

OIL PRODUCTION PROSPECTS - MADAGASCAR

1. HISTORY

The presence of hydrocarbon deposits in Madagascar has been known since the 1930s but little effort was made to develop the resources for two main reasons:

- (i) The location of the fields which are mostly very remote from any obvious export route.
- (ii) The nature of the crude being very heavy and viscous and hence being difficult to handle.

These two considerations taken together made it hard to envisage how oil produced on Madagascar could be economically exported.

There were however individuals who believed that at least some of the oil could be profitably produced given the sweet nature of some of the crude which contains almost no sulphur and is therefore tradeable at a premium over most crudes. In 2004, Sam Malin and Alan Bond, founded Madagascar Oil Ltd. with a view to exporting oil from the Tsimiroro area.

2. DISTRIBUTION

There are two main prospective areas in Madagascar.

2.1. One is Bemolanga, situated at the North West of the island and straddling the coast. The Bemolanga reserves are, I believe, only producible as tar sands. Total prospected in the Bemolanga area for some time but did not attempt to develop the prospect.

2.2 The other prospective area is Tsimiroro, located towards the south west of the island, approximately 100 km inland. The nearest infrastructure is the very small port of Maintirano which is limited to a very small jetty of approximately 40 metres length approached by a very narrow creek. Most of the traffic is domestic supplies which are shipped in dhows, which are the deepest draught vessels that can be accommodated. The port otherwise handles a small number of refrigerated containers exporting frozen shrimps, caught locally, and the import of a very limited amount of diesel to feed the (very small) local automotive demand and to power the local diesel power plant which operates about 16 hours a day. This is delivered in small barges which are dragged up a slip and connected by hoses to Total's depot across the road from the slip.

In short, Maintirano port is far too small to offer a conventional export option to for the local crude. Madagascar Oil Ltd. drilled some wells starting in 2006, having imported a small truck mounted coring rig from the US. This very modest drilling unit proved adequate to drill a significant number of wells and saved the considerable expense of hiring and deploying a conventional drilling rig.



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The Tsimiroro area has one main field, Tsimiroro Main. The prospective reserves have been estimated at a number of levels from 1.7 trillion bbls in MOL's website which is no more maintained following the demise of MOL, down to 200 million bbls. It is not clear whether any of these estimates were ever scrutinised by the likes of Netherlands Sewell independent reserve report.

3. CRUDE PROPERTIES

Despite the very high viscosity and density of the crude in Tsimiroro Main, the crude is sweet (very low in sulphur) which will allow it to be traded at a significantly elevated price. In addition to Tsimiroro Main and located a short distance South are two fields, Tsimiroro South and Tsimiroro South East, which are much smaller than Tsimiroro Main but which contain much lighter crude. This lighter crude has useful potential as a possible diluent for the much heavier Tsimiroro Main crude. This would offer the possibility of using the lighter crudes to facilitate early export of the Tsimiroro Main crude without the need to import diluent.

4. Exporting the Oil

In the longer term, the only viable method of exporting the Tsimiroro Main crude is to import diluent and blend it with the Tsimiroro Main crude thus creating a fluid mix which can be exported conventionally by tanker. In addition to the Tsimiroro South and Tsimiroro South East crudes mentioned above, potential diluents include straight run refinery products such as straight run kerosene and naphtha. At one time, MOL commissioned a study of a heated pipeline to run from Tsimiroro Main to the coast (near Maintirano). The consultant specified a pipeline with pressure and temperature booster stations at intervals along its length.

The resultant cost estimate was, I believe, of the order of 5 billion USD which was not promising. Nor would a heated pipeline have offered a solution to the problem of keeping the crude fluid while loading a tanker at an SBM approximately 20 km offshore. An additional problem is the very shallow slope of the seabed off Maintirano. The (very small) container ship used to import the equipment used for the test drilling programme was not able to approach closer than about 20 km. to the shore. (The materials had to be delivered to Maintirano in a lighterage exercise using two tugs, two flat top barges and two vehicle landing craft). The exercise lasted approximately two weeks. Other infrastructure includes a road link between Maintirano and the field. This was constructed in two phases. Initially the Chinese constructed a sealed road from Maintirano up the West coast as an aid project to connect Maintirano to the rest of the island. MOL later bulldozed an unsealed flat access from the nearest point on the Chinese road to the Tsimiroro Main field. This road, being unsealed, requires a lot of maintenance. Tsimiroro is also connected by an older but sealed road to the capital, Antananarivo. Antananarivo is in turn connected by a sealed road to Toamasina, the island's only serious port, located on the East coast. Further pieces of local infrastructure include dirt airstrips at Maintirano and (constructed by MOL's civil contractor) at the Tsimiroro Main field. These can accommodate light aircraft only. In mid 2016, MOL installed a small blending plant at Tsimiroro Main. They then contracted one or more fuel importers to deliver parcels of marine diesel from Toamasina to the Tsimiroro Main blending plant where it was blended with Tsimiroro Main crude and then trucked to Antananarivo where it was used to power a single train of the government thermal power plant. The blend of marine diesel was fully mobile at ambient temperature and no special heating was required to keep the blend fluid during the transit from Tsimiroro to Antananarivo. This experiment was therefore successful but MOL did not follow it up.

5.0 Synopsis/Recommendations

The Madagascar oil fields have great prospects and potential and can help to grow the island's economy. However, in order to do so the right infrastructure should be set in place. A new solid road network system along with adjacent port facilities or offloading facilities with a buoy offshore is needed in order to export the oil. Portman Management Consultants can conduct conceptual, pre FEED and FEED studies, advise potential investors and companies on what is required to be built and evaluate the overall time frame and cost of the scheme.