

Petroleum resources in East Africa

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The East African Region has a total of 28 prospective sedimentary basins with over 37 international oil and gas companies licensed in the region to date. The petroleum resources in the East African region are estimated at 2 billion barrels of oil in place and 3tcf of natural gas. Additional resources continue to be firmed up by aggressive exploration programmes in the region.

The East African Community organises biannual conferences and exhibitions on the petroleum potential and investment opportunities in East Africa. The East African Petroleum Conference and Exhibition (EAPCE) is recognised globally as a premier international forum for those working in the upstream petroleum sector. Participants include explorationists, researchers, investors, service providers, academia and financiers among others.

The conferences provide an excellent fora for the participants to exchange ideas and information about recent developments in the region, learn about new investment opportunities and share lessons learnt.

The East African Community will host the 5th East African Petroleum Conference and Exhibition 2011 (EAPCE'11) with the theme of harnessing East Africa's oil and gas potential and utilising the resources to create lasting value. The conference will be held in Kampala, Uganda, from 2nd-4th February 2011. For the three days, this city in the Pearl of Africa will become the place for the oil and gas industry players to gather, collaborate, conduct business and experience the showcasing of achievements in the sector.

Each of the previous four conferences has been more than just an international conference. EAPCE'11 will, like the previous conferences, provide participants with not only the opportunity to assess the developments in the petroleum upstream sector in East Africa, but also to explore the many and varied attractions of this large region that is known in Africa for its unique and diverse beauty.

All potential participants are therefore kindly reminded to mark their calendars and make plans to be part of this outstanding conference series. EAPCE'11 will feature an exceptional programme of technical papers, research posters with an impressive line up of invited speakers and panel participants together with innovative exhibitions. Before and after the conference,

there will be a diverse range of opportunities for delegates to enjoy geological field excursions and tours of wildlife conservation areas.

Uganda

There are six sedimentary basins in Uganda, out of which the Albertine Graben is the most prospective for petroleum exploration. The Graben forms the northernmost part of the western arm of the East African Rift System, stretching from the border with Sudan in the north to Lake Edward in the south, a distance of over 500km. The graben averages 45km in width and covers an area in excess of 22,000km² in Uganda.

Currently, the graben is subdivided into ten Exploration Areas (EAs), out of which five are licensed. The companies operating in Uganda include Tullow Oil plc, Heritage Oil and Gas Ltd, Tower Resources Ltd and Dominion Petroleum Ltd. Licensing has been suspended since early 2006 awaiting update of the country's regulatory framework for the upstream petroleum sector.

A National Oil and Gas Policy for the country was approved by Cabinet in 2008. In an effort to operationalise the policy, formulation of a new legislation for the oil and gas administration is underway.

Despite its significant size, only a total of about 5,522 line kilometres of 2D seismic data and 1,232 km² 3D seismic data have been acquired in the Albertine Graben to date. In addition, since 2002, 39 deep wells have been drilled in the area, the deepest of which, Kingfisher-1, reached a total depth (TD) of 3,195m. Thirty-six of these wells have encountered hydrocarbons in multiple reservoir intervals in the subsurface. This represents a remarkable drilling success rate of over 92 per cent.

To date, 16 discoveries of oil and/or gas have been made in the country in excellent quality reservoir sands and many of the wells drilled have intersected significant net oil pay sometimes in excess of 40m. The oil is generally light to medium gravity (API ~30 to 330) and sweet, with low gas-oil ratio and some associated wax. Eleven wells have been flow tested and some of the wells have registered cumulative flow rates of over 14,000 barrels of oil per day. The discovered resources in the graben are currently estimated at over 2 billion barrels of oil equivalent in place.

Tullow Oil and Heritage Oil and Gas have

commenced the appraisal of the discoveries made in their respective exploration areas and are currently working with the government of Uganda on plans for the development of some of the oil and gas fields and achieving oil production from the basin.

The government of Uganda has contracted Foster Wheeler Energy Ltd, a UK-based firm to carry out a feasibility study for the construction and development of an oil refinery in the country. The study will help to address among others the size, configuration, location, cost, financing options and markets for refined products.

Burundi

Various studies have been conducted since 1959 for petroleum exploration both in the Rusizi basin and in Lake Tanganyika. These basins are part of the East African Rift System and are situated between Burundi, Democratic Republic of Congo, Tanzania and Zambia. This Rift System is dated from Cenozoic (Tertiary) and is divided into two branches; the eastern arm and the western arm. Lake Tanganyika and the plain of Rusizi belong to the western branch which consists of a series of sedimentary basins marked by deep lakes (lake Malawi, lake Tanganyika). In Burundi the basins cover a size of 2,968 km². Gravity, aeromagnetic and seismic surveys have been conducted in the two basins and the average sediment thickness is estimated to be more than 3,000 metres. The exploration areas of Rusizi and Lake Tanganyika basins

have been divided into four blocks: A (793.1 km²), B (697.1 km²), C (664 km²) and D (813.4 km²). Block A is Rusizi basin which is an onshore area while B, C and D are in Lake Tanganyika, from north to south respectively.

The government of Burundi has continued to encourage oil companies to invest in petroleum exploration. The blocks C and D have been occupied by Surestream Petroleum Ltd since 2009 and the other blocks' applications for exploration have been registered. According to Surestream Petroleum Ltd, similar structural styles like those in the Albertine basin are expected in the Lake Tanganyika. Quantity and quality of oil reserves are not yet known.

Kenya

Exploration for oil and gas in Kenya has been going on sporadically since the 1950s. The country has four sedimentary basins, namely Lamu, Anza, Mander and Tertiary Rift. The total area under sedimentary cover is approximately 400,000km².

In these sedimentary basins which cover both onshore and offshore areas, a total of 73,392 line km of 2D seismic data has been acquired. In addition, 820 square km of 3D seismic data has been acquired in the offshore parts of the Lamu Basin.

The total number of oil exploration companies operating in the country stands at 12 while the number of licensed blocks is 22, out of the total number of 36 current exploration blocks. These numbers indicate the ►

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The East African Petroleum Conference



◀ highest level of exploration activity ever to be witnessed in the country. During the exploration history of the country, 32 wells have been drilled, the latest one having just terminated drilling and is awaiting the running of DST testing.

Rwanda

Situated in east-central Africa, Rwanda is a landlocked country bordered in the west by the Democratic Republic of Congo, in the north by Uganda, in the east by Tanzania, and in the south by Burundi.

With the total area of 26,338km², Rwanda has a population of 10 million. Steep mountains and deep valleys cover most of the country. Lake Kivu in the northwest, at an altitude of 1,472m, is the highest lake in Africa. Extending north of it are Virunga Mountains, which include Volcano Karisimbi (4,324m), Rwanda's highest point. As part of the western branch of the East African rift valley, Lake Kivu was formed in the course of the emergence of the Virunga volcano chain. This lake contains an enormous quantity of dissolved gas: an estimated 250 billion m³ of carbon dioxide (CO₂) and 55 billion m³ of methane (CH₄).

Given the aim for the Rwandan government to transform Rwanda into a middle income country by having its private sector act as an engine of growth, the tempering of the high cost of electricity must take place. Lake Kivu providing a safe and economical source of power comes as a means for the government to meet the country's aim and provide its population with an affordable source of energy and optional export of the excess energy. The government of Rwanda further engaged in the development of a modern gas production facility which is currently supplying 2 MW to the national grid.

This success of the pilot project has attracted many other developers not only for power generation but also for fertilisers and liquid fuel production. Currently in the exploration phase, the Canadian company Vangold and the government of Rwanda agreed to a technical evaluation agreement signed in October 2007. A magnetic and gravity survey that showed confident indications of a sedimentary basin in the western part of Rwanda and around Lake Kivu has been conducted. In order to define the potential of subsurface hydrocarbons, a seismic survey will follow the Environmental Impacts Assessment of this survey ongoing and the discussion on modalities for the next seismic exploration in the area.

Tanzania


Tanzania has over 400,000km² of sedimentary basins which cover the coastal basin, deep sea basins and inland basins. Various studies have been undertaken since 1952 for petroleum exploration in the basins.

Forty-five exploration and development wells have been drilled. Over 24,000km and 65,000km of 2D seismic data has been acquired onshore and shelf, offshore as well as inland lakes. Recently over 7,000km² of 3D seismic data has been acquired in the deep sea.

Exploration studies together with well drilling done in Tanzania have resulted in discoveries of four gas fields of which two are under production and the other two being under appraisal. Gas reserves for all discoveries are estimated to be in the order of 3 tcf.

Gas production from the Songo Songo and Mnazi Bay gas fields which commenced in 2004 and 2006 respectively and the gas use for industries and electricity power generation have motivated further exploration throughout the sedimentary basins in the onshore, offshore and deep sea to unveil more gas resources and oil. To date there are 21 Production Sharing Agreements (PSAs) covering most of the sedimentary basins in the country. In the period 2006-10, 12 exploration wells have been drilled. Further exploration drilling is being planned for the years 2010-12. It is expected that the first deep sea well will be drilled in this period. The deep sea drilling will herald a new era in the exploration for hydrocarbons in Tanzania and the region at large. Tanzania looks at these drilling campaign as playing an important role towards future exploration successes in the country.

In 2008, Tanzania opened up exploration for hydrocarbon in the ultra-deep sea areas. To date there are 12 exploration blocks in the deep sea with 7 blocks that thrive with exploration. The government has continued to encourage oil companies to invest in petroleum exploration in the country.

Continuation of negotiations with other potential petroleum exploration companies in open areas as well as forming into existing PSAs are undergoing. 

The 5th conference will be held in Kampala, Uganda, from 2nd-4th February 2011

East Africa's petroleum potential is enormous

