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The Petroleum Industry in Zambia: Challenges and Opportunities

Summary

Petroleum plays a crucial role in the running of Zambia's economy as most sectors use petroleum as an energy requirement. All petroleum products in the country are currently imported which make petroleum a significant component of the country's import costs. The petroleum industry consists of TAZAMA Pipelines, Indeni Refinery and the Ndola Fuel Terminal. The industry however faces a number of challenges some of which can be categrised as external such as the volatility of prices due to exchange rate fluctuations and internal such as the status of petroleum infrastructure among others. An analysis of the laws in the petroleum sector shows that the Petroleum Act and the Petroleum Exploration and Production Act are outdated and inadequate.

The Petroleum Act continuously refers to local councils to regulate the petroleum industry while this is the role of the Energy Regulation Board. Also, pertinent guidelines are not indicated in the Petroleum Act which include the regulation of filling stations and standards for petrol, diesel and other petroleum products. The ERB therefore uses the Standards Act No 4 of 2017 for regulation and not the petroleum act. Additionally, for functions such as the marking of fuel, this is not guided in the petroleum act and is thereby being guided under the Statutory Instrument (SI) Energy Regulation (Fuel Marking and Monitoring) Regulations, SI 69 of 2017 which is done to detect and combat vices such as dumping and smuggling and fuel adulteration. This law is therefore outdated.

The Petroleum (Exploration and Production) Act 2008 is seen to be inadequate as various loopholes have been identified in terms of the government's participation, local citizen's participation and beneficiation and even the fiscal regime. To ensure benefit of Zambians from the discovery of petroleum it is important to ensure that the law includes mechanisms in which local people can be empowered if this resource is discovered in Zambia. The status of the petroleum infrastructure is also a challenge. The current pipeline and refinery infrastructure cannot meet the current and the forecast future demand requirements. At present, the refinery's production can only meet about 50% of national demand. The 1,710km Tazama pipeline is old and corroded and as a result, the pipeline capacity has been reduced. The continued maintenance of the existing pipeline is not considered to be sustainable with the high levels of corrosion.

Other challenges in the sector include the increase in illegal fuel vending, the high taxes imposed on fuel leading to high pump price of the commodity as well as transparency concerns in the procurement of feedstock. There is need to address the various challenges in the sector as consumers end up paying higher costs for petroleum products due to the inefficiencies in the sector.

There are also a number of opportunities within the sector to deal with the demand of petroleum and also make it more affordable. Rail transport is considered a cheaper alternative to road. If Zambia's rail system is upgraded, then it can offer a good alternative to transportation of fuel if a new pipeline is no built-in order to increase the supply of fuel. There is need to create a proper investment environment to allow for fuel to be supplied affordably to consumers. There is also an opportunity for biofuels from maize, cassava, soya beans, sugarcane and so on which can help boost agriculture especially for the rural population and out grower schemes and thereby reducing the poverty. This, however, requires a well-defined policy and regulatory environment.

The petroleum industry can be improved for players if the Petroleum Act and the Petroleum (Exploration and Production) Act 2008 are revised, infrastructure needs in the sector are dealt with, transparency in the procurement of fuel is improved, the tax regime is revised to reduce prices and illegal fuel vending is curbed.

Detailed Analysis

The petroleum value chain consists of what is known as upstream, midstream and downstream activities. The upstream activities are at the beginning of the value chain which are the Exploration and Production (E&P) stages. Infrastructure such as transport which include pipelines, access to roads, rail and ports and storage facilities are needed at various stages in the value chain to facilitate the link between production and processing facilities and between processing and final customer. These parts of the value chain are referred to as midstream. Finally, the Refining and Marketing (R&M) of the petroleum stage is referred to as downstream. The upstream petroleum industry in Zambia is still in its infancy as it is at the exploration stage and no production has occurred yet. Therefore, Zambia obtains its petroleum products through imports. In Zambia the Energy Regulation Board deals with pricing and regulating the quality of petroleum while the Ministry of Energy is responsible for procuring the petroleum.

The main players in the Zambian petroleum value chain are:

• **TAZAMA Pipelines Limited** - the pipeline runs from Kigamboni in Dar-es-Salaam to the refinery at Ndola in Zambia. This provides pipeline transportation of feedstock to the refinery and is a natural monopoly. Most of Zambia's crude oil imports are transported via Tanzania through Tazama Pipeline are refined domestically at the Government-owned Indeni refinery in Ndola.

• **Indeni Petroleum Refinery Limited** - located in Ndola and commissioned in 1973 Indeni refines the petroleum feedstock received through the TAZAMA pipeline. The refinery has an installed capacity of 1.1million tonnes of feedstock per year. However, due to the poor state of the refinery, its current operational capacity is now estimated at 800,000 MT. [1]

• **Ndola Fuel Terminal** - was constructed for storage and distribution of petroleum products and is the selling point of refined petroleum products from INDENI Refinery. The products are sold to privately owned Oil Marketing Companies (OMCs) who distribute and market petroleum products locally.

• **Bulk fuel storage depots** - Government commissioned bulk fuel storage depots in Northern and Lusaka Provinces. Other depots are also currently under construction in Western and North-Western Provinces, the two districts of Mongu and Solwezi, respectively. These depots are meant to decentralize the distribution of petroleum products and provide relief to the Ndola Fuel Terminal.[2]

• **Oil Marketing Companies** - Oil Marketing Companies (OMCs) distribute and market petroleum products, locally. All Oil Marketing Companies in Zambia are required to be registered with the Energy Regulation Board (ERB).

OMCs distribute are mainly, Petrol, Kerosene, Diesel and Jet fuel and other products such as Heavy Fuel Oils, LPG and Bitumen are sold directly to large users from INDENI Refinery.

Adequacy of the current policy and legal framework governing the petroleum industry

The laws and policies governing the petroleum sector include the National Energy Policy 2008, the Energy Regulation (Amendment) Act, No. 23 of 2003, the Public Procurement Act No. 12 of 2008, the Petroleum Act and The Petroleum (Exploration and Production) Act 2008. This paper analyses the Petroleum act enforced by the ERB and the Petroleum exploration and production Act enforced by the Ministry of Mines.

1. The Petroleum Act - An Act to make provision for regulating the importation, conveyance and storage of petroleum and other inflammable oils and liquids and to provide for incidental matters. This act is quite outdated and does not govern most of the functions of the Energy Regulation Board (ERB). The act was meant to be implemented under local councils instead of ERB so it is somewhat defunct. Also, the act addresses the transportation of "dangerous petroleum" which consists of the products that do not have energy values. The ERB is only interested in the ones which have energy value. The ERB therefore uses the standards act for regulation and not the petroleum act. The ERB uses the Standards Act No 4 of 2017 to guide the regulation of filling stations and develops standards for petrol, diesel and other petroleum products under the standards act. Additionally, the ERB commenced the marking of fuel in Zambia for domestic consumption. This is being guided under the Statutory Instrument (SI) Energy Regulation (Fuel Marking and Monitoring) Regulations, SI 69 of 2017 which is done to detect and combat vices such as dumping and smuggling and fuel adulteration. It primarily seeks to eliminate dumping of transit fuel and/or smuggling and adulteration of fuel with inferior products such as Kerosene (commonly referred to as paraffin) and/or contamination of fuel. The Petroleum Act which does not guide on elements such as fuel marking and regulation of filling stations is therefore, outdated and needs to be repealed.

2. The Petroleum (exploration and production) Act 2008 - An Act to regulate petroleum exploration, development and production in Zambia and to provide for title to and control of petroleum in Zambia. This law has various loopholes which include the level of government participation in the sector. Government's participation needs to be clearly defined as currently the mode for Government participation in the sector is unclear. Also, the tax regime has not been well described in the event that petroleum is discovered in the country. This law can also include a revenue sharing mechanism for local communities to ensure that benefits from the resource can be ring-fenced for community development. Lastly, there is the lack of provisions for the creation of a local content vehicle to enable participation by Zambians as employees at senior management level, suppliers of goods and services and shareholders in the projects. This needs to be included to ensure that Zambians participate in the petroleum value chain.The two Acts are thereby seen to be outdated and inadequate and need to be revised in order to be relevant to the sector.

Status of petroleum infrastructure

The petroleum value chain can be further split into eight sub segments which are procurement, pipeline transportation, bulk storage, refining, road and rail transportation, distribution, retail and blending, packaging and trading in lubricants. Looking at petroleum infrastructure in particular pipeline transportation, bulk storage, refining, road and rail transportation and distribution are the main components. According to the Ministry of Energy the Petroleum sector in Zambia is at a critical point, as the current pipeline and refinery infrastructure cannot meet the current and the forecast future demand requirements[3]. These assets are all over thirty years old and require some investment to make them more efficient. At present, the refinery's production can only meet about 50% of national demand[4].

The 1,710km Tazama pipeline is old and corroded and as a result, the pipeline capacity has been reduced. The continued maintenance of the existing pipeline is not considered to be a sustainable option going forward, given the existing levels of corrosion and the increase in throughput required to meet current and projected demand.

The Indeni refinery is operating within the constraints of an older straight run spiked crude refinery where the demand profile has changed significantly over the years. With higher growth in demand for gasoil and petrol, crude oil imports have had to be heavily increased.

Rail transport is also used to transfer petroleum globally. It is more expensive than road transportation but it is cheaper than road transport. Ndola and Lusaka have rail sidings set up for rail transport of petroleum products but these are not currently used. Zambia and its neighbours have a rail infrastructure which needs major upgrading and investment, policy review and a framework to restore the competitiveness of rail networks.[5]

How does the industry supply chain affect the pricing of petroleum products?

The Energy Regulation Board is responsible for the regulation of fuel prices in Zambia. There are two ways in which the Board regulates pump prices:

- the Cost-Plus Model and
- the Uniform Pricing Model

The Cost-Plus Model operates on the principle that the final price of petroleum products recovers all costs incurred in the fuel supply chain, that is, starting from the cost of product to the final price the consumer pays. The government or other industry intermediaries must not subsidize the cost. The Cost-Plus Model for setting pump prices was imposed by the Board in 1998 and was briefly abandoned in 2004 for the Import Parity Pricing (IPP) methodology which was primarily adopted as a way of improving operational efficiencies at the Indeni Refinery by benchmarking with other international refineries. The Import Parity Pricing was in use until 2008 when there was a shift back to the Cost plus Model following a public outcry on the frequency of the monthly price adjustments under the IPP methodology.

The ERB uses the CPM to determine the wholesale price of all the refined products at the Indeni Oil Refinery and the pump prices for petrol, diesel and kerosene.

In arriving at these prices, the model takes into account the costs incurred along the petroleum supply chain from the port of discharge in Dar-es-salaam to the Refinery where the feedstock is processed up to the Ndola Fuel Terminal where the product is stored and sold.

- The Cost elements in the Wholesale Price include
- Cost-Insurance-Freight
- Ocean Losses
- Wharfage
- Finance Charges
- Collateral Management Fees
- Insurance
- TAZAMA Storage Fee
- TAZAMA Pumping Fee
- TAZAMA Pipeline Losses
- Agency Fee, Processing Fee
- Refinery Losses
- Terminal losses[6].

The build-up to the pump price constitutes
- the fuel terminal fee
- respective statutory excise duty on the different products,
- the OMC margin
- Dealer margin
- transporters margins which are all determined by the ERB,
- the ERB fees of 0.7% of turnover
- the strategic reserves fund (for infrastructure development in the sector and procurement of strategic reserves) and
- VAT on products.

The Uniform Pump Price (UPP) System is another fuel price regulation mechanism adopted by the ERB and implemented in September 2010. The UPP requires that fuel prices be the same at all retail sites in the country. The UPP entails that the country has the same price of fuel at all retail sites. The Government established the UPP fund, administered by the ERB, to facilitate the cross subsidization of "rural" consumers by "urban" consumers.

Determinants of petroleum prices

Globally, petroleum prices are influenced by the international petroleum product prices and the exchange rate in the respective domestic economies. In Zambia, fuel prices are largely influenced by fluctuations of the Zambian Kwacha against the United States Dollar exchange rate. Changes in the international petroleum prices and exchange rate could trigger a price adjustment. Other factors that can initiate a price adjustment are changes in cost structure such as levies, duties and fees, margins for transporters, OMCs or dealers and pumping or processing fees[7].

Challenges

The following are the main challenges observed in the petroleum sector:

• There is need to improve the status of the major infrastructure in the petroleum supply chain which are the refinery and the pipeline as these are now old and dilapidated and reducing the supply of petroleum in the country.

• Increase in illegal fuel vending. There has been an increase in illegal fuel vending especially in rural areas due to the absence of licensed fuel stations especially in rural areas. Also, the lower retail fuel pump prices in neighboring countries makes buying fuel from neighbouring countries cheaper and thereby smuggled in the country and sold at lower prices.

• The energy sector regulator, ERB and the CCPC are obligated by the Acts that established them to work together in tackling competition issues in the energy sector. However the CCPC is grossly underfunded. The Commission has failed to establish its physical presence in other parts of the country. The Commission is unable to attract, train and retain competent staff. The Commission is also facing other operational challenges, including inadequate office equipment, office supplies, and, inadequate and unreliable transport.

• The pricing of petroleum products is influenced by the volatility of international oil prices and the exchange rate of the kwacha to the Unites States dollar.

• Zambia has one of the highest tax regimes on fuel in the region and consequently one of the highest fuel prices. The Fuel Terminal Fee, Excise Duty, Dealer Margin, ERB Fees, Strategic Reserves Fund and VAT at 16% are the major taxes and fees that increase the price of fuel from K9.49 at wholesale price to a pump price of K15.98

• Lack of transparency in the feedstock procurement as there have been concerns on the authenticity of the cost of feedstock which is the main factor for the determination of the petroleum wholesale price.

Opportunities

• Rail transport globally is considered a cheaper alternative to road. Zambia and its neighbours have a rail infrastructure which needs upgrading. However, rail transport is a low priority placed by the government on extending the rail network from Angola/DRC to Zambia and within Zambia. Whilst the necessary level of investment and development planning would be substantial and the time for implementation extensive, it is an option that merits further consideration in the future especially if no new pipeline is built.

• Fuel is a vital part of our economy despite its cost price. The need for transportation fuel creates opportunities for investment in the sector. There is need to create a proper investment environment to allow for fuel to be supplied affordably to consumers.

• There is an opportunity for biofuels from maize, cassava, soyabeans, sugarcane and so on and these include ethanol, bio diesel (Jatropha and soya beans). These biofuels can help boost agriculture especially for the rural population and out grower schemes and thereby reducing the poverty. Rural farmers will have a readily available market for their produce. However, there is need a well defined policy and regulatory environment.

Recommendations

The following are some of our recommendations:

1. The Petroleum Act and the Petroleum (exploration and production) Act 2008 needs to repealed as the Petroleum Act is outdated and the Exploration and Production Act needs to be revised to include important measures such as local participation and revenue sharing.

2. The Indeni Petroleum Refinery Limited must be urgently rehabilitated and upgraded to allow it meet the regional specification for unleaded petrol and low sulphur diesel and reduce pipeline losses. There is need for a new pipeline given the state of the existing pipeline and the infrastructure.

3. The government needs to review the tax regime on petroleum products which are pushing fuel prices up. The government can consider reducing or scrapping off some of the institutional taxes and duties levied which adversely affect the final price of fuel.

4. The ERB needs to deal with illegal fuel vending. Due to the higher fuel price in Zambia compared to those of its neighbours, OMCs with service stations in border towns have complained of rampant illegal fuel vending which has grown to levels that makes the illegal fuel vendors significant players in those markets.

5. The Competition and Consumer Protection Commission should be adequately funded by Government, by a fee to be paid by companies at the time of registration and/or at the time of submitting their annual return.

6. Measures need to be undertaken to improve transparency with regards to procurement in the sector. The procurement should be done in a transparent manner through a competitive bidding process and the awarding of contracts should be done in a transparent manner in accordance with the provisions of the Public Procurement Act, No. 12 of 2008.

Endnotes

1. https://unctad.org/en/Docs/ditcclp2011d1_en.pdf

2. http://41.77.4.165:6510/www.pmrczambia.com/wp-content/uploads/2015/06/Fuel-Procurement-Infographic.pdf

3. https://www.moe.gov.zm/download/other-documents/Study-on-the-Supply-of-Petroleum-Products-into-Zambia-24-Nov-2014.pdf

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6. https://static1.squarespace.com/static/52246331e4b0a46e5f1b8ce5/t/56f12c9727d4bd8d4217aa4d/1458646171309/Deborah+Bwalya_Cost+reflective+price+regulation+of+petroleum+in+Zambia.pdf

7. http://41.77.4.165:6510/www.erb.org.zm/reports/esr2018.pdf

Editor's Note

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