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African LNG - providing the West with gas

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Africa's LNG industry is the oldest in the world, with the continent having hosted the world's first liquefaction plant to come online at the Algerian port of Arzew in 1964 - built to supply gas to the UK and then France before the first major North Sea discoveries were made. Now, in addition to Algerian national Sonatrach's various facilities, Africa also has producing LNG plants in Libya, Egypt and Nigeria. These have a total capacity of nearly 51 million tonnes per year (51mtpa), most of which goes to Europe, with an increasing amount going to the US.

By the end of 2010, according to Infrastructure Journal research (see table below), Africa could have more than doubled its capacity to nearly 130mtpa - which will be a impressive achievement if fulfilled.

Africa's main markets for its LNG are in Europe and North America- collectively known as the Atlantic Basin. But its position as premier supplier to these import markets has recently been challenged by Qatar and its giant RasGas and Qatargas projects at Ras Laffan - which together should be producing 77 million tonnes a year by 2010 - around a third of the whole world's LNG production.

Several of Qatar's projects (RasGas 3, Qatargas 2 and 3 for example) have been put in direct competition with African ones because of the intended destinations for their cargoes in the Atlantic Basin. Qatar has also shown, through these massive LNG projects and others like Qatofin, an increasing ability to attract huge amounts of attractively priced international bank financing- something that African countries can only dream of.

Yet, despite this huge expansion of capacity in Qatar and the problems of investing and financing in Africa, the African LNG industry is moving forward at pace.

Nigeria is at the forefront; and while the country may have become notorious for tribal attacks on oil and gas facilities and pervasive corruption, it has a slew of LNG projects on the table - including further expansion of the already-large Nigeria LNG (NLNG) facility at Bonny Island plus the greenfield projects Brass LNG (10mtpa) and Olokola LNG (OKLNG - 22mtpa).

Further down the western coast, Equatorial Guinea (EGLNG - 3.4mtpa plus a second train likely) and Angola (Angola LNG - 5mtpa) have projects of their own on the go, with the first already three quarters of the way through the construction process. Cameroon is apparently considering joining the former of these, while additional projects have been mooted for Mauritania and Namibia but have been put on hold for now because of disappointing exploration results.

Meanwhile on the northern coast Algeria (which produced more than double Nigeria's output last year) has agreed to go ahead with its first LNG project involving foreign partners -Gassi Touil, with Spanish firms Repsol and Gas Natural through their new joint venture, Stream. National oil and gas company Sonatrach is also rebuilding the Skikda plant where an explosion killed 27 people in 2004 and destroyed three trains with 2.55mtpa of capacity.

However it is Egypt that has taken the lead in terms of project financing in Africa, with both Egyptian LNG (ELNG) trains having attracted funding from the banks, with the help of financial adviser Société Générale. The country's government has just issued approval for another 5.5mtpa train to be built at the competing SEGAS Damietta plant.

So, overall, it can be seen there is no shortage of activity on the African LNG front.

LNG project	Country	Sponsor(s)	Online	LNG Capacity (mtpa)	Gas Capacity (bcm/yr)
Arzew GL1Z (Bethouia)	Algeria	Sonatrach	1978	7.8	10.6
Arzew GL2Z (Bethouia)	Algeria	Sonatrach	1981	8.4	11.4
Arzew GL4Z (Camel)	Algeria	Sonatrach	1964	1.1	1.5
Gassi Touil LNG	Algeria	Repsol, Gas Natural, Sonatrach	2009	4	5.4
Skikda LNG GL-1K (existing)	Algeria	Sonatrach	2010	3.3	4.5
Skikda LNG GL-1K (replacement)	Algeria	Sonatrach	2010	4.5	6.1
Unnamed (Sonatrach/Statoil)	Algeria	Sonatrach, Statoil			
Angola LNG (Soyo?)	Angola	Chevron, Sonangol, BP, ExxonMobil, Total	2010	5	6.8
ELNG Idku Train 1	Egypt	BG, Petronas, EGPC, EGAS, Gaz de France	2005	3.6	4.9
ELNG Idku Train 2	Egypt	BG, Petronas, EGPC,	2005	3.6	4.9

		EGAS, Gaz de France			
SEGAS Damietta LNG Train 1	Egypt	Union Fenosa, ENI, EGPC, EGAS, BP	2005	5.5	7.5
SEGAS Damietta LNG Train 2	Egypt	Union Fenosa, ENI, EGPC, EGAS, BP	2009	5.5	7.6
Equatorial Guinea LNG	Equatorial Guinea	Marathon Oil, GEPetrol, Mitsui, Marubeni	2007	3.4	4.6
Marsa Al-Brega	Libya	National Oil Company	1970	0.7	1
Marsa Al-Brega upgrade	Libya	National Oil Company, Shell		3.2	4.4
Olokola LNG (OKLNG)	Nigeria	Shell, BG, Chevron, NNPC	2010	22	30
Brass LNG	Nigeria	NNPC, ENI, ConocoPhillips, Total, Centrica, BG	2010	10	13.6
NLNG Base project (Trains 1&2)	Nigeria	NNPC,Shell, Total, ENI	1999	5.9	8
NLNG Train 3	Nigeria	NNPC,Shell, Total, ENI	2002	2.95	4
NLNGPlus (Trains 4&5)	Nigeria	NNPC,Shell, Total, ENI	2006	8	10.9
NLNG Train 6	Nigeria	NNPC,Shell, Total, ENI	2007	4	5.4
NLNGSevenPlus	Nigeria	NNPC,Shell, Total, ENI	2010	8	10.9
Unnamed - Stream LNG	Nigeria	Repsol, Gas Natural, NNPC		7	9.5
Total existing				50.85	69.2
Total existing and proposed				127.5	173.3
Transported in 2005				33.5	45.5

All eyes on Nigeria

Frank Harris, an LNG expert at oil and gas consultancy Wood Mackenzie, says: 'One of our themes is that there are probably three countries in the world that in the next decade are set to become big players in LNG - Nigeria, Russia and Australia. Qatar is out of the game for the time being because of the moratorium they have put on new projects.'

Australia is more suited to supplying Pacific Basin countries in Asia and possibly the American west coast. Meanwhile Russia is yet to get its act together - largely down to political considerations, as continuing delays on the massive Shtokman project show. Iran is also out the game for the moment because of its nuclear programme, despite sitting on the world's second largest gas reserves behind Russia.

One project financier concludes an overview of the scene, saying, 'Because of all these issues it has dawned on everyone that there is a momentous reliance on Nigeria now.'

The rationale is simple. With 5 trillion cubic metres (176 trillion cubic feet) of proven reserves at the end of 2004, Nigeria has the largest gas resource in the whole of Africa - more than a third of the continent's total. Only Algeria comes close with 4.55 trillion cubic metres; next is Egypt with 1.85 trillion and then Libya with 1.49 trillion. To put it in context, North Sea producers Norway, the UK and the Netherlands have just 4.5 trillion between them while the US has 5.3 trillion.

At the moment Nigeria has one LNG facility in operation - the Nigeria LNG (NLNG) venture at Bonny Island in the Niger Delta, jointly owned by national oil company Nigerian National Petroleum Corporation (NNPC - 49 per cent), Shell (25.6 per cent), Total (15 per cent) and ENI (10.4 per cent).

NLNG's capacity is now an impressive 17 mtpa after Trains 4 and 5 became operational around the turn of the year, and there is more to come. Train 6's 4mtpa is due to come online by the end of 2007 while the NLNGSevenPlus project should deliver an extra 8mtpa when it comes on steam, hopefully in 2010. Lehman Brothers is advising.

Also in the offing are the mega US$7 billion OKLNG project (22mtpa) in Ondo State and the smaller Brass LNG venture (10mtpa) in Bayelsa State - the biggest new LNG projects being proposed for Africa at the moment. Final investment decisions on both are due around the turn of this year

The partners in these projects are:

OKLNG:

- NNPC
- Shell
- BG
- Chevron

Brass LNG (existing):

- NNPC
- ENI
- ConocoPhillips
- Total
- Centrica
- BG

Meanwhile the Repsol and Gas Natural's Stream venture recently signed a memorandum of understanding with the Nigerian government to set up yet another liquefaction plant in Nigeria - with an initial annual capacity of around 7 million tonnes. If all goes to plan, a joint venture company should be set up in around a year after initial studies.

Nigeria - many challenges, lots of hope

So there is plenty of activity planned for Nigeria alone. But what about the practicalities of actually getting these big projects done? Building new liquefaction plants like those planned requires huge investments and plenty of additional work securing sources of gas, offtake contracts from buyers and much more. And all of this in a context of spiralling construction costs across the world and a country-specific context of widespread corruption in addition to kidnappings and attacks on oil and gas installations.

Société Générale's managing director of oil and gas project finance Stephen Craen gives a good example of the difficulties of operating in Nigeria. He says: 'Like many banks our branch there was confiscated. But our situation was worse in that the people who took over continued to use our name. So we were reluctant to do business in Nigeria while the situation was outstanding. However this is now substantially resolved'

Since democratic elections were reinstituted in 1999, the government of Olusegun Obasanjo has made some progress in improving the political and business landscape. However Obasanjo has nearly completed his maximum of two terms under Nigeria's constitution and some uncertainty remains as to what will happen next. The recent spate of kidnappings and attacks on oil and gas installations is obviously a negative factor, though they are not seen as a major hindrance for getting projects off the ground.

One project adviser, who did not wish to be named, said: 'With a fair wind I can see progress, but the political situation will be the determining factor because there is an election in the next year and it is difficult for the bank market to get underwriting commitments before they know what the government is going to do.'

The welter of projects planned and required for Nigeria also presents problems in terms of capacity and potential costs of construction. Frank Harris of Wood Mackenzie says: 'With NLNG train seven, OKLNG and Brass, to some extent they are all competing with each other to get the EPC contractors and get the ships.' These issues inevitably feed into the financing process.

RBC Capital Markets' Head of Oil and Gas, EMEA, Uwa Igiehon says: 'Even for Nigeria there are tremendous challenges in developing the infrastructure and raising finance to bring the new LNG projects onstream before 2010.'

Simon Elliston, Citigroup's head of project finance for EMEA, agrees: 'The very idea of large scale financing in Nigeria is a challenge, so there will be a need to order these projects. For many years the country was in default, though it has recently been rated BB- by S&P. But the amount of money that Nigeria needs for infrastructure investments and its upstream and downstream projects is enormous. BB- does not give that.

He adds: 'It has taken Qatar Petroleum [lead partner in the RasGas and Qatargas projects] 15 years to get its tremendous access to debt. Nigeria needs to address its overall infrastructure to manage the development of its oil and gas infrastructure. It needs to build gas pipelines, LNG plants and address human resource issues. One would trust that the Nigerians will manage to do it in an orderly way. They have got allies in terms of the oil companies and the international banks.'

So far the successive NLNG projects have all been financed using equity, with the exception of NLNGPlus (Trains 4 and 5). This project managed to attract around US$1 billion in non-recourse financing in 2002 when Nigeria was still in default, with the backing of the ECAs and security of the previous LNG trains' cash flow. Citigroup was financial adviser.

Financiers are now very hopeful about the prospects though, and indeed each of the big upcoming projects have got financial advisers in place to help them through the process - Lehman Brothers for NLNGSevenPlus, Calyon for Brass LNG and RBS for OKLNG.

The demand is certainly there for the gas, with strong growth expected to continue in the Atlantic Basin import markets where West African LNG goes. Statistics from the US Energy Information Administration predict that annual North American consumption will rise 66 per cent to 45 trillion cubic feet between now and 2030, with

Western Europe expected to consume around 75 per cent more (31Tcf) - at a time their own reserves are apparently depleting.

Brass has already signed agreements covering all of its offtake and the other two major projects do not seem to be having too many problems of their own. However delays to at least some projects look inevitable and there are concerns that the Brass project partners might get distracted in sorting out their respective shareholdings following Chevron withdrawal to focus on OKLNG..

There are also worries about the capacity of Nigerian state partner NNPC to handle its significant share in all of these projects, since it is looking at an equity commitment of around US$1 billion for OKLNG alone even with a 70:30 debt/equity ratio.

The wider African scene - current activity and prospects

Nigeria may the focus of most peoples' attention at the moment, but there is plenty of activity elsewhere on the continent - both down the rest of the west coast and on the shores of Mediterranean where most of Europe's LNG has traditionally been sourced. Angola, Equatorial Guinea, Egypt, Libya and Algeria all have projects at various stages of the planning and construction processes.

Probably the most interesting LNG project outside Nigeria at the moment is Equatorial Guinea LNG on the west coast, with details of what should be an intriguingly-structured financing package potentially involving a second train expected soon. Taylor DeJongh is advising.

Harris says: 'Equatorial Guinea is interesting in that the first project is pretty well advanced. But the more interesting thing is the second train. There have been some probably rather ridiculous reports that the second train will be producing in 2009, but my understanding is that there is not enough gas from Equatorial Guinea itself, so they need a tie-in from Nigeria or maybe Cameroon. So there are difficulties there. But Equatorial Guinea has this reputation as a can-do kind of place, and the first train has been a success.'

It seems that Angola LNG could go the same way, with project financing to follow equity when the project is either mostly or completing finished. The partners in this venture are Chevron (36.4%), Sonangol (22.8%), BP, ExxonMobil and Total (13.6% each).

Société Générale's Stephen Craen says: 'Equatorial Guinea Train 2 is quite likely to move forward. But it is a bit like Egypt in the issue of getting enough gas to feed a second train, so they have been looking to their neighbours. I am always sceptical about projects which need second countries to get off the ground as it enormously increases the complexity and requires a great deal of time to renconcile the different commercial and political interests.

Meanwhile, on the north coast, Egypt has just decided to go ahead with another large 5.5mtpa train at the existing SEGAS Damietta plant, despite having plentiful domestic demand for its limited gas reserves in addition to several large-scale petrochemical projects on the table. Project partners Union Fenosa and ENI have considered project financing for this proposed second train.

However, Craen says: 'The problem is with financing it is that, while the Idku project was based on gas from the West Delta Deep fields and you can get independent reports on them, Damietta is not based on specifically identified sources so it is not possible to get reserves reports and is, therefore, more difficult to project finance.'

While Egypt has taken the lead in African LNG project financing, by way of the two ELNG trains, Algeria's Sonatrach has always used its own resources to fund projects and is not keen on using foreign banks. As a result, Gassi Touil and any other projects progressed there (for example a possible Gassi Touil 'lookalike' with Statoil) will probably be equity financed.

Harris says 'For my money the more interesting thing is that as we get into the next decade Algeria has got some excess capacity.' He estimates that from around 2009 onwards it should have an extra 8.5mtpa uncontracted after a contract with Suez expires and the Skikda revamp comes online.

Another intriguing prospect for the future is Libya, where Shell is currently working with the National Oil Company to expand the capacity of its aged Marsa Al-Brega plant.

Some project financiers are sceptical about prospects for the shorter term. Elliston for example says: 'Libya is a long shot because it has just come off the US embargo. It is a long way off, in spite of the oil majors' interest. It hasn't put its toes in the water yet.'

Craen adds: 'I know there is no current need for finance and the Libyans are not short of revenues. They are quite capable of funding their own requirements for the time being, although this may change if they opt for major new projects, in LNG for example.

Yet, from a legal standpoint, there is a somewhat different perspective. Jason Kerr, a partner at White & Case, says: 'Libya is looking more lively at the moment.'

Kerr points to a steering committee that the UK Law Society has set up as part of a government initiative to help Libya with its legal and regulatory framework. He adds: 'It is expected that a report of recommendations will be submitted to both governments in late 2006. The results of these may well set the pace of foreign investment in Libya in years to come.'

'It is the place for the future without a shadow of a doubt.'

Conclusions

Africa may well still be viewed with caution by many foreign investors, yet its burgeoning LNG industry shows how vital the continent is in terms of providing energy to import markets where demand continues to grow and grow.

Though Algeria and Egypt have both been providing some spot cargoes to India, Japan and South Korea over the

past few years, the overwhelming amount of LNG from existing and future African projects is bound for the Atlantic Basin, with an increasing bias towards the US. Indeed the US regulator FERC has just approved projects that will triple its import capacity to nearly 15 billion cubic feet per day - excluding further projects in neighbouring Canada and Mexico. And where there is demand, supply will follow.

In terms of financing, the international banks look set to take an increasingly prominent role in financing the projects proposed in Africa to satisfy demand. Egypt has already financed two trains using debt and Nigeria one, and several of the upcoming projects in Nigeria and elsewhere look set to make use of project finance.

Taylor DeJongh's chief executive Terry Newendorp says: 'It is interesting to note that the African projects have approached financing very differently than the Qatari or Omani ones. African projects have been much more equity-during-construction then using the cash flow for financing the next train. In part, it is because of the political risk element and the difficulty in obtaining bank capacity; and in part it has been driven by the timetables to hit the US market when gas shortages are keeping prices high.

He adds of EGLNG: 'The speed with which Marathon pulled off the Equatorial Guinea project is exemplary: less than 2 years from project definition to ground breaking. In the context of speed, sometimes sponsors don't want to be held up by the financing process.'

So the trend seems to be towards getting financing later on in the process, when progress can be evaluated and confidence increased in the viability of project structures.

Nigeria is and will continue to lead the way, though plenty of issues remain if all of its planned projects are to progress smoothly. As Elliston says, 'The Nigerian LNG scene is emerging by definition. It is on an upward curve, but they are still at the early stages of the curve.'

Whatever does happen though, it will certainly not be boring.