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Mozambique Domgas

Introduction

Cheap, available energy is often one of the biggest drivers of economic growth and social development.

In the past decade, as the discovery and development of natural gas projects in Northern Mozambique has unfolded, it has become clear to many that the economic landscape of Southern Africa could be changed forever. The development of this gas resource by the Mozambican government, together with several oil majors, has the potential to be the single biggest investment on the African continent, ever.

Over the course of this series, Deloitte will be taking a look at different sectors that could be impacted by this change in the energy landscape. In this first piece, we will be looking at the primary drivers behind this change, pricing and some of the potential investment numbers to give context to the larger economic impact.

The investment numbers are impressive. Standard Bank South Africa estimates that the amount invested in the next 10 years is set to total a whopping $128bn. This is the equivalent of investing 5% of the South African GDP each year for 10 years, or 8.5 times the Mozambican GDP. Let us look a little bit deeper into these numbers and where the investment will be going.

There are three natural gas liquefaction projects under development: Mozambique Liquefied Natural Gas (LNG) to be developed within Area 1, Coral South Floating LNG (FLNG) and Rovuma LNG, both to be developed within Area 4.

The Coral South FLNG project is being developed by ENI and ExxonMobil. Coral FLNG will be the world's first ultra- deep FLNG project. At $10bn, the floating liquification plant and developed offshore gas field will produce 3.4 million tonnes per annum (MTPA) from 16 trillion cubic feet (tcf) of reserves in the Coral South offshore discovery starting from by the year 2022.

This will be the first LNG produced in Mozambique as the floating solution offers a faster method to produce the gas versus the traditional onshore installations. As the gas will never touch the shores of Mozambique, there is no domestic gas (Domgas) obligation on this project.

Area 1, recently acquired by Total, is the second area set to be developed. Currently, it includes a $20 billion investment to develop the Area 1 field and onshore liquification trains. Final Investment Decision (FID) for Area 1 was reached in Q2 2019, with first gas expected in 2024. Importantly, the agreement signed includes a Domgas obligation of 100 million standard cubic feet per day (MMSCFD) which is a fixed amount of natural gas that will need to be consumed in the local market. This is equivalent to 0.7 MTPA, and it is expected that future agreements entered into with Mozambican authorities will also have similar Domgas allocations. Currently, the Mozambique LNG project is planning to produce 12.9 MTPA. Additional investment could result in a total of 43 MTPA (possibly completed by 2029). These will draw from the approximately 65 tcf recoverable offshore gas reserves in Area 1.

Rovuma LNG, developed jointly by ExxonMobil and ENI, is estimated at a $30 billion investment; although, FID for the project was recently delayed. At its completion, Rovuma LNG will produce 15.2 MTPA of gas in Area 4. The completion date was originally scheduled for 2025, but this will not likely be achieved due to FID delays.

Other potential projects which have been sanctioned by the Government of Mozambique include a Gas-to- Liquids (GTL) plant by Shell, a fertilizer plant by Yara, a 250 MW gas-to-power Plant by GL Energy Africa and potential Methanol-to-Olefins and Gas-to-Power projects. Based on the allocation of Domgas from Area 1 alone, however, additional possible uses for the gas certainly warrant further consideration

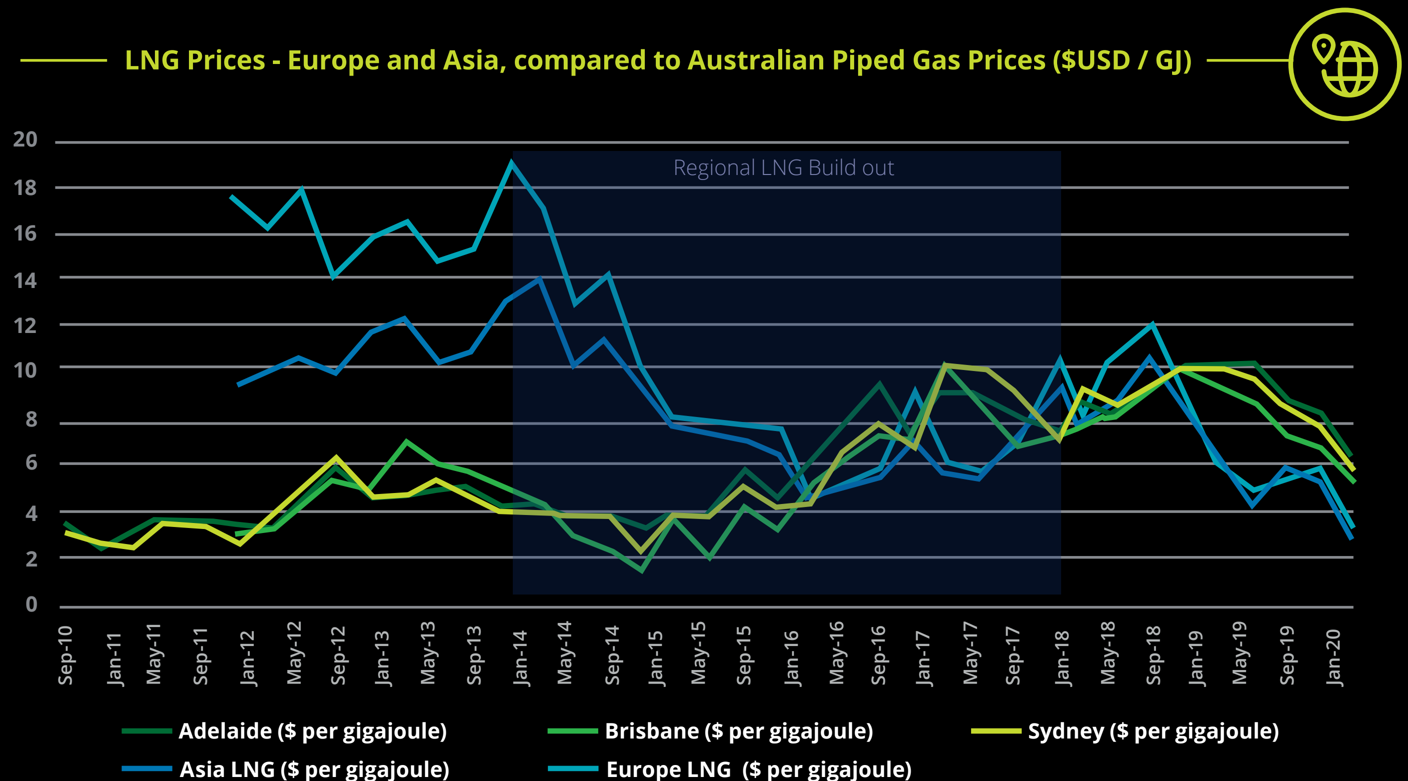
The impact of this investment on the economy of Mozambique will be significant, from the supply of equipment for construction, to the housing and services for the onsite project workforce. Apart from the economic impact and increased revenue to be gained by the Mozambican government, another key aspect for economic growth will be the Domgas allocation, not just for Mozambique but also for the Southern African region.

The significance of the Domgas allocation and economic impact in Southern African markets will depend on what the final pricing of this allocation ends up being. Natural gas, and specifically Liquified natural Gas (LNG) and compressed natural gas (CNG), are unique in that these primary energy sources can displace other forms rapidly once the price points become favourable. With recent technologies, development hurdles that had previously prevented this gas proliferation are now becoming easier to overcome. In a comparable way to how investment in an economy has knock-on effects, so too the injection of this allocation to the regional energy market will have consequences for all sectors.

Regulatory and political backing supporting this energy transition will be indispensable in terms of: creating the enabling investment environment, promoting open competitive markets, setting the right policies to attract large off-takers while also benefitting small and medium-sized enterprises (SMEs), as well as having a clear and public strategy.

As a case study, Australia's LNG developments are a helpful example relevant to anyone interested in how the future regional energy market could look. In 2012, Australia brought online its first new LNG production.

Between 2014 and 2018 the bulk of LNG liquefaction trains were built. As of 2019, Australia exports 61.7 MTPA, rising to a market dominating position rivalled only by Qatar in less than a decade. The impact on the local Australian market is a lesson for any economy developing natural gas and LNG projects. Australia, like many natural gas producers, had for years consumed almost all natural gas locally, at a price point favourable to industry consumers. With the addition of natural gas liquefaction and the ability to export this natural gas, the domestic market price for natural gas began to track the international price for LNG. This has been the case for many isolated domestic natural gas markets – once LNG production is developed, local gas prices begin to track international prices. In Australia, this resulted in a 5-fold increase in the domestic natural gas price as the international LNG market netted the producer a higher price than the local market. This had a substantial impact on local industries that relied on the lower primary energy input costs.



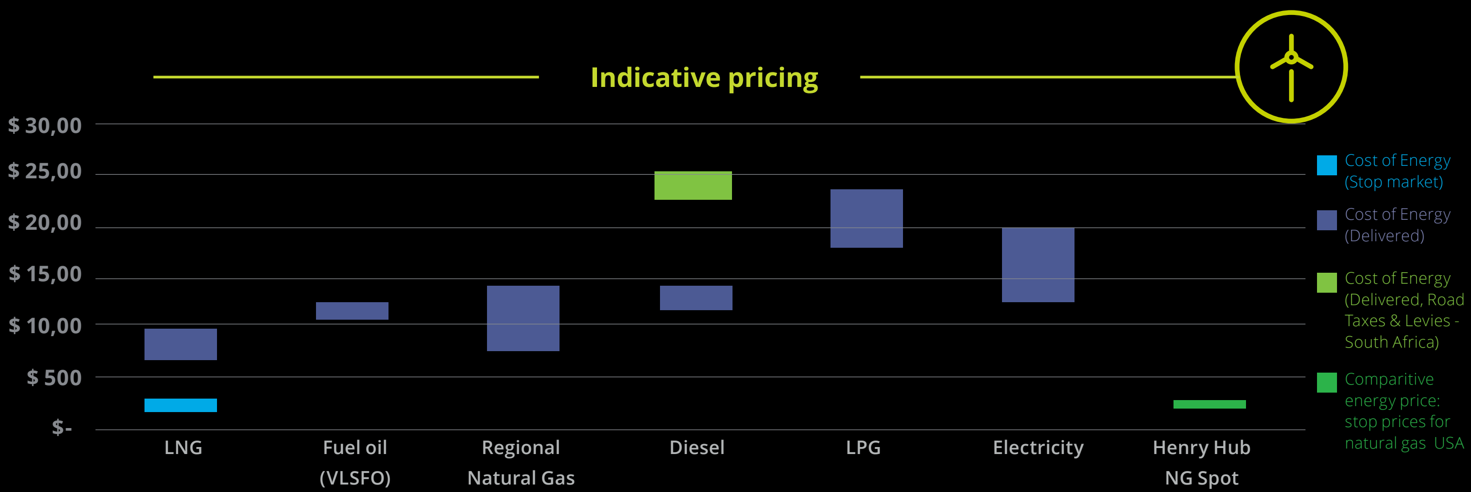
Regional Natural Gas and Global LNG prices started to converge between 2014 and 2018 corresponding to the years with the biggest LNG capacity build out.

The result in Southern Africa will be the same, albeit with a slightly different outcome. The local natural gas price will begin tracking the international LNG price. The difference is that the current regional price is higher than the international LNG price; as such, a significant reduction in natural gas prices can be expected across the region, this represents a significant opportunity.

To effectively compare the different primary energy options and determine how impactful the introduction of Domgas might be, we can compare the cost of different forms of energy. The current spot price for LNG is around $2.10 - $3.16 per Gigajoule (GJ). With delivery, estimated cost is expected to be $5.80 to $8.74 per GJ. This gives a good indication of where the future price of regional natural gas and LNG could trend towards. This is considerably lower than the current $7.65 to $14.12 per GJ for the natural gas market in Mozambique and South Africa making natural gas an excellent option, which could create a potential market once access opens up.

Compared to an average electricity tariff which would be equivalent to $12.42 to $19.61 per GJ, natural gas is an excellent alternative choice for industrial and heating use when available. Availability is increasingly rare as the Pande and Temane gas fields start reaching end of life. Fuel oil sells for between $9 to $10.62 per GJ while diesel comes in at $11.62 to $14.11 per GJ, with levies and taxes this increases to $20.30 to $22.79 per GJ. Liquid Petroleum Gas (LPG) is typically $17.65 to $23.53 per GJ. Any technology that enables industry to transition from one of these higher cost fuels to CNG or LNG has a large economic driver behind it.(Notes)

Indicative pricing



Considerable difference in energy cost for LNG and regional sources points towards a decrease in pricing when the LNG infrastructure is built. (Refer to Notes)

If the economics of LNG are so favourable, why hasn't LNG already been imported from elsewhere? And what will producing LNG in Mozambique change for the regional energy markets? The answer is firstly supply and secondly access.

Firstly, market access up until now has been limited. The cost of the infrastructure to import, store, transport and regasify imported LNG is prohibitive. Significant quantities and large long-term off takers are needed to cover the upfront capital investment. There needs to be a first mover in the importation of LNG. Total has signed a Joint Development Agreement with Gigajoule to develop a Floating Storage and Regasification Unit (FSRU) in Matola, Mozambique, opening the door for regasified LNG to enter the Rompco Pipeline and make its way to South Africa. Once an FSRU is in place, it is a much smaller step to bring LNG onshore opening other potential opportunities.

Secondly, the supply side has changed. The Domgas allocation, which is gas that must be consumed in the regional market will create a "push" for Mozambican producers to find regional users to consume natural gas or LNG at the best price.

With these changes in primary energy, the net effect for the regional economy will, without a doubt, be positive. Although there will be more winners than losers, the change will leave some reaping the benefit while others will be left behind. Those who succeed will 1) find ways to navigate the changing technology options while enabling flexibility in the switchover and 2) be those who are able to adopt business models and operating models that allow for a transition to gas.

Over the next several weeks, Deloitte will be looking at how this might change your industry. We will be analysing the opportunities and risks of this important change in the local energy market as well as in different sectors throughout the regional economy. We will look at the technology that drives these changes and how best to position yourself and your businesses to take advantage.

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Notes:

Primary energy cost estimates

Diesel (Untaxed)- R7.09-R8.61 per litre	= $11.60-$14.10 / GJ.
Diesel (Taxed) – R12.39-R13.91 per litre	= $20.30-$22.80 / GJ.
LPG – R15 to R20 per kg	= $17.60-$23.50 / GJ.
Electricity – R0.76 - R1.20 / Kwh	= $12.40-$19.60 / GJ.
Fuel Oil - $40-$50 / barrel ($2.45/GJ delivery)	= $8.99-$10.62 / GJ.
Henry Hub gas Price - $2 / MMBtu	= $1.80 to $2.80 / GJ.

This piece is based on future scenarios developed by Deloitte, and they rely on assumptions about the market that may or may not be true in the context of every business. Strategic business decisions should only be taken based on deeper analysis that involve: taking into account the particular position and aim of your business, a deeper review of the market, a review of technological and logistical barriers, having a sound business case and implementation road map that addresses risks not necessarily mentioned in this piece. Figures quoted are indicative based on market research but are location and volume dependent and may be subject to change.

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