

Floating LNG vessels in Africa: Africa's gas future is floating offshore

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There is a growing trend in sub-Saharan Africa to deploy Floating Liquefied Natural Gas (FLNG) technology to develop gas resources. Although generally much smaller (in terms of output), these units can be brought on-stream much more rapidly and cheaply than traditional on-shore LNG trains. FLNGs are increasingly seen as the solution to the problem of monetising African gas.

It is often pointed out that the excess of demand over supply in global markets is [a massive opportunity](#) for those African countries blessed with abundant gas reserves. But while gas economies along the Mediterranean littoral (Algeria, Libya and Egypt) are able to pipe gas directly to Europe, a very different process is required south of the Sahara.

Gas resources located more than 2 000 kilometres from market are by definition 'stranded'. But there is a solution – to liquefy them and transport the product, Liquefied Natural Gas (LNG), to buyers by ship. This has been how sub-Saharan Africa's gas riches have been developed since about the millennium. Large gas liquefaction plants have been built on-shore at locations like [Bony Island](#), in Nigeria's River State, where there are currently six gas trains in operation. These use feedstock from the oil platforms owned by international energy companies in the Gulf of Guinea. Until 1999, this feedstock was a waste product with most of it being burned ('flared off') in spectacular exercises apparently visible from orbit.

However there have been problems with the development of on-shore gas trains in many of the continent's biggest gas jurisdictions. In Nigeria, feedstock supplies have been disrupted by theft and sabotage on such a scale that the Bony Island facilities are able to operate at only 74 percent of capacity. The lost revenue was [reported in August](#), to have been US\$7 billion, so far in 2022.

In Mozambique's Rovuma Basin, location of the third-largest gas reserves in Africa, behind Nigeria and Algeria, the original plan for two gigantic on-shore LNG projects has been disrupted by an Islamist insurgency. One of the two consortia – headed by TotalEnergies – hopes to resume construction when the region has been secured. The other – headed by ExxonMobil – has not yet taken a Final Investment Decision.

But while the consortia were working to secure the long-term contracts needed to proceed, one of the members of the ExxonMobil consortium, Italy's ENI, pushed ahead with a smaller but wholly-offshore concept, a Floating Liquified Natural Gas (FLNG) vessel operating in the same gas fields. FLNGs are a new concept where the whole purification, liquification and shipment process is located in a floating space approximately one-quarter the size of an on-shore facility. Given space limitations, FLNGs produce less than the land-based alternative. Eni's Coral South FLNG has a capacity of 3.4 million tonnes per annum (mtpa), less than one-tenth of the combined output planned for the two gigantic on-shore facilities ([43 mtpa](#)).

The Coral South FLNG took the [first hydrocarbons onboard](#) for processing in July and was reported to be ready to send the first shipment in September. But there has been a delay. The sole buyer of all Coral South's production (for the next 20 years), British company BP, had despatched a vessel to pick up the cargo. But a technical issue – reportedly [damage to the FLNG's de-methaniser](#) system – has delayed the process.

Despite the recent hitch, the Coral South FLNG project is widely regarded as a success, especially when compared to the delays afflicting the on-shore projects in Mozambique. ENI said in July that it was considering acquiring a second FLNG for operations in the country. The deepening trend appears to be deploy FLNG vessels to circumvent the difficulties of operating in complicated frontier markets.

This is all very recent. The [first FLNG to be deployed](#), by Malaysia's Petronas, started production off Sarawak only in 2016. The lead company in FLNG development has however been Shell, whose Prelude FLNG (located off Western Australia) is claimed to be the largest floating object ever constructed with a displacement of 600 000 tonnes. It shipped its [first cargo in 2019](#). In between the two events, the FLNG phenomenon came to Africa.

The Hilli Episeyo, located 14kms off Kribi, Cameroon, sent its first cargo in May 2017, making it only the second FLNG to begin production. The vessel itself is a converted gas tanker, [built in 1975](#). The owner

and operator, Barbados-registered Golar LNG is currently [converting a second vessel](#) which it intends deploying in deep waters owned by Equatorial Guinea. That initiative, the Fortuna Project, has a [fraught history](#) involving changes of ownership and financing delays.

The greater flexibility and hence attractiveness of FLNGs compared to traditional on-shore LNG projects is illustrated by another ENI project in Africa. The Italian company [acquired the Tango FLNG barge](#) from previous owner the Exmar Group in August. ENI intends deploying the vessel to the Republic of Congo (Congo-Brazzaville). Tango had originally been built (in 2017) to be permanently moored at Bahia de Blanca in Argentina and was the [first FLNG in the Americas](#). The vessel was put up for sale at the height of the Covid-19 pandemic in 2020, when LNG demand was severely depressed. One commentator has suggested that the Tango example shows that FLNG projects can be [mobilised in as little as six months](#) so long as other conditions (contracts, mooring infrastructure) are in place.

There is interest in the new FLNG technology even in Nigeria with its well established on-shore industry. Earlier this year, the [African Export-Import Bank](#) (Afreximbank) announced that it would act as lead arranger and part-financier for a FLNG project located 60 km from the shore of Akwa Ibom State in Nigeria.

The [Grand Tortue Ahmeyim](#) gasfield off Mauretania and Senegal is also expected to utilise FLNG technologies. The significance of this project is that it will be the first ever deployment of [modular FLNG technologies](#). The modular approach which, as the name suggests, involves combining a number of small units, is a consequence of the emergence of the [US shale gas industry](#). It takes one of the major advantages of FLNG technology – its ability to monetise stranded gas reserves rapidly – to its logical extreme. A standardised small-scale modular plant can be built in [less than 18 months](#).

There is huge international interest in African gas at the moment. But getting traditional big on-shore LNG trains operational is a complicated, risky and lengthy process. A [best-case scenario](#) for TotalEnergies mega project in Mozambique suggests about 15 years can be expected between initial discovery and first deliveries to market. Major companies are simply no longer willing to make investment decisions against that sort of time horizon. FLNG's could thus represent the future for African gas.
