. Director of new ventures Agu Kantsler said a study of East Africa by Woodside had identified a variety of geological features with a range of leads of 50m to 1bn barrels.

"Our review identified East Africa as an under-explored frontier province that has the potential to replicate Woodside's successful exploration strategy in Mauritania," Kantsler said in a statement. "Kenya's oil and gas exploration industry has been virtually inactive since the early 1980s and this opportunity provides Woodside with a relatively low-cost entry to a very large area which we can mature by using our strong technical skills and leveraging from our success in deep water off Mauritania."

Between the 1950s and 1971, Shell and BP drilled 11 wells off Kenya, without finding hydrocarbons. In the 1970s and 80s, companies including Chevron, Total, Amoco, Petro-Canada and Texas Pacific drilled another 17 wells. Shell drilled another two wells off Mombasa in the early 1990s that had oil shows. Star Petroleum brought in Dana as a farm-in partner in 2001, and in 2002, British Virgin Islands-registered Afrex signed for blocks L6, L8 and L9, alongside Australia's Pancontinental Oil & Gas *(AE 55/16)*.

During the negotiations for the acreage, Afrex was acquired by Black Rock Oil & Gas, another Australian junior.

"It's a frontier region, relatively unexplored, and we see some analogies with West African geology," said Millhouse.

The region presently imports almost all of its fuel needs. Kenya has proposed building an oil pipeline from Sudan, although the high cost of such a venture makes it unlikely in the short term. An increase in regional exploration activity could benefit firms such as Otterbea International, the logistics business acquired by DiamondWorks last year.

Improved energy supply could provide a valuable boost to the Kenyan economy, and to the government of President Mwai Kibaki, which faces the Herculean task of bringing about a recovery after decades of corruption and stagnation. Millhouse said the early signs of reform were encouraging.

Report highlights hopes for region

UK consultants Jebco Seismic and Global Exploration Services (GES) have completed a report on the East African margin, and are negotiating contracts for multi-client seismic with governments in the region.

"It really is the year of East Africa," Jebco's Chris Matchette-Downes told *African Energy*.

East African exploration success so far has been limited to gas, which is being harnessed for power in projects such as Tanzania's Songo Songo, and Sasol's project in Mozambique to pipe gas from the Pande and Temane fields. "Company after company has gone in over the past two or three decades and dismissed it as gas prone at best, but now we're seeing there's plenty of evidence of oil potential," said Matchette-Downes.

The authors re-examined the logs from a well drilled by Phillips in May 2000 in the Durban basin and found a lot of evidence of hydrocarbons that had not been reported, perhaps because the quantities were not commercial and the partners did not want the expense of a second well.

"There's not enough to claim a commercial discovery, but it does provide evidence of a major source-rock structure," Matchette-Downes said.

Until now, East Africa has been seen as a region with limited hydrocarbons prospectivity. The region lacks exposed, quality source rocks and dry holes drilled in the past have been assumed to prove the lack of a source. Yet its supporters note that there are as many oil and gas seeps in East Africa as in West Africa, and new ones are still being found.

Western Madagascar hosts one of the world's largest heavy oil accumulations – larger than many of the West African basin-margin asphalts.

The Jebco-GES report reviews previous studies by Western Geco of deep-water Tanzania in 2000 and by Exploration Consultants of Mozambique's Pande and Temane gas fields in 2001, as well as considering why Madagascar has so far failed to fulfil its apparent potential.

It uses satellite-derived gravity maps to divide the East Africa offshore, from southern Somalia to northern South Africa, together with western Madagascar, into segments for which the prospectivity is assessed and regionally ranked.

Drift section potential

According to the report, whose main author is GES's Nick Cameron, the most favourable areas for reservoir development are those where the drift section is thickest and contains the best quality sand developments. These are associated with either main river mouths or with clusters of smaller rivers, and are positioned along the hanging wall of the continental hinges in deep-water settings. Sand delivery and the overall sediment supply volume increased in the younger Tertiary, but there are also multiple Cretaceous depocentres, many with reservoir quality sands.

The report predicts oil-prone source rocks in the deep-water Somali and Mozambique basins from the mid-Jurassic rift-drift transition upwards into the drift section and possibly in beds as young as Turonian. The source sequence is predicted to be of regional extent in the Somali Basin, and may also be more widespread in the Mozambique Basin.

GES says excellent quality and richness characterise the rift-drift transition source sequences of Tanzania and Madagascar, and predicts an end-Jurassic to probably Turonian source section for the Durban Basin, where oil-prone sources are expected in present-day deep-water settings.

The report says that basin modelling shows the oil window is preserved where the section is over-pressured beneath a thicker section and extends further out into the deep water than indicated by conventional time-temperature models. In addition to the deep-water sand opportunities, footwall traps positioned along the hinge line present attractive targets for charges released following the failure of over-pressured cells. Ongoing tectonism related to the growth of the East Africa Rift and the reactivation of the Davie Fracture Zone has created multiple opportunities for this method of hydrocarbons delivery.

Mozambique activity

Ambitious independent Vanco Energy Company has carried out two 2D seismic surveys on Madagascar's Majunga Offshore Profond block.

Mozambique has yielded only gas so far, but Malaysia's Petronas has an E&P contract for the offshore Zambezi Delta block.

Tanzania potential

Tanzania has seen slightly more activity than the rest of the region in recent years. As well as the Songo Songo gas field development, exploration is starting to pick up, with Shell finalising a production-sharing contract with Tanzania Petroleum Development Corporation for Blocks 9-12.

Canada's Antrim Energy lifted *force majeure* on its Pemba Zanzibar concession in April 2002 and plans seismic and one well in a new four-year contract period likely to focus on exploration of the North Pemba prospect.

London-based Aminex, which took over Australian firm Tanzoil's Tanzanian interests in 2002, has secured an F200 rig from Romania's Dafora Group for a drilling programme on the Nyuni offshore licence, comprising two wells with an option for two more.

Nyuni-1 is due to spud in early August and drilling of a second well on a separate structure is expected to continue into early 2004. Estimated cost of the initial two wells is $10m. Romania's Petrom farmed into the licence, which lies adjacent to the Songo Songo gas field, in December 2002, taking 30%.

Aminex said Nyuni-1 would be the first offshore well to be drilled in Tanzania for 12 years. "We believe that enormous oil and gas potential exists along the East African margin, which has only been very lightly drilled to date, and that it presents great opportunities," said chief executive Brian Hall.