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Petroleum Product Pricing, Deregulation and Subsidies in Ghana: Perspectives on Energy Security

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Abstract: *This paper reviews Ghana's recent experience with downstream petroleum products pricing and deregulation and looks at its implications for the nation's energy security needs. The Government of Ghana in June 2015 put in place a deregulation policy that had the expectation of allowing marketers and importers of petroleum products to sell directly to consumers by setting their own prices. The policy has the primary objective bring an end to government subsidies on the product which arises in from exchange rate losses and consumer subsidies. The study welcomes government's decision to revert to the competitive market forces using automatic price formulation as this removes implicit subsidization and its distortionary effects on the economy. With the advent of full deregulation, the burden of managing forex risks will shift from the government to the BDCs and TOR, and any such losses will become their prerogative. Petroleum subsidies, if any, should be redesigned and better targeted at the poor in the form of direct cash transfers as well as entrepreneurial skills training to improve their social and living conditions. Subsidies create distortionary effects and further exacerbate fiscal pressures as government has to borrow or tap into its reserves to offset price differentials.*

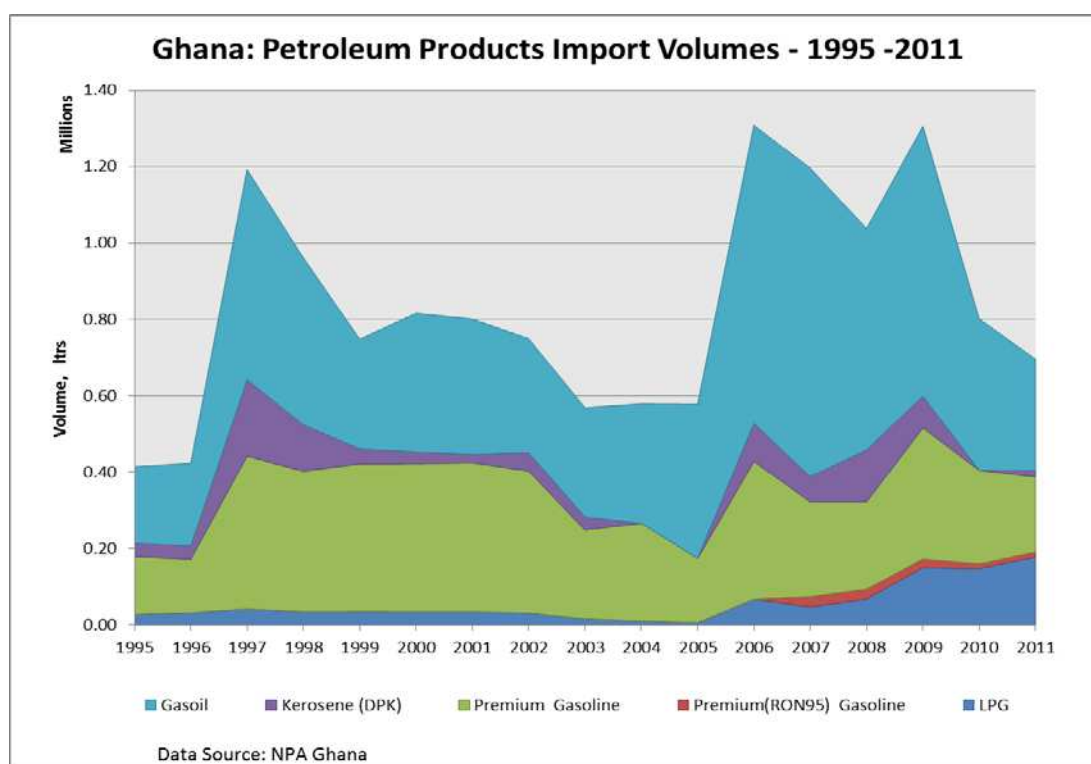
Keywords: Downstream Markets, Petroleum Products Pricing, Deregulation, Energy Security.

¹ Ghana Growth and Development Platform (GGDP) Working Paper. See: <http://ghanagdp.org/>

1 Introduction

The passage of the National Petroleum Authority Act, 2005 [Act 691] saw the establishment of the National Petroleum Authority (NPA) as the petroleum downstream industry regulator whose mandate is to regulate, oversee and monitor activities in the petroleum downstream industry; to establish a Unified Petroleum Price Fund (UPPF); and to provide for related purposes.² This came against the backdrop of a period of state controlled imports, distribution and pricing of petroleum products. As Ghana moves towards consolidating her middle-income status, energy security concerns and challenges will persist. Despite producing over 100,000 barrels of crude oil per day, the country depends on imports of crude oil (net importer) to meet its petroleum products requirement, which have grown at an exponential phase because of growth in the economy. Consequentially, the country is therefore subject to the vagaries of a volatile international market for crude and petroleum products.

Government's deregulation policy with the support of the IMF and World Bank post the completion of the debt relief package under the Heavily Indebted Poor Countries (HIPC) initiative, had the following objectives: (1) removal of restrictions on the establishment and operation of facilities; (2) removal of restrictions on the importation of crude oil and petroleum products and (3) removal of price controls. Despite the Authority and industry as a whole chalking some milestones³, the critical component of the 2005 regulatory reforms, which deals with full-scale deregulation through the application of a transparent automatic petroleum pricing formula for cost recovery, remains to be achieved to date.



² Section 2 of the of National Petroleum Authority Act, 2005 Act 491. See: http://npa.gov.gh/npa_new/downloads/npaAct_doc.pdf

³ Example such as putting in place the framework to licence Bulk Distribution Companies (BDCs) who foreword sell wholesale to the Oil Marketing Companies (OMCs)

The Government of Ghana states that its strategic policy focus for the petroleum downstream sub-sector is to “attract investments in order to expand the capacity of the existing infrastructure in the medium to long –term”⁴, of which the pillar is to deregulate and liberalise the operations in the sector to allow private sector participation in building and operating refineries as well as ancillary infrastructure such as depots. This will be achieved using a combination of administrative and regulatory changes anchored on a pricing framework that aims at full-cost recovery based on the following:

- i. *“Ex-refinery prices of petroleum products will continue to be based on import parity prices of petroleum products*
- ii. *Transportation and distribution charges for petroleum products will be regulated to ensure reasonable profit margins for transporters and distributors*
- iii. *Cross-subsidies between petroleum products will be applied, as necessary, to achieve specific national development objectives*
- iv. *Uniform national prices for petroleum products would be maintained.”*⁵

2 Petroleum Products Pricing Regime

Petroleum products imported into the country by the BDCs are regulated by the NPA with an objective of ensuring full cost recovery, government revenue generation and uniformity of prices through the through the Unified Petroleum Price Fund (UPPF). Full cost recovery within the value chain is based on the import parity pricing (IPP) benchmark. The IPP benchmark⁶ is the 'landed cost' of refined fuel to Ghana, which includes the international price for refined fuel brought in from Rotterdam for example (Freight on Board (FOB) Price), freight charges, exchange rate, customs and port duties, insurance and losses. It represents that the price that the BDCs (importers) would pay in case of actual import of product at the respective Ghanaian ports. The rationale behind the IPP benchmark is to have a strong relationship with the actual costs of fuel imports into Ghana taking into account global developments.

NPA employs a two-week inventory window (1st-16th of the month) whereby the two-week average of the FOB prices of the products is computed using a pricing reference such as Platts.⁷ The historical average exchange rate of cedi to the dollar within the two-week timeframe is then forwarded into the equation.⁸ Ancillary charges such as port duties are then added to arrive at the Ex-refinery price

⁴ Ghana’s Energy Policy, June 2009. Available: <http://www.energymin.gov.gh/wp-content/uploads/EC-Energypolicy-final-June-2009-FINAL.doc>

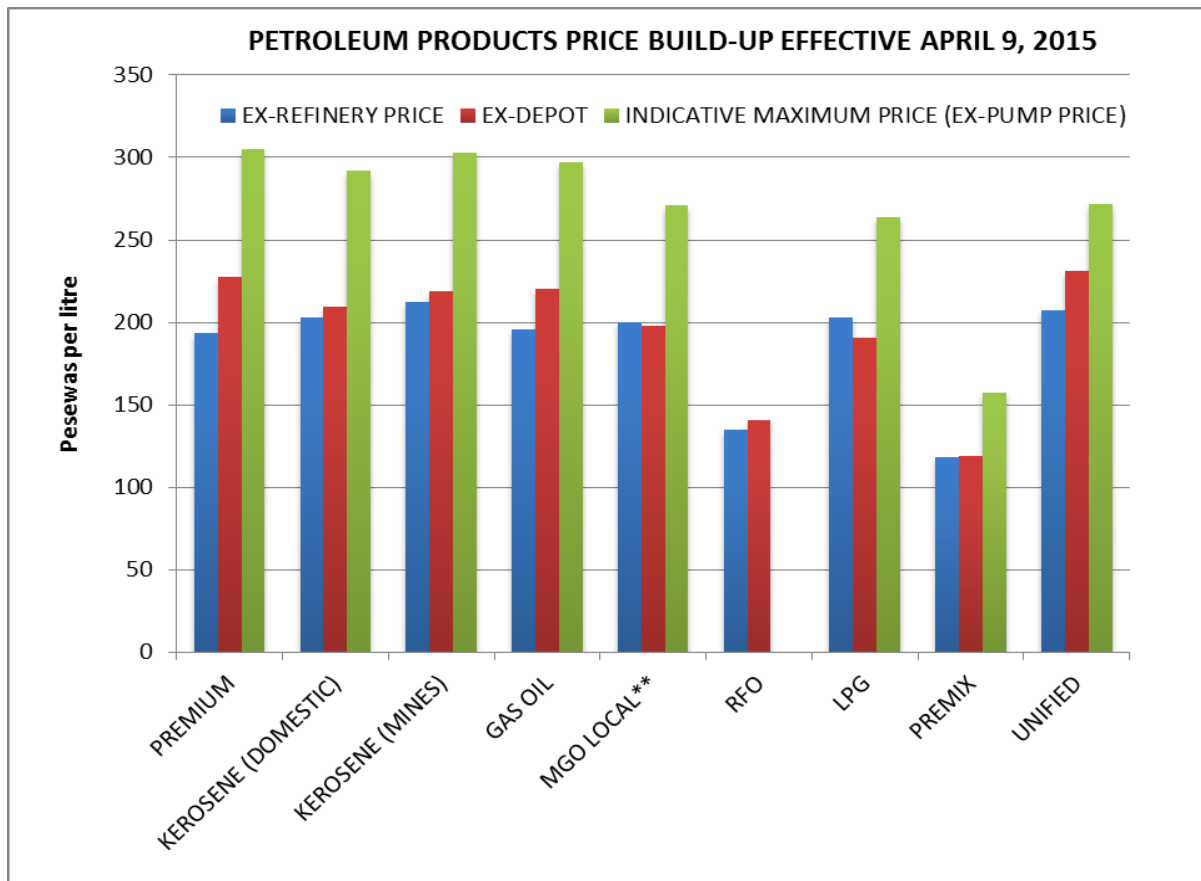
⁵ *ibid*

⁶ See: <http://www.slideshare.net/theoacheampong/breakdown-of-petroleum-pricing-in-ghana>

⁷ See <http://www.platts.com/IM.Platts.Content/MethodologyReferences/MethodologySpecs/Europe-africa-refined-products-methodology.pdf>

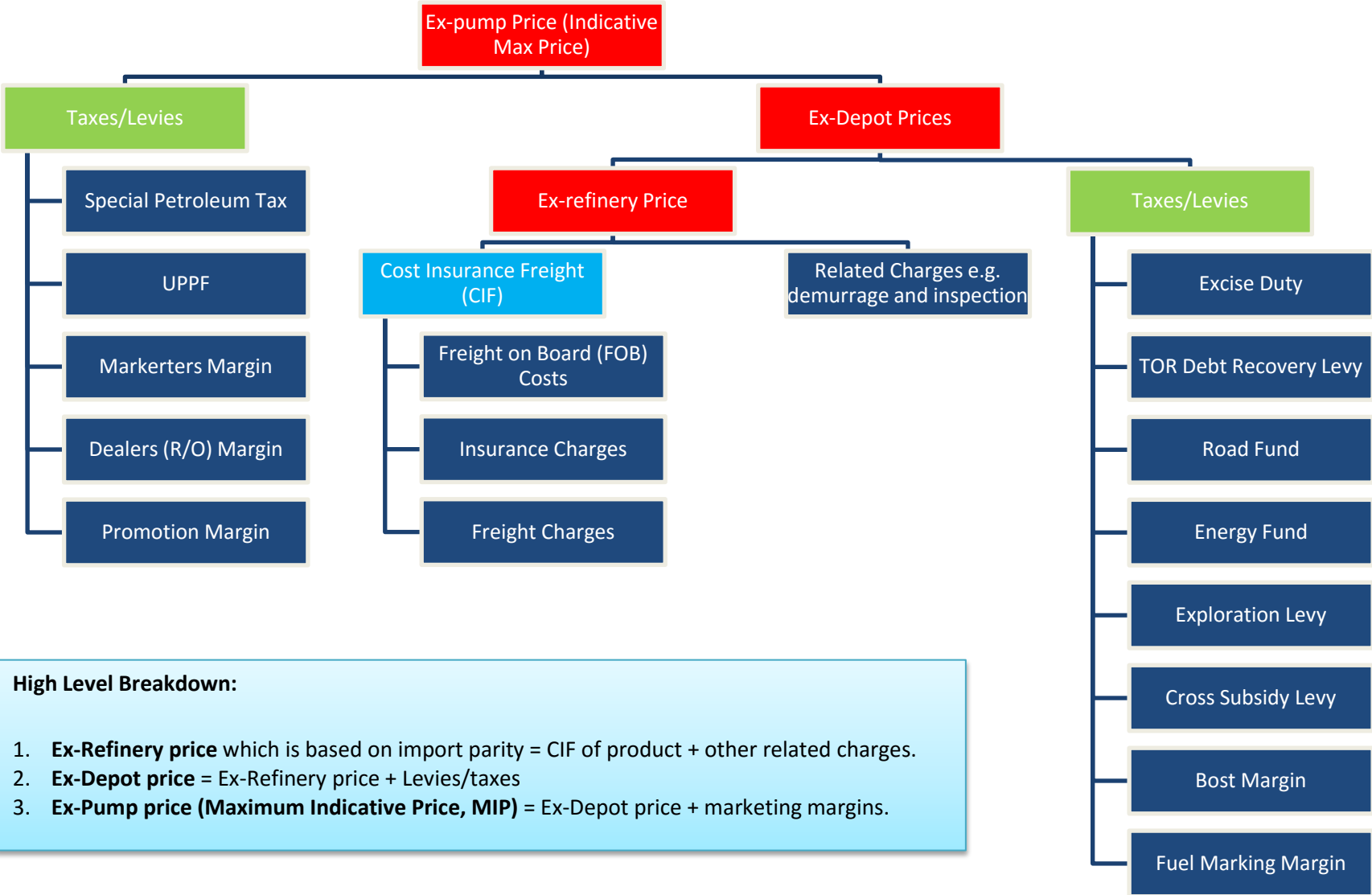
⁸ Provision has been made in recent times to allow forward trades in the exchange rate by the BDCs so as hedge their forex exposure.

calculated in Ghana pesewas per litre. Approved taxes and levies passed by Parliament are then added along with various OMC (distribution) margins to arrive at the final Ex-pump price, which is the price the public buys fuel at the various filling stations. Fuel taxes and margins typically make up about 35-40% of ex-pump fuel prices — see charts below for price build up.⁹



⁹ All Prices in Ghana Pesewas per Litre except LPG in GHp/kg. Data: NPA Ghana

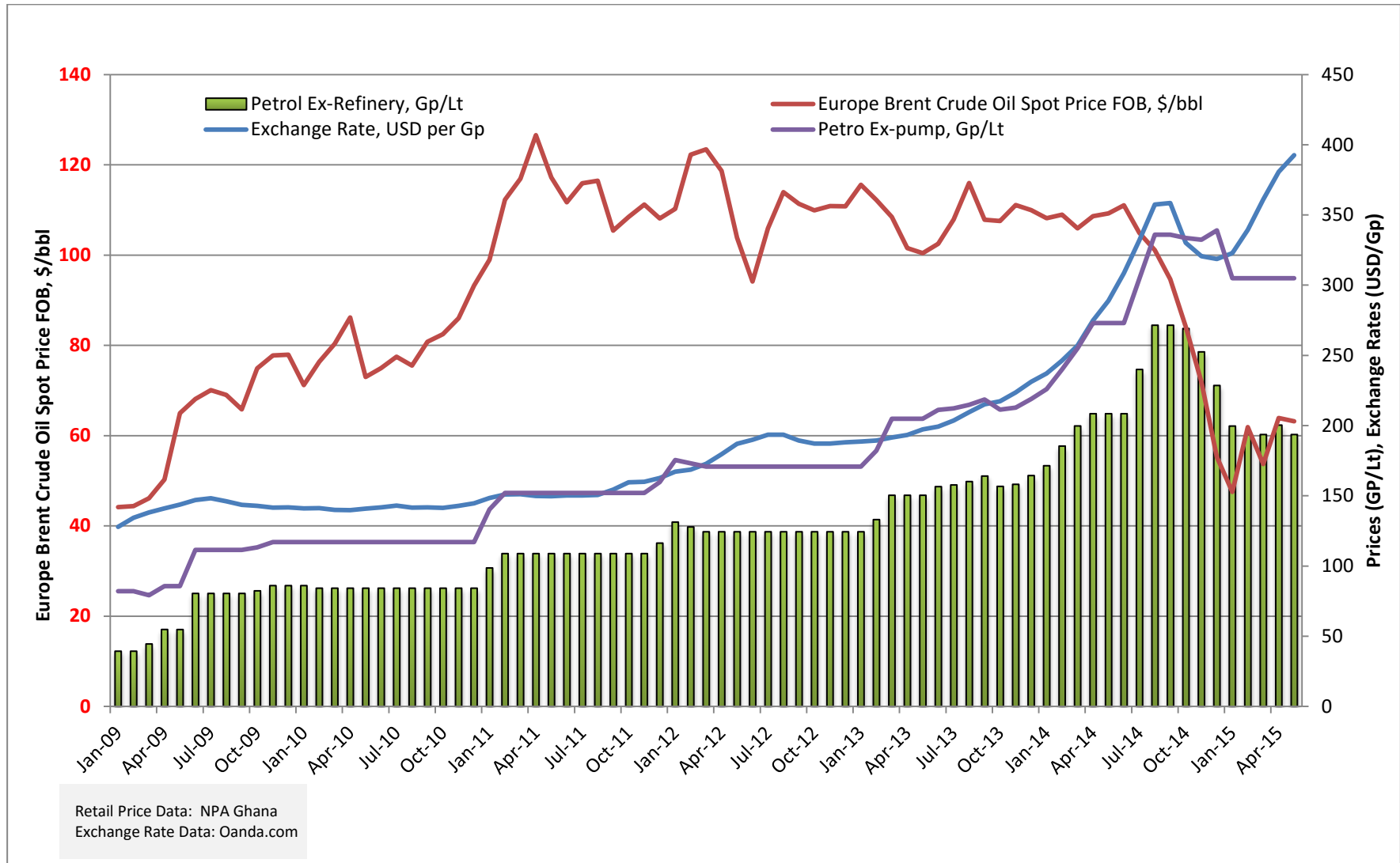
Figure 1 Breakdown of the Petroleum Pricing Regime in Ghana



High Level Breakdown:

1. **Ex-Refinery price** which is based on import parity = CIF of product + other related charges.
2. **Ex-Depot price** = Ex-Refinery price + Levies/taxes
3. **Ex-Pump price (Maximum Indicative Price, MIP)** = Ex-Depot price + marketing margins.

Figure 2 Petroleum Prices and Exchange Rates in Ghana



3 How Do Subsidies Arise?

The exclusive right of government through the NPA to intervene in the price build up implies that often the full cost of the product is not passed to consumers through the final ex-pump prices. The total taxes, levies, and surcharges are not included in the aforementioned setup. Consider this example: say a BDC lands petroleum products at the Tema port at an ex-refinery price of US\$1.3 million; however, government decides to cap the ex-pump price (ex-taxes and levies) at US\$1 million, then an under-recovery or subsidy component of US\$300,000 would have to be provided to the BDCs to reflect the cost of the landed product. This form of consumer subsidies arise when the prices paid by consumers, including both firms (intermediate consumption) and households (final consumption) are below a set benchmark price.¹⁰ These typically come in the form of pre-tax consumer subsidies that arise when prices consumers pay is below supply cost – supply cost is the international price adjusted for distribution and transportation costs.¹¹

Up until the recent announcement by the NPA to pursue the full-scale deregulation agenda¹², the regulator had been arguing for the removal of subsidies but was forced to kowtow to political pressure. To date, the public remains in the dark on the pricing formula vis-à-vis the amounts accrued due to cross-subsidization, TOR Recovery Levy, indirect and direct taxes, refinery margins and profits of the OMCs as well as the subsidy margins. As per our understanding, the cause of the brouhaha is the automatic adjustment formula, which has not been implemented to the latter. What prevails now is some sort of capping mechanism where the price adjustments on the global markets, which only constitute 65% of the price build up, do not automatically reflect in local prices taking into account the exchange rate movements and inflation to maintain parity.

The government does not import the refined products or crude oil but the BDCs are fully paid to cover the 65% component, which includes the additional monies spent in procuring the products to account for FX losses and inflationary pressures. So, the question that needs asking is: has government been partially subsidizing this 65% or reducing the other 35% tax component of the fuel price thereby calling it a subsidy? In essence, is this a post-tax subsidy? Generally, energy subsidies have wide-ranging economic consequences. As the IMF¹³ notes,

“While aimed at protecting consumers, subsidies aggravate fiscal imbalances, crowd-out priority public spending, and depress private investment, including in the energy sector. Subsidies also distort resource allocation by encouraging excessive energy consumption, artificially promoting capital-intensive industries, reducing incentives for investment in renewable energy, and accelerating the depletion of natural resources. Most subsidy benefits are captured by higher-

¹⁰ See <http://www.imf.org/external/np/fad/subsidies/>

¹¹ *ibid*

¹² See <http://pulse.com.gh/news/npa-strikes-again-petrol-price-deregulation-begins-today-id3869678.html>

¹³ See <http://www.imf.org/external/np/pp/eng/2013/012813.pdf>

income households, reinforcing inequality. Even future generations are affected through the damaging effects of increased energy consumption on global warming.”

The economic costs of subsidies can have dire consequences on the economy with resultant substantial loss of revenues and above average consumption patterns for petroleum products. In addition, it prevents investments in the supply and distribution infrastructures - including refineries – and does lead to smuggling and adulteration of products. There is no gainsay that in Ghana, most of the petroleum subsidies have often gone to benefit middle class consumption due to the poor nature of the policy design and implementation.

4 Tema Oil Refinery and Ghana’s Energy Security

Currently the majority (about 80%) of the finished products consumed in the country are imported by the BDCs from North West Europe using mainly Rotterdam spot prices with an element of hedging. Transportation charges, extra demurrage charges, insurance, etc., are added to the price build up before the cargo even berths at the Tema Harbour. Years of neglect created inadequate local refining and storage capacity. Poor management, under-recovery of costs and inadequate working capital culminated in the refinery becoming one of the heavily indebted parastatals in Ghana. This notwithstanding, the Tema Oil Refinery (TOR) has the potential to play a major strategic role in securing Ghana’s long-term energy security needs. The refinery has to be reorganised and its working structures revamped – it is in dire need of critical infrastructure upgrades.

Our proposal is for a corporate structure that sees an international strategic investor (partner) coming on board with a combination of debt and/or equity financing. We propose a 20-40-30 ownership mix whereby the Government of Ghana through GNPC or some special purpose investment vehicle acquires 20% of TOR’s shares; 40% floated on the Ghana Stock Exchange for ordinary Ghanaians and institutional investors (including the SSNIT, BDCs and OMCs) and the remaining 30% offered to the international strategic partner operating on a public-private partnership basis. The composition of the Board and management will reflect this new structure and will be incentivised to act in the best interests of the organisation with little government interference. The economics of petroleum products demand and supply in the sub-region justifies the need for TOR to consider expanding beyond the current 45,000 barrels per day to over 100,000 barrels per day capacity. Taking into account an 85% operating efficiency, the refinery operating at the current distillation capacity of 45,000 bbls/d should be able to process 38,250 bbls/d or 13.96 million barrels per annum of products. However, as Bukari (2013) notes:

“...TOR’s actual performance however has been far below this level with the highest point of production being 2004 where 11,228,000 barrels per annum were produced. This translates into an average daily production of 30,762 barrels. At this level of production, TOR’s

*utilisation rate was at 77%. The implication is that for all other periods TOR's level of capacity utilisation has been below this level, hitting the lowest level of 19% in 2009.*¹⁴

The refinery is configured to process light to medium grade crude feedstocks with an additional Residual Fluid Catalytic Cracker (RFCC) unit that expands its versatility and profitability by allowing heavier molecular fractions to be converted into short chain primary high-end products such as petrol and naphtha. The RFCC remains the 'cash cow' of any refinery. By virtue of TOR's configuration to process light crude feedstocks, the quality of the heavy fractions (bottoms) that determine the RFCC yields and product properties are high and thus of much economic value. Therefore, we should get more products per every barrel of crude oil, including the heavy fraction processed. The refinery economics (and margins), which is the difference between the wholesale value of the oil products TOR produces and the value of the crude oil from which they were refined taking into account efficiency factors, is such that the country stands to gain significantly from having a fully functional refinery. This comes in terms of jobs creation, availability of fuel and taxes paid to the treasury.

All oil refineries produce value-added petroleum products from crude oil feedstocks and profitability is a function of many different variables including:

- i. Feedstock costs (primarily crude oil)
- ii. Fuel costs and other operational costs
- iii. Regulatory Costs – e.g. complying with emissions regulations (particularly CO₂, NO_x and SO_x)
- iv. Market prices for the products produced – i.e. government set or market driven

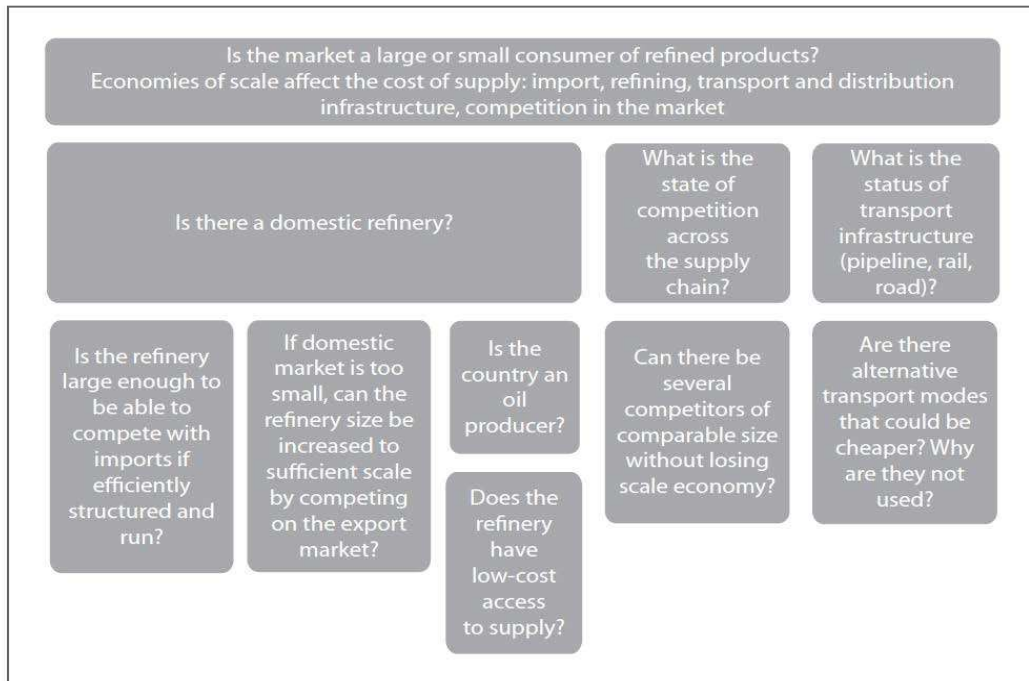
The economics are such that it is actually more prudent to import the raw crude blends from regional markets such as Nigeria, Equatorial Guinea, and Gabon for TOR to locally process. This can be negotiated through a bilateral agreement or paid at competitive international rates using standard Letters of Credit and other financial agreements, processed locally and then add profit margins to the finished products taking into account efficiency and import parity factors for both local and regional exports to landlocked countries like Burkina Faso, Mali and Niger. Businesses are primarily set up to achieve the primary objective of meeting demand or the availability of a market for the product or service being offered — profit maximisation objective. The petroleum demand trajectory in Ghana and the West African sub-region continues to enjoy steady growth with gasoline and diesel being the two most important products in demand. Oil consumption in West Africa was projected to rise to 665,000 bbls/d in 2013, driven by a considerable growth in demand for diesel, aviation fuel, LPG and gasoline.¹⁵ It is estimated that Nigeria

¹⁴ See http://www.dundee.ac.uk/cepmlp/gateway/files.php?file=cepmlp_car16_43_373109631.pdf

¹⁵ See <http://africanarguments.org/2013/05/10/africa%E2%80%99s-oil-and-gas-outlook-2013-part-1-%E2%80%93-by-rolake-akinkugbe-at-ecobank/>

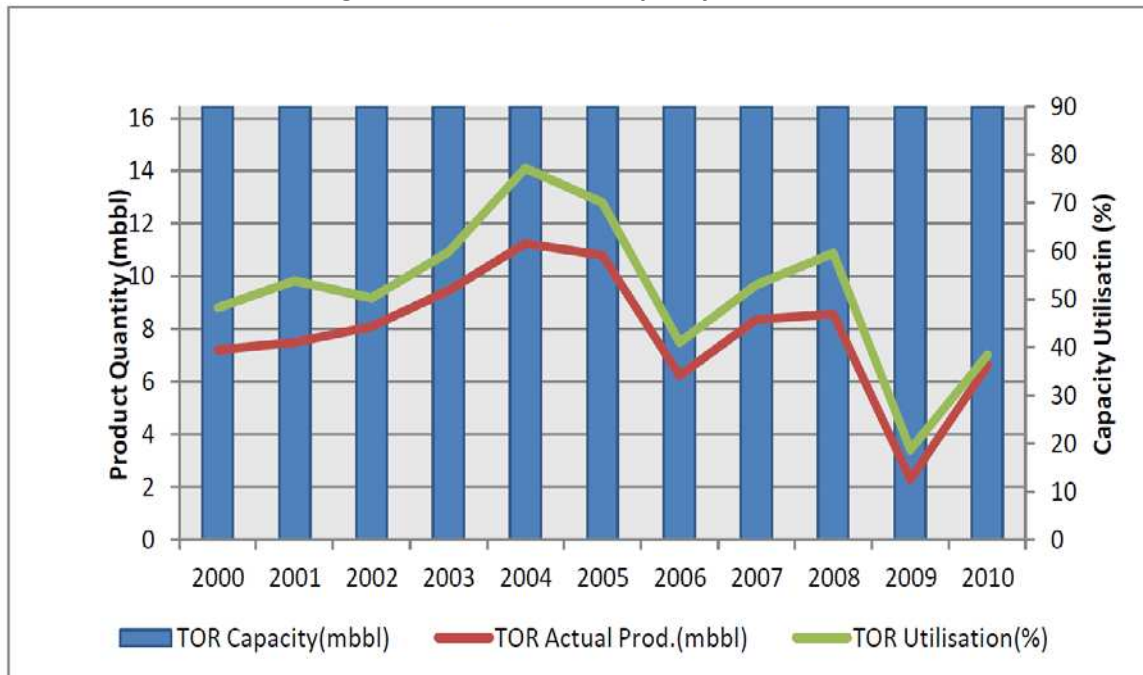
alone imports nearly \$7 billion worth of refined products annually, due to low capacity utilization of its refineries, which stood at less than 30% in 2012.

Figure 3 Impact of Market Size on Price Levels



Source: Kojima et al, 2010¹⁶

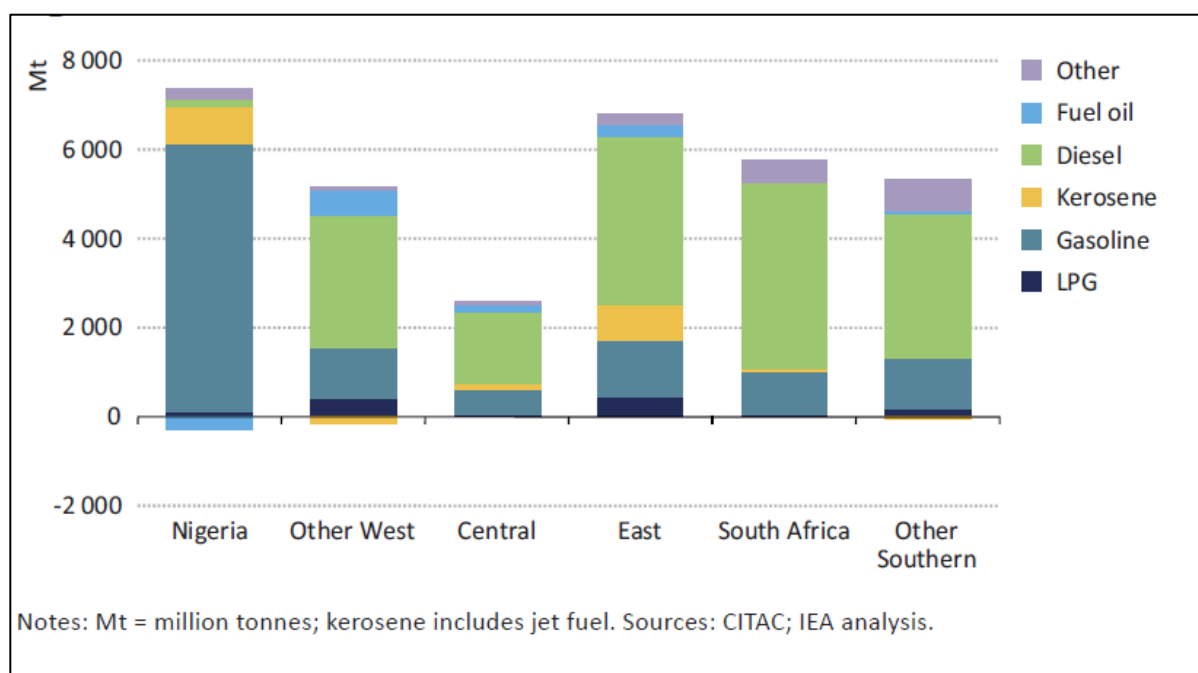
Figure 4 Trend of TOR's Capacity Utilisation



Source: Bukari, 2012

¹⁶ See Petroleum Markets in Sub-Saharan Africa - World Bank Report. http://siteresources.worldbank.org/INTOGMC/Resources/336099-1158588096604/eifd15_ssa_oil_markets.pdf

Figure 5 Oil Product Demand Growth By Sub-Region, 2000-2012¹⁷



5 Proposals for Reform and Concluding Thoughts

Prior until the recent announcements by the NPA to implement full deregulation, what persisted in the downstream sector was a pseudo-deregulated environment. Here, the regulator attempts to verify the import costs of the BDCs and by extension fixes the prices of end-user petroleum products taking into account subsequent taxes and levies. The policies of the NPA over the past years - and for that matter government - have contributed to distorting the market, which in turn has created a perverse set of incentives – adverse selection. This in turn has led to unnecessarily high prices at the pumps even when benchmark crude prices have fallen on the international market as well as the creation cartel-like oligopolies that have little incentive to invest in additional refinery and/or storage capacity. The petroleum pricing and subsidy regime in Ghana is poorly targeted. It has often gone to subsidize middle class consumption, the largest consumers of petroleum products through their ownership of vehicles, generating sets and other machinery. Petroleum subsidies should be redesigned and better targeted at the poor in the form of direct cash transfers as well as entrepreneurial skills training to improve their social and living conditions. Subsidies create distortionary effects and further exacerbate fiscal pressures as government has to borrow or tap into its reserves to offset price differentials. The cross-subsidy margin on kerosene and premix, so called social fuels, can be maintained. But these need to come directly from marginal levies other products like petrol and diesel that have relatively fixed inelastic demand patterns.

This notwithstanding and given the commencement of full scale deregulation, salaries and by extension minimum wage increments need to be commensurate with general price levels to account for

¹⁷ See IEA Africa Energy Outlook, 2014.

http://www.iea.org/publications/freepublications/publication/weo2014_africaenergyoutlook.pdf

the multiplier effect of this household on expenditures such as transportation and food. According the Ghana Living Standards Survey (GLSS6), the annual average household expenditure is GH¢9,317 with a mean annual per capita expenditure of GH¢3,117. On average, a person spends about GH¢8.85 per day of which food expenditure accounts 47% of total household expenditure whereas expenditure on housing (includes water, electricity and gas) accounts for 11.3% of total expenditure and 6.9% for transport. It will be important for government to take a second look at some taxes on ex-pump prices which are no more justified. For instance, the exploration levy is to be given to GNPC for their exploration activities. However, since the commercial production of oil, GNPC has been duly funded from Ghana's share of oil revenues. Another example is the TOR debt recovery levy. The removal or reduction of some of these levies/taxes will minimise the impact of oil price volatility on consumers. In addition, consumers should have access to information especially on pricing, to inform the buying decisions. NPA should build its capacity to publish daily or weekly or bi-weekly adjustments of petroleum prices. This will help promote competition.

Again, NPA should simplify the registration process of BDCs to allow investments into the sector. With the current number of 28 BDCs, there are fears for possible collusion among them. Since TOR is not operational, at least for now, any form of collusion can threaten Ghana's energy security and may lead to consumer exploitation. We also call on the government to expedite action on the ownership structure of TOR to make it operational. We foresee TOR as a market stabiliser especially in the medium to long run.

In conclusion, domestic petroleum product prices can be set by government or allow competitive market forces often using a pre-defined formula or an ad-hoc basis. It is welcome that government has decided to revert to the competitive market forces using automatic price formulation as this removes implicit subsidization and its distortionary effects on the economy. With the advent of full deregulation, the burden of managing forex risks will shift from the government to the BDCs and TOR, and any such losses will become their prerogative. In addition, giving the introduction of retail competition, the various OMCs will have the opportunity of negotiating different ex-refinery prices with the respective BDCs, which should ultimately enhance consumer welfare if done right. So long as prices for crude oil fluctuate on the world market, prices paid locally will vary from time to time. Given government's commitment to full-cost-pass-through pricing regime, it becomes imperative that policymakers know the demography of the people consuming the products — even within the middle class— and their elasticities of demand so appropriate interventionist policies can be implemented. A more detailed study of the consumption patterns of petroleum products between the rich, and between public and private sector institutions might yield some interesting results.

6 References

- Bukari, D. (2013). Why Do Refineries Perform So Poorly? The Case Of Ghana's Tema Oil Refinery (TOR). [online] Available at: <http://www.dundee.ac.uk/cepmlp/gateway/?news=32390> [Accessed 14 Aug. 2015].
- IMF, (2015). IMF and Reforming Energy Subsidies. [online] Available at: <http://www.imf.org/external/np/fad/subsidies/> [Accessed 14 Aug. 2015].
- Torneyi, E. (2015). NPA strikes again: Petrol price deregulation begins today. [online] Pulse.com.gh. Available at: <http://pulse.com.gh/news/npa-strikes-again-petrol-price-deregulation-begins-today-id3869678.html> [Accessed 14 Aug. 2015].
- IMF (2013). Energy Subsidy Reform: Lessons and Implications. [online] Available at: <http://www.imf.org/external/np/pp/eng/2013/012813.pdf> [Accessed 14 Aug. 2015].
- Ministry of Energy Ghana, (2009). Ghana's Energy Policy, June 2009. Available: <http://www.energymin.gov.gh/wp-content/uploads/EC-Energypolicy-final-June-2009-FINAL.doc>
- IEA (2014). Africa Energy Outlook 2014. [online] Available at: http://www.iea.org/publications/freepublications/publication/weo2014_africaenergyoutlook.pdf [Accessed 14 Aug. 2015].
- Akinkugbe, R. (2013). Africa's oil and gas outlook 2013 (Part 1). [online] Available at: <http://africanarguments.org/2013/05/10/africa%E2%80%99s-oil-and-gas-outlook-2013-part-1-%E2%80%93-by-rolake-akinkugbe-at-ecobank/> [Accessed 14 Aug. 2015].
- Kojima, M., Matthews, W. & Sexsmith, F. (2010). Petroleum product markets in Sub-Saharan Africa: Analysis and Assessment of 12 Countries. [online] Available at: http://siteresources.worldbank.org/INTOGMC/Resources/336099-1158588096604/eifd15_ssa_oil_markets.pdf [Accessed 14 Aug. 2015].