

## Downstream Focus

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# Power Generation Alternatives

## Can Africa benefit from new ideas blowing in from South East Asia?

Despite all the talk about Africa's electrification gap and the business opportunities lying in wait for companies wishing to participate in power generation and distribution projects, the majority of the continent continues to "live in the dark." According to some estimates, 60% of Africans still live without electrical power, and there is a yearly \$50 billion investment deficit in power generation. This seems the more unreal when we consider, for instance, that Nigeria is a major LNG exporter, that the Angola LNG project is shipping gas across the oceans, and that the recent East Africa gas play has given rise to more gas than what host nations and companies know what to do with.

Although most of the focus in recent years on power generation in the continent has been centered on renewables (a good example of which is the "G20 Africa Partnership" which recently received a new boost), the truth is that with so much gas waiting to be monetized, surely part of it can be used to drive electrification initiatives. There is also no shortage of countries in the region anxious to secure a reliable power supply that is crucial not only to improve the wellbeing of their citizens, but also to stimulate the industrialization of the continent that is seen as the next manufacturing hub for the world.

### From pipelines to small-scale LNG

One of the issues that arises most often when discussing natural gas use (and one that we have dedicated prior articles to in this publication to) is access to market. Sceptics often refer to the cost of building trans boundary pipelines, and the challenges of maintaining them secure. However, in our view this is a false question, with many examples not only worldwide (such as the many pipelines serving Europe) but also on the African continent of working pipelines that channel hydrocarbons from one country to another (the Chad-Cameroon pipeline, and the Mozambique-South Africa Pande-Temane pipeline, just to name two). If properly designed, a pipeline "backbone" can also be used to allow for tie-ins throughout its length allowing not only for the addition of new gas fields to the project, but also for transportation of gas reserves to power plants, factories, and other crucial facilities.

Another alternative that is being put on the table in Asia by Tokyo Gas and that, in our opinion, could be an interesting option also for Africa, is the use of small-scale LNG tankers to supply natural gas for power generation. Traditionally seen more as a producer and importer of natural gas for supply to domestic gas customers and for power generation in Japan, Tokyo Gas recently moved into an alternative line of business. Taking advantage of an opportunity for gas-fired power

generation in remote Southeast Asian islands (heavily dependent on oil and diesel fired power plants to date), Tokyo Gas is looking into building small LNG storage facilities connected to gas-fired power plants. It would then use a fleet of small-scale LNG tankers to ship LNG to these remote locations.

Although Africa is not made up of small remote islands, it nevertheless shares some similarities with Southeast Asia in terms of electricity generation gap and availability of natural gas close by. Using smaller LNG vessels and receiving terminals as envisaged by Tokyo Gas would simplify distribution up the east and west coasts of the continent, and be foreseeably easier to implement (at least technically) than building a myriad of cross-boundary pipelines up and down the coast. Although pipelines would then need to be built inland to serve landlocked countries, it would still be easier than building long-distance pipelines to serve all coastal countries.

From a commercial, legal and contractual standpoint a "small-scale LNG project" of the type described above would also be easier to structure than a complex multi-jurisdictional cross-boundary pipeline project. The only international component of the projects would be the LNG Sales and Purchase Agreements and the Gas Transportation Agreements. However, even these components would most likely be structured resorting to well implemented and widely accepted international industry model agreements, and little or no State-to-State negotiations (where typically things get more complex and bogged down) would be necessary. Additionally, a neutral choice of law would most likely be adopted that would avoid prolonged and messy negotiations around sovereignty and legal system differences from country to country.

Finally, each State's laws and regulations would apply to the licensing of the receiving, storage and power generation facilities. Due to the type of project, the risk could also be spread to different entities involved in the various phases of the project, thus facilitating the implementation of the scheme in an era where corporations are still reluctant to invest significant amounts of money in mega-projects.

### Financing

From a financing standpoint, such a project would also not be something completely new that both investors and financiers would struggle to structure. Gas-fired power projects have successfully been structured and implemented in many African countries, building on a proven track record that facilitates – and reduces costs of – financing.

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Many options involving LNG are being considered to solve Africa's power problem

Project finance models, in one form or another, are typically called upon to structure this type of venture. A "Small-scale LNG project" directed to power generation should be no exception, for all "classic" features warranting a PF type of financing would be found in these projects:

- (a) Need of a long debt repayment period;
- (b) Limited-recourse financing in view of the low liquidity of the project's assets; and
- (c) The possibility of highly foreseeable and stable cash flows.

Project cash flows (i.e., revenues generated by power supply) are, in effect, the main and most important security on which lenders rely upon. Foreseeable and stable cash flows are of the essence to ensure that a project is bankable, i.e. attractive to banks and their acceptance in advancing the funds required for its implementation. Given that security over fixed assets is value-limited (there are not that many parties interested in buying a second-hand, project-tailored turbine...), it is crucial that the project generates predictable and sustained revenues that ensure the permanent existence of sufficient cash flows to fund operational expenditures, serve the debt and generate a return on investment.

This raises an issue which is often a bottleneck for the financing of power generation projects: the creditworthiness of the off-taker. In Africa, national power utilities are frequently the only entity capable of entering into long term power purchase agreements from which the revenue streams flow. Having power utilities as the "natural" or sole off-taker is many times driven by market reasons, but it is also the

result of legal and regulatory constraints to the participation of private entities as direct purchasers of the power produced in-country.

The problem is that African power utilities are not the financially soundest companies one can find... They typically run on a deficit due to heavily subsidized tariffs which are needed to ensure that low income families (currently the vast majority of Africa's population) can afford to pay for at least some, even if very little, electricity to power their households. With a handful of exceptions, the balance sheet of the continent's power utilities is just not robust enough to give lenders the comfort that the project will generate a constant, steady, predictable and secure cash flow to repay the debt – simply because the project's sole off-taker (i.e., the entity which is the only source of revenue) may at any time default on their payment obligations under the power purchase agreement. Distressed power assets due to off-taker's default are a sad reality in many African countries and one with which lenders and sponsors are well familiar.

Two mechanisms have historically been used for credit enhancement purposes. The first, and most obvious, is to require a sovereign guarantee from the State where the project is to be implemented. Host nations are asked to guarantee the payment obligations of their power utilities, which is – in theory – the strongest guarantee one can have. However, sovereign guarantees are not, at least in our opinion, a panacea for the financing challenges found in Africa. The credit rating – the very financial capacity – of many African countries is not sufficiently high to enhance credit. States' finances are often as depressed as those of the power utilities. And even when States

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have a relatively sound financial condition, negative pledges provided for in facility agreements and donation protocols they have in place with other lenders or international donors often prevent them from providing this type of guarantee.

The other instrument which is sometimes thought of to enhance credit is an escrow structure under which the power utility's main customers (typically, industrial clients) are directed to pay their electricity bills to escrow accounts controlled by, or charged to, the sponsors (who frequently assign their rights to the lenders). The project then becomes ultimately reliant on the creditworthiness of the country's largest industrial consumers, rather than on the credit rating of the power utility (or on the States). The issue here is that there are only so many eligible industrial customers which can be called upon – probably enough for one or two projects but definitely not an infinite credit enhancement source.

As attractive as these mechanisms may look – and they are often the only way to ensure bankability – they are remedies to an original flaw: that the power utility is the only possible off-taker and that its balance sheet lacks the strength to make all players comfortable. Herein lies the opportunity, in our opinion, for “small-scale LNG projects.” As seen above, these projects are needed not only to bridge the electrification gap but also to boost industrialization in many African regions. Hybrid projects – combining electrification and industrialization (think of fertilizers, GTL, aluminum smelters, just to name a few

industries in high demand in Africa) – are perfectly fitted to overcome financing challenges. Where combination of power off-takers is possible – the power utility (in its role of electrification agent) and an industrial user of the gas supplied by the small-scale LNG project – bankability would be easier to achieve, to the extent that sources of cash flow are diversified and stronger off-takers' balance sheets (those of the international corporations developing industrial projects using the gas as feedstock) are brought into the equation. With so much gas being pumped around in Africa, there seems to be no reason to prevent the same gas-fed project to serve both purposes – to electrify and to industrialize. This would not only contribute to electrification and diversification of national economies (two of the major objectives of most governments on the continent), but also provide the necessary economic basis to allow financiers and investors to implement such projects, to the benefit of all. **P**

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