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Reflections on the Indigenization of Ghana's Petroleum Downstream Industry (OMC AND BDC activities) and the Possible Upshot on the Country

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ABSTRACT: In developing countries, indigenization is a common policy and legislation tool implemented to increase and promote local content and local participation in the various sectors especially the natural sector. However, these policies and legislation produce mixed results as reported by industry players and researchers. In 2005, the act setting up the National Petroleum Authority (NPA), the regulator of Ghana's petroleum downstream, placed enormous responsibility on the authority to enhance the indigenization of the oil and gas industry in the downstream sector. In relation to this key mandate, the National Petroleum Authority, led by its new chief executive, Dr. Mustapha Al-Hamid, unveiled a major change in state policy with regards to the indigenization of the structure of the sector. This paper seeks to identify and thoroughly examine the possible impact of this impending indigenization of Ghana's downstream oil and gas industry. Positive impacts such as the infrastructural development in the country, the reduction on foreign control of the economy, the increment in revenue, the indigenous participation and self-reliance it brings to the country are the essential benefits. However, the discouragement of foreign investment as well as the wealthy hijacking the economy will have an adverse effect on the positive impact.

KEY WORDS: Indigenization, Oil and Gas, Downstream, Energy

INTRODUCTION

In the 1960s and early 1980s, most theories claimed that the presence of natural resources (such as gold, oil, diamond, timber, etc.) in any country would lead to rapid development (Karl 2007; Rostow 1990). This resulted to a massive dive into the discovery and exploitation of natural resources especially the resources with large value in those days. Ackah and Mohammed (2020) posited that the pattern of development among developed countries such as United States of America, United Kingdom, Germany, Canada and so on, follow the theoretical claim that links the discovery and exploitation of natural resources to accelerated development.

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Similarly, Rostow (1990) argued that natural resources extraction was directly linked with industrial advancement, a necessity for economical and infrastructural development. Drake (1980), another person from the same school of thought, identified the presence of natural resources as an avenue that would open domestic markets and ensure investment capital needed for industrial development; as cited in Rosser (2006).

Despite a country's potential to develop due to the presence of natural resources, questions arose in the 1980s on the contributions of the resources to the development of many developing countries. Some authors like Auty (1993) believed the lack of capacity to manage the revenues from the extracted resources, leading to corruption and mismanagement, in many developing countries was the cause. It was no surprise when Sachs and Warner (1995), using the economic growth rates of ninety-seven countries between 1970 and 1989, to enable them delve deeper in an attempt to understand how the presence of natural resources impacted these countries development, ascertained that countries endowed with an abundance of natural resources tend to develop less rapidly than those with few natural resources.

The claim (curse) on development being at a slow pace in countries with profuse natural resources resulted into the concept of indigenization which has now been emphasized in the natural resource sector. Indigenization refers to the transfer of ownership and control of a sector from foreigners to the indigenes with the aim of reducing foreign dominance on the economy and ensure local participation. The implementation of indigenization as a policy has therefore become a priority in most of the resource-rich developing countries like Nigeria, Ghana and Algeria. Ever since the introduction of the petroleum downstream business in the country, the government of Ghana has been developing strategies, such as the LPG cylinder recirculation model (Bekoe & Enninful, 2022), to take advantage of the market in an attempt to facilitate development in the country.

INDIGENIZATION OF THE PETROLEUM DOWNSTREAM INDUSTRY IN GHANA

The Ghanaian petroleum downstream industry is witnessing an increase in participation by the locals and fully-owned Ghanaian businesses after several years of dominance by multinational companies. As of the third quarter of 2022, from a report by National Petroleum Authority (2022), it showed that the indigenous companies were in control of about 78 % of the total market share of petroleum products marketed and distributed, up from under 28 per cent in 2001 (Owusu 2014). The significant increase in the involvement of Ghanaian companies in the petroleum downstream sector over the years is evident in the number of licensed companies and the amount of products marketed and distributed by the indigenous companies. The significant increment in indigenization (that is the local participation by the indigenous companies) in the petroleum downstream sector can be credited to the National Petroleum Authority (NPA), an institution established by the Act of Parliament in 2005 (ACT 691), which promotes the local content initiatives. Not limited to only Section 12 of the NPA Act 691, the qualifications necessary for granting a person license for the purpose of engaging in the petroleum downstream business are spelt out as follows in the National Petroleum Authority Act (2005): It states that: 'a license under this act may only be granted to;

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- a) A citizen of Ghana; or
- b) A body corporate registered under the Companies Code, 1963 (Act 179); or
- c) A foreign individual or foreign company in a registered joint venture relationship with a citizen of Ghana or a Ghanaian company.'

This initiative by the government is as a result of lessons taken from the mining and forestry sectors where Ghanaians were eluded of their fiscal benefits (Akabzaa et al. 2007; Ayelazuno 2014b; Ayine 2001) causing the state to begin laying out policies to prevent the dutch disease. Background History on Ghana's Petroleum Downstream Industry.

Ghana's dependency on imported refined petroleum products distributed by the local levels of the multinational companies had been wholly even before the commencement of the operation on crude oil processing at Tema Oil Refinery (TOR). Then, oil companies such as Shell, Texaco, British Petroleum (BP), Mobil and Total completely filled the petroleum sector with the brand name "SHELL" epitomizing the sector. Indeed, the older generation of Ghanaians used to indirectly call every fuel retail station as "PETROL SHELL." (Owusu, 2014) Prior to and soon after Ghana's Independence in 1957, the petroleum downstream business system, that is the importation and sale of petroleum products, was dominated and monopolized by the multinational companies. Due to the lack of interference by the colonial government, the multinational oil companies were at liberty to set any price for their products which created inflation.

When Tema Oil Refinery (TOR,) a refinery commissioned in 1960, began its crude oil processing in 1963, the role of the multinational companies in the importation of petroleum products was curtailed. Accordingly, it was the local levels of multinational oil companies such as Shell, Mobil, Texaco and British Petroleum (BP) which were given the responsibility by the government to import the crude oil required by TOR for processing into finished products when the refinery began its operations.

Earlier before the establishment of the Energy Commission in 1997 by an Act of Parliament (Act 541) with the mandate to, among other things, grant licenses for the marketing and sale of petroleum products, the Ministry of Energy was in charge of granting such licenses. In those times, Ghana Oil Company Limited (GOIL) was the sole local Oil Marketing Company (OMC) out of the numerous multinational OMCs. However, ever since the inception of the Energy Commission through the setting up of the National Petroleum Tender Board in 2004 to the establishment of NPA, the petroleum downstream business system has gone through significant changes which has led to an increment in the participation of Ghanaian companies.

Current State of Ghana's Petroleum Downstream Industry

The sector continues to set significant milestones in the investment and expansion of petroleum product and facilities by Petroleum Service Providers (PSPs), which is now mostly dominated by a growing number of indigenous companies. This is evident when analyzing the total market

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share between the multinational (foreign) and indigenous companies in the Ghanaian petroleum sector over the years; that is prior to and after the setting up of NPA.

As of 2001 and 2016, the total market shares of the petroleum products marketed and distributed in the country by the indigenous companies was 28% and 45%, respectively (Owusu, 2014). The multinational companies made up the remaining 72% in 2001 and 55% in 2006. The latest data (the third quarter report of 2022) by NPA shows that the indigenous companies control about 78% of the total market share of petroleum products marketed and distributed in the country, a significant increase from previous years (National Petroleum Authority, 2022).

It is worth noting that, prior to the third quarter of 2022, the total market share controlled by the indigenous companies in the first quarter of that year was about 79% before its significant reduction to about 77%. This decline is in spite of the significant growth in the market shares of Ghana Oil Company Limited (GOIL) in that same period from 18.86% in first quarter to 20.92% in the third quarter (National Petroleum Authority, 2022) and the insurgence of some local OMCs mainly Zen Petroleum Limited and Star Oil Company Limited. Further detailed analysis identifies Vivo Energy Ghana Limited and Total Energies Marketing Ghana as one of the main factors for the reduction in the total market shares of the indigenous companies during this period when a look is taking into their total market shares combined; that is in the first quarter of 2022 the two multinational companies had a combined total market share of 16.44 to 18.48 in the second quarter and subsequently 17.84 in the third quarter.

Currently, the country has close to 65% local participation and equity in the petroleum downstream market with the foreigners still in charge of a sizeable share of about 35% (The Energy Year, 2021). Furthermore, there are about 170 OMCs, 42 LPG Marketing Companies (LPGMCs) and 37 Bulk Distributing Companies (BDCs); another petroleum service category NPA has made progress in, that supplement production from TOR through the importation, storage and distribution of finished petroleum products to meet the demand deficit. The presence of foreign companies in the BDC sector of activity is very low.

Impending Policy on the Indigenization of Ghana's Petroleum Downstream Industry

In 2021, the executives of NPA led by its Chief Executive, Dr. Mustapha Abdul-Hamid, announced their decision to reserve downstream petroleum marketing to indigenous companies - the most recent ongoing step in government's "oil nationalization agenda". That is, going forward, the importation of refined petroleum products into Ghana, and their distribution and sales within the country will be exclusively reserved for Ghanaian companies. This could mean that all OMCs and BDCs owned by foreign companies may be required to halt their activities in the country in the near future. This major step in the oil and gas downstream sector is as a result of plans initiated by the Government of Ghana in 2013 which led to the Petroleum (Local Content and Local Participation in Petroleum Activities) Regulations, 2013 (LI 2204) with the aim at developing local capacities in the petroleum industry's value chain for sustainable development (Ministry of Energy 2009), an initiative carried out in the upstream sector. Instructively, the success of the regulations in the upstream sector almost immediately

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persuaded the solid mining industry to commence self-regulation with regards to local content which is similarly proving successful (Goldstreet Business 2021).

This impending new policy is much more nationalistic than the initial ones which demanded that the OMCs and BDCs, in every Petroleum Agreement between Ghana and a foreign company, have at least 5% equity participation of the local companies. This requirement was no task for the foreign companies and additionally, the regulations opened the doors to new foreign investors into the Ghanaian market as long as they obtained the required level of local collaboration.

However, the new plan is to get the attention of foreign investors into the provision of key infrastructure such as refineries, storage facilities, pipelines and so on with the local partners having at least minority stakes.

In order to ensure a smoothly arranged process, implementation of the impending new policy will be done in stages in order not to affect any stakeholder or disrupt supply of refined petroleum products in the country.

METHODS AND MATERIALS

A thorough review of secondary data served as the main source of information for this paper. Literature on existing data from National Petroleum Authority and Ministry of Energy were reviewed together with articles, journals, newspapers and recognized websites were employed.

OPPORTUNITIES ASSOCIATED WITH THE INDIGENIZATION OF THE PETROLEUM DOWNSTREAM INDUSTRY

There are numerous benefits associated with this initiative such as creation of employment opportunities, development of local skills and technology, acceleration of industrial development, etc. therefore this section of the paper will be delving into the opportunities directly associated with this policy. These direct opportunities include:

i. Infrastructural Development

It is a fact that local investors lack anywhere near sufficient capacity in infrastructure but have more than enough capacity in the marketing and sales of petroleum products. A problem clearly identified by the Energy Commission in their Strategic National Energy Plan (SNEP) for the period 2006 - 2020. In their report, they acknowledged the lack of refinery capacity and the difficulty in attracting private capital into it. To resolve that, they called for the expansion of the total national refinery capacity which involves the expansion of TOR as well as the construction of new refineries (within the Export Processing Zone) in order to meet the nation's future petroleum requirements (Energy Commission, 2006). A problem that has seen no change as of now. With the implementation of this policy, foreign investors will be forced to focus on the provision of key infrastructures in the petroleum downstream sector due to the restriction on them in the marketing and sales of petroleum products.

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One such key infrastructure is the refinery. In Ghana, except for the drop in consumption of petroleum products in 2016 and 2017, the country's consumption rate has always followed an upward trend which is visible in the increasing demand for petroleum products by between 10-15% per year. The increase in demand requires an increase in supply which the country's refinery capacity has been lacking for several years now resulting in the importation of most of Ghana's petroleum product. This presents huge investment opportunities for foreign investors especially those multinational companies affected by the policy. The market is that huge considering that even if Ghana's only refinery, TOR with a design capacity of 45,000 barrels per day, began effective operations today, it will still not meet the country's consumption of about 4.64 million metric tons.

Others like storage facilities, pipelines and so on are other additional benefits the policy provides through the development of infrastructure.

ii. Reduction on Foreign Control of the Economy

In an interview with The Energy Year, Dr. Mustapha Abdul-Hamid, chief executive of NPA, talked about increasing the industry's share of Ghana's GDP from the current 6% to 8-10% as one of the long-term objectives of the NPA (The Energy Year, 2021). Surely, the implementation of this policy will be a massive booster in the attainment of this objective. According to the National Petroleum Authority (2022), as of the third quarter of 2022, the OMCs with the most (at least 5%) total market share in the country were GOIL (20.92%), Vivo Energy (9.37%), TotalEnergies (8.47%), Zen Petroleum (7.53%), Star Oil (6.19%) and Puma Energy (4.50% \approx 5%), out of which three are foreign companies (Total, Vivo and Puma); a representation of the high amount of total products distributed in the country as well as the huge amount of consumption in the country from these foreign companies. However, the data does not show the severity of the impact when you realize that most of the indigenous companies are located in the rural hinterlands in an effort to ensure that petroleum products are available everywhere in the country whilst the foreign players are mainly based and have the greater control in the urban areas where they reap the biggest profits leaving their counterparts with the smaller profits. This is a cause for concern since it indicates the equivalent large capital outflow from the country. The complete reservation of the downstream petroleum marketing to the indigenous companies will help completely retain capital in the country through reinvestment of profit in the country.

iii. Increase in Revenue

There will be a great impact in the development of the country knowing how much revenue will be gained from this policy. The total reservation of the downstream petroleum marketing for the local companies means the country will now gain the complete amount of revenue in the form of taxes from OMCs formerly under the multinationals. Also, the provision of infrastructural development by the foreign investors within the policy will greatly influence the revenue of the country as stated by Bräutigam (2002), "Foreign aid is often a major source of revenue for developing countries, and for some developing countries it's the primary source of revenue."

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iv. Ensures Indigenous Participation and Self-Reliance

The main aim and role of the policy is to ensure a greater involvement of the indigenes in the control, management and running of the petroleum downstream sector. Thus, the local participation will rise significantly from its current percentage of about 65. Additionally, the infrastructural development plan in the policy will eliminate the problem of dependence on imported petroleum products by ensuring self-reliance. As of now, most of the petroleum products used in the country are imported, putting pressure on the cedi's exchange rate resulting in the need for foreign aid to keep up with demands. The expansion of key infrastructures like TOR and the establishment of new infrastructures such as refineries and storage facilities will curb the country's dependence on these imported petroleum products whilst promoting independency.

DISCUSSION

This paper assesses fully the contributions indigenization of the petroleum downstream industry will have in the country's long term goal of developing and promoting local content and local participation in all facets of the oil and gas industry. An ambitious goal considering no country in the history of petroleum production, has ever achieved 90% local content. (Olsen, 2013).

Although the country will experience huge benefits from this initiative, there is the threat of discouraging current and future foreign investors. These foreign investors are the key to raising the initiative to a higher sealing considering the possible impact they will have in the infrastructural aspect of the petroleum downstream sector. Even with that, there will be the necessity for local partners to have at least a minority share. This poses the question of whether they can trust the Ghanaian government since they could encounter similar fate as it will happen in the marketing and sales of petroleum products in the petroleum downstream sector. Even though the new law will not go against World Trade Organization rules, which are in connection with merchandise trade instead of investment, it is a fact that it will stir up intense protestations from the foreign communities which more than anything destroys the image of the country in the international investment market. It is therefore necessary for the government to act on reassuring these foreign investors in the impending policy measures that will bring stability, transparency and the unlikeliness of these agreements changing. Also, there are two Nigerian OMCs (So Energy and African Petroleum) operating in Ghana which are protected by the ECOWAS Investment Policy; a policy purposed to create a single ECOWAS investment-and-trade space that ensures similar treatment of private investments in the West Africa region (ECOWIP, 2018). This may add up to the long list of disputes over Nigerian retail trading in the country. This issue, however, could be solved by exempting them from the initiative considering the insignificance of their market share in the marketing and sales of petroleum products in the downstream sector or putting in place certain demands such as siting a number OMCs in rural areas which either ways will still discourage them (Goldstreet Business 2021).

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One other major negative impact of this initiative will be the hijacking of the economy by the rich. In the attempt to limit foreigners control and domination of the economy, the initiative will open the doors for the very rich indigenes to take over the economy. Due to reservation of the downstream petroleum marketing and sales to the indigenes, multinational brand owners of OMCs will be forced to sell their franchise petrol stations to indigenes who are well positioned to pay some level of compensation to them and subsequently become full owners of those stations. This takeover can only be carried out by few wealthy indigenes in the country. What does this mean? It means that, if a wealthy indigene is able to own any or all or some of the big OMCs like Total Energies, Vivo Energy, Puma Energy, etc., the indigene is going to be having a massive control of downstream petroleum activities in the country and worst case scenario, if prior to the initiative being implemented, the individual already owned any of the significant OMCs currently in the system, that individual adding any of the big multinational OMCs will cause a serious impact in the petroleum downstream market, the lives of citizens and the economy as a whole. To control this, the government of Ghana through the state-owned OMC, GOIL, could seize ownership of 50% of the multinational retail outlets or government could place extra taxes on indigenes according to the total market shares of those multinational OMCs they are willing to own.

CONCLUSION

In a country where citizens are encouraged to invest and develop local businesses in the various sectors, the indigenization of the petroleum downstream will be a testament to the government's commitment to support the local investor. Despite the fact that this initiative will cause multinational companies to be discouraged from investing in the country and the wealthy indigenes to hijack the economy, measures such as policies to reassure foreign investors of the stability in their investment as well as government taking control over the foreign investments in the sector will help curb these adverse effects. This initiative, though pending, brings more benefits - through infrastructural development, reduction on foreign control of the economy, increase in revenue, indigenous participation and self-reliance - than harm on the country upon critical analysis.

REFERENCES

- Ackah, C. G., and Mohammed, A. S. (2020). 'Local Content Law and Practice: The Case of Ghana. In Mining for Change: Natural Resources and Industry in Africa, edited by John Page and Finn Tarp. Oxford University Press.
- Auty, R. M. (1993). Sustaining Development in Mineral Economies: The Resource Curse Thesis. London: Routledge.
- Akabzaa, T. M., J. S. Seyire, and K. Afriyie (2007). *The Glittering Facade: Effects of Mining Activities on Obuasi and its Surrounding Communities*. Accra: Third World Network Africa.
- Ayelazuno, J. (2014b). 'The "New Extractivism" in Ghana: A Critical Review of its Development Prospects'. *The Extractive Industries and Society*, 1(2): 292–302.

Vol.11, No.5, pp.58-67, 2023

Print ISSN: 2053-2199 (Print),

Online ISSN: 2053-2202(Online)

Website: https://www.eajournals.org/

Publication of the European Centre for Research Training and Development -UK

- Ayine, D. (2001). 'The Human Rights Dimensions to Corporate Mining in Ghana: The Case of Tarkwa District'. In *Mining, Development and Social Conflicts in Africa*. Accra: Third World Network Africa.
- Bekoe, M. A., and Enninful, A. N. (2022). *Ghana LPG Cylinder Recirculation Model: The Opportunities and Challenges*. International Journal of Innovative Science and Research Technology, 7(8). http://dx.doi.org/10.5281/zenodo.7085887
- Bräutigam, D. (2002). "Building Leviathan: Revenue, State Capacity and Governance". IDS Bulletin. Institute of Development Studies. 33 (3): 1–17. doi:10.1111/j.1759-5436.2002.tb00034.
- Energy Commission (2006). *Strategic National Energy Plan 2006 2020*. Energy Supply to The Economy. Annex III of IV.
- Goldstreet Business (2021). *The impending indigenization of Ghana's downstream oil and gas industry*.Goldstreet https://goldstreetbusiness.com/2021/editorial-features/the-impendingindigenization-of-ghanas-downstream-oil-and-gas-industry/
- Karl, T. L. (2007). Oil-Led Development: Social, Political, and Economic Consequences. Stanford, CA: Center on Democracy, Development, and The Rule of Law, Freeman Spogli Institute for International Studies, Stanford.
- Ministry of Energy (2009). 'Local Content and Local Participation in Petroleum Activities'. Policy Framework for Ghana. Accra: Ministry of Energy.
- National Petroleum Authority (2022). Petroleum Downstream Statistical Bulletin: FirstQuarterPublication,2022.Retrievedfrom:http://www.npa.gov.gh/Data/Documents/statistical-

bulletin/2022/Petroleum%20Downstream%20Statistical%20Bulletin%20for%201st% 20Quarter%202022.pdf

National Petroleum Authority (2022). Petroleum Downstream Statistical Bulletin: Second
Quarter Publication, 2022. Retrieved from:
http://www.npa.gov.gh/Data/Documents/statistical-

bulletin/2022/Petroleum%20Downstream%20Statistical%20Bulletin%20for%202nd% 20Quarter%202022.pdf

National Petroleum Authority (2022). Petroleum Downstream Statistical Bulletin: Third
Quarter Publication, 2022. Retrieved from:
http://www.npa.gov.gh/Data/Documents/statistical-

bulletin/2022/Petroleum%20Downstream%20Statistical%20Bulletin%20for%203rd% 20Quarter%202022.pdf

- National Petroleum Authority (2005). 'Act 691'. Retrieved from: https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/88533/101259/F1073404245/GH A88533.pdf
- Olsen, A. (2013). 'No Country Has Achieved 90% Local Content'. Offshore Ghana Magazine, 11: 20–1.
- Rosser, A. (2006). *The Political Economy of the Resource Curse: A Literature Survey*. IDS Working Paper 268. Brighton: Institute of Development Studies, University of Sussex.

Vol.11, No.5, pp.58-67, 2023

Print ISSN: 2053-2199 (Print),

Online ISSN: 2053-2202(Online)

Website: https://www.eajournals.org/

Publication of the European Centre for Research Training and Development -UK

Rostow, W. W. (1990). *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge: Cambridge University Press.

- Sachs, J. D., and A. Warner (1995). *Natural Resource Abundance and Economic Growth*. Cambridge, MA: National Bureau of Economic Research.
- The Energy Year (2021). *Ghana's dynamic downstraem sector*. https://theenergyyear.com/articles/ghanas-dynamic-downstream-sector/
- Owusu, B. S. (2014, March 26). Indigenization of Ghana's downstream petroleum industry: NPA makes progress. Graphic Online. https://www.graphic.com.gh/features/opinion/indigenisation-of-ghana-sdownstream-petroleum-industry-npa-makes-progress.html