Africa Centre for Energy Policy

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# BEYOND THE 2016 ELECTIONS: ENERGY SECTOR PRIORITIES FOR THE NEXT GOVERNMENT OF GHANA

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GOGIG GHANA OIL AND GAS FOR INCLUSIVE GROWTH

# Contents

The development of Ghana hinges on the country's ability to supply adequate and reliable energy to the productive sectors of the economy. Over the last five years, power shortages have cost the economy in growth losses estimated at 2% of GDP. This has also affected the foundation required for an economic take-off, thereby weakening future prospects for accelerated economic growth. The oil and gas sector has also suffered production and revenue losses, as well as prolonged inactivity with potential for further slowing the growth of the oil industry. The 2016 general elections therefore provide an important bridge into the future as the next government, irrespective of which political party wins, will be faced with challenges as well as enormous potential for repositioning the energy sector as the engine of economic growth. This review is a cautionary note to the next government as it examines the variables that could shape the energy sector and the economy as a whole. We expect that guided by these comments, the energy sector challenges will be rigorously addressed in the short-to-medium term.

# 1.0. OIL AND GAS SECTOR

The oil and gas sector faced many challenges since the commencement of oil production in the Jubilee Fields. Oil production has not met planned output, whilst revenue from oil fell far below budget projections due to plummeting global oil prices, especially in 2015. In spite of the fast-track approach to oil production in Ghana, the development of the oil and gas industry has been slow leading to increased inactivity on oil blocks for most parts of 2014 to 2016 except a few appraisal works by Hess Corporation and the development of TEN and Sankofa projects. The contributions of the oil and gas sector to the economy has been on a decline from both production and revenue sides, which is now reflected in the declining growth of the economy.

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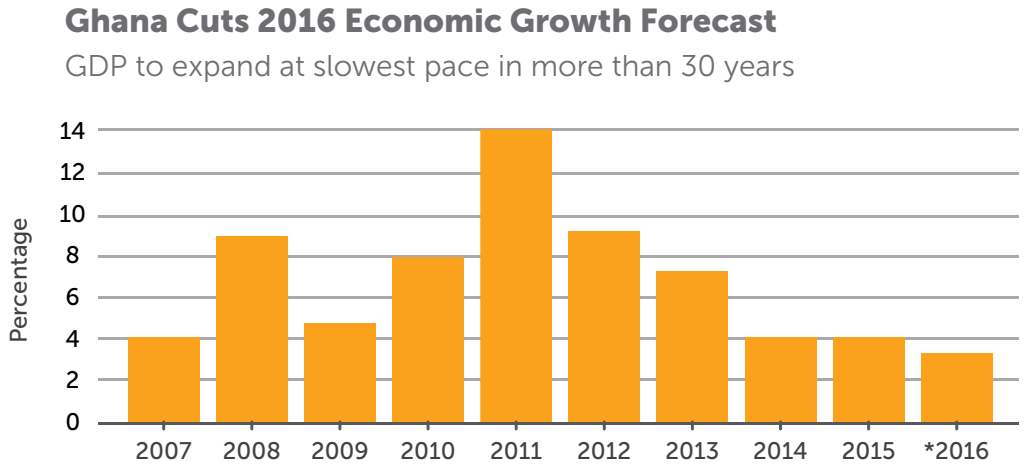
## 1.1. Oil and Economic Growth in 2016

Economic growth in 2016 slowed further than earlier projected by the government. Due to technical problems associated with the turret bearing of the FPSO Kwame Nkrumah, oil production declined amidst slumping oil prices which reduced revenue from Ghana's petroleum resources by more than 40% below expectations. In addition to this, gas supply from Jubilee has been interrupted twice – due to faulty gas compressor and the turret bearing problem. In November this year, domestic gas supply reduced to 40mmscfd from 90mmscfd, which also affected the production of natural gas liquids and LPG. The combined effects of these factors could be grave for economic growth (See graph below from Bloomberg ).




Source: World Bank, Ghana Statistical Service and Ghana Finance Ministry

* 2016 is new government forecast for GDP growth

## 1.2. Oil Outlook

The outlook for oil output is positive going into 2017 as oil production could increase to between 180,000 and 200,000 bpd by the last quarter of 2017. This will be realized due to the following:

i. The commencement of oil production in the TEN fields in 2016 and the plan to increase production to 60,000 bpd in 2017;

ii. The plan to permanently moor the FPSO Kwame Nkrumah, which is expected to commence in April for a period of 3 months, will ensure jubilee production recovers before the end of 2017;

iii. Sankofa - Gye Nayme fields will also start oil production in the first quarter of 2017 with about 45,000 bpd.

Based on existing fields and on-going field development works, crude oil production is estimated to reach 240,000 bpd by 2020, which will

make Ghana the fourth largest producer in Africa. However, the oil industry faces a serious setback if no new commercial discoveries are made. Beyond 2020, Ghana will not be able to increase production for 5 years or more, even if new discoveries are made between 2017 and 2020 considering that it takes an average period of 7 years between discovery and production . Also, the inactivity offshore which affects future production prospects can be attributed to the provisional ruling on the Ghana-Ivory Coast maritime dispute by the International Tribunal on the Law of the Seas (ITLOS), which has frozen exploration works in the disputed areas. Therefore, with the difficulty of replacing depleting reserves, the oil and gas industry faces medium term risks, which will be further aggravated if all the producing and development fields enter their natural decline phase by 2024.

Also, existing Petroleum Agreements face market and execution risks and some of the companies holding these agreements are already responding. For instance, UB Resources is reported to have requested for a renegotiation of the terms of its Offshore Cape Three Point Block Agreement, whilst Eco Atlantic has sold its interest in the Three Point West Deep Water Offshore Block to PetroGulf Ghana Limited, a locally held Ghanaian company, which held a 4.5% interest in the Block prior to the sale, and is expected to reimburse Eco Atlantic US$576,580 for past operating expenditures owed to the company on the Block. There are other companies holding Petroleum Agreements who are not complying with their work obligations. These developments reduce the attractiveness of Ghana's oil and gas industry and could have a compounding effect.

The next government must act fast to improve on the upstream investment climate to attract more experienced companies to ensure renewed activity and possible new discoveries to revive the oil industry. The passing of the Petroleum Act 2016 and the Income Tax Act 2015 will no doubt provide some regulatory certainty, and incentivize upstream investments.

The laws provide some incentives to investors including for instance a requirement for the extension of exploration periods and sub-periods, beyond the standard periods where necessary, the introduction of recognisance license likely to accelerate data acquisition urgently needed to derisk the oil basins, and the introduction of an open and competitive

public tender process for acquiring concession rights which now provides a levelled playing field for investors to openly compete for oil blocks.

There are however some disincentives as well in the new laws, but these can be addressed through regulations. The Petroleum Act in particular reduced the period of a Petroleum Agreement from 30 to 25 years, introduced new fiscal terms including bonuses and capital gain tax, and minimum rates for some of the fiscal terms have been set reducing the negotiation window. The Income Tax Act also provides for an exempt debt-equity ratio to 3:1 for oil and gas project financing, a rule which did not apply to the oil and gas sector. It is important to note however that these new provisions strengthens the position of the government to maximize revenue, but this could not be achieved without cost to the growth of Ghana's frontier status. With current levels of production against the huge untapped potential, Ghana remains a frontier area and its sudden shift from investment attraction to revenue maximization could hurt the oil industry. Balancing the two objectives through the use of progressive fiscal provisions could help neutralize any investment disincentives the law presents.

## 1.3. Natural Gas Outlook

On the whole, gas supply faces more uncertainty than oil. Gas supply from Jubilee is expected to shut down temporarily for the period April to July, 2017 to allow for the permanent mooring of the FPSO. This creates a gas shortage of 90mmscf daily, which could cause significant challenge to power generation. Government expects that TEN gas, expected in 2017 could substitute for the loss. However, gas supply of 50 mmscf per day from TEN cannot fully substitute for the loss from Jubilee gas, as a deficit of 40mmscf daily remains significant, given that gas from Nigeria has been suspended. This is due in part to the fact that non-associated gas from the Tweneboa reserve is expected between 1 to 2 years later.

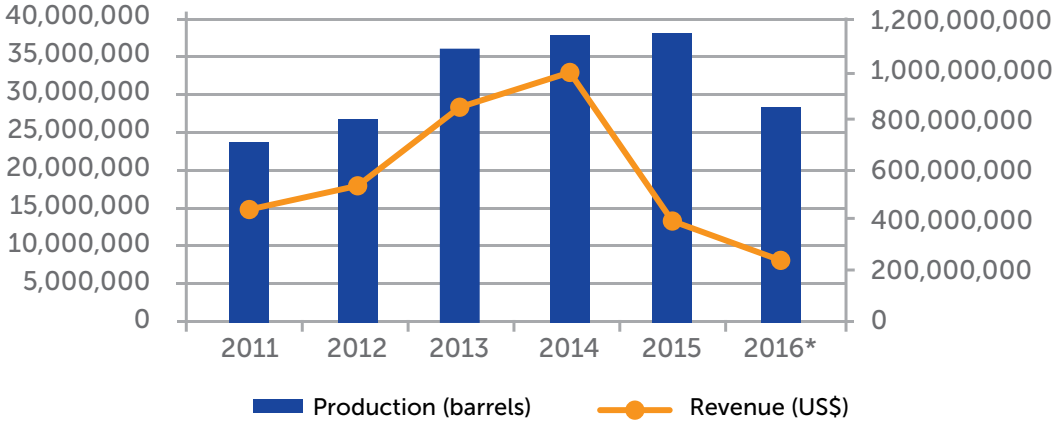
However, the outlook improves in 2018 when Sankofa-Gye Nyame gas is also expected to come on-stream with about 180mmscfd at peak, which could provide significant relief to meet gas demand for power production beyond 2017. It is however important for government to invest or attract investments into accelerated exploration to increase the potential for more indigenous gas supply, given that Jubilee gas and TEN gas will begin to decline from 2024. The alternative is to plan for future deployment of LNG facilities to complement indigenous gas supply.

We estimate that total daily indigenous gas supply will increase to about 360 - 400mmscf by 2018, significant to meet gas demand for power generation up to 2022. .We expect that increased indigenous gas supply will boost power production and the development of new industrial uses for gas. This will also generally decrease the cost of fuel input in power production although marginally since gas price particularly for Sankofa gas will be unreasonably high at $9.8/mmBtu delivered to Sanzuli.

## 1.4. Petroleum Revenue Outlook

The revenue outlook from oil and gas for 2017 is quite modest, as revenue mainly from TEN oil and gas production will substitute for revenue losses from the oil price crush. This may bring revenue from oil to the pre-2014 levels. Sankofa does not expect to generate significant amount of revenue for the government in 2017. Given that oil royalty from Sankofa is 7.5% and expected project revenue of US$81 – US$96 million based on crude oil price range of $42 - $50/bbl, government royalty could be an average US$7 million. No corporate taxes are expected for 5 years due to the fiscal package provided to the project by the government, and GNPC will not be entitled to its carried and participating interest (CAPI) in the first year. However, revenue from Sankofa will increase from 2018 resulting from increasing royalties and CAPI and mainly from gas sales.

Historical trend in petroleum revenue (US$)




Source: Reconciliation Report on Ghana Petroleum Holding Fund. (Various) and ACEP estimates

We note that in spite of the expected additional revenue from TEN and Sankofa over the next several years, Government must be cautious about its expectations and plans against this revenue for a number of reasons:

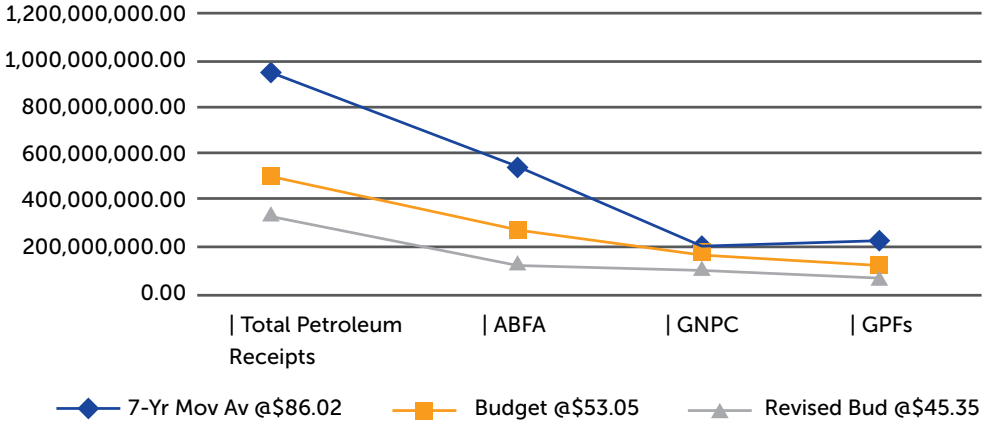
i. Jubilee revenue will reduce during the works for the permanent mooring of the FPSO between April and July;
ii. Crude oil prices may not recover significantly over the next few years;
iii. Sankofa oil will be in decline whilst gas production will be at plateau level by 2024;
iv. Addition to oil production beyond 2020 is based on new commercially viable discoveries which for now remains uncertain.

Government must therefore be prepared to spend the expected revenue efficiently and in high-impact projects. Revenue from oil and gas should be used as catalyst for transforming the economy through appropriate choice of investments (including agriculture, education and health), and achieve value for money.

However, the greatest threat to government revenue from oil and gas is the volatility in crude oil prices. Recent amendments to the Petroleum Revenue Management Act 2011 (Act 815) which sought to address the price effects in revenue projection, has rendered the formula for determining crude oil benchmark price ineffective, as it opens for multiple price benchmarks in one budget year, undermining the fiscal stabilization mechanism provided in the law. This was the case in the 2016 budget year.

Projecting crude oil prices for the budget has been the most erratic as the price was revised three times in the year from the statutory benchmark price of US$86.02pb to US$53.05pb used in the Budget estimates, to US$45.23pb used in the Supplementary Budget estimates. This accounted for revisions in projected revenue and the effect on the Annual Budget Funding Amount, the Ghana Petroleum Funds and the Ghana National Petroleum Corporation (GNPC) were predictable. The following graph presents the behaviour of the oil budget for the year.

**Figure 1: Effects of Price Volatility on Petroleum Revenue Projections**




Source: Reconciliation Report on Ghana Petroleum Holding Fund. (Various) and ACEP estimates

The effects of price movement have been felt further in the projected recurrent and capital budgets for the year. For instance, as a result of the revision in crude oil price benchmark for 2016 from US$53.05 to US$45.35, the proportion of ABFA in the total budget for goods and services declined from 12% to 9%, whilst ABFA in the capital budget declined from 30% to 20% (See Table below).

**Table 1: Effect of Crude Oil Price on Government Budget 2016**

| Oil Price | USD53.05per barrel | USD45.35per barrel |
|---|---|---|
| Total Goods and Services (GHS Million) | 2,536.80 | 2,126.90 |
| ABFA in Total Goods & Services (GHS Million) | 302.7 | 184.03 |
| ABFA in Total Goods & Services (%) | 12% | 9% |
| Domestic Financed capital (GHS Million) | 1,783.20 | 1,605.50 |
| ABFA in Total Domestic Financed Capital (GHS Million) | 529.73 | 322.07 |
| ABFA in Total Domestic Financed Capital (%) | 30% | 20% |

Source: 2016 Supplementary Budget

These developments continue to adversely affect the government budget in spite of the establishment of the Ghana Stabilization Fund by law to address crude oil price effects. The need to review the fiscal rule for projecting spending based on arbitrary price forecast as it is currently being done cannot be over-emphasized. Ghana needs a fiscal rule that is adjusted to cyclicality to reduce the discretionary effect of the Minister's adjustment of crude oil prices outside the statutory benchmark formula.

## 1.5. What the next Government should do:

1. **Build investor confidence in the oil and gas sector -** Review the investment potential of the oil and gas industry with the view to identifying the challenges of the industry and the constraints posed by the investment climate in Ghana. Government should conduct an international review of fiscal terms in countries with similar geological conditions and level of development of the oil industry to determine the optimal fiscal package as a way to positioning Ghana for huge investments upstream.

2. **Stop granting extensions to holders of Petroleum Agreements that are not meeting minimum work obligations -** Review the existing Petroleum Agreements with companies that are not meeting their minimum obligations and to encourage appropriate farm-in as a way to improving upstream activity. It is clear that proper due diligence on some of the companies were not effective. The need to develop strict guidelines on conducting due diligence on companies before they are allowed to bid for oil blocks is a necessary requirement to ensure the attraction of serious companies to the upstream oil industry.

3. **Develop implementing regulations for the new Petroleum Act -** Place the appropriate implementing regulations (legislative instruments) for the new Petroleum Act in Parliament. These regulations include data management, fiscal metering and health, safety and environment (HSE), which have already been drafted by the Petroleum Commission. In addition to these, government must develop regulations on price valuation, licensing of oil blocks and the management of the Public Register of Petroleum Agreements.

4. **Introduce a cyclically adjusted fiscal rule –** This ensures automatic stabilization of the oil budget based on projected crude oil price. This departs from the current practice that is subject to Ministerial discretion and which distorts the budget as well as undermine efforts at accumulating assets through the Ghana Petroleum Funds.

# 2.0. Power Sector

Between the year 2012 and now, the entire power sector value chain has been inundated with difficulties: ranging from supply deficit, inefficient distribution systems, unprecedented liquidity crisis, fuel supply challenges, and procurement challenges, etc. At the same time, recognisable attempts have been made to resolve the challenges.

## 2.1. Generation

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The year 2016 has been a better year compared to the period 2012-2015. There has been relative stability in the supply of power to the grid for most part of 2016 except for the periods during which the gas compressor broke down. This can be accounted for by additions to generation capacity in late 2015 from the following plants:

i. 220MW Kpone Thermal Power Project (KTPP);
ii. 110MW Tico Expansion Project;
iii. 225MW Karpowership which is an IPP project;
iv. 250MW Ameri Project in Takoradi, under Build Own Operate and Transfer (B.O.O.T)

These power plants provided great relief to the distressed supply side of the power sector although at a huge cost to consumers as electricity tariffs increased by more than 60%. However, they were not enough to guarantee consistent supply to the grid. Fortunately, supply from Ivory Coast at an average 150MW has provided an important buffer throughout the year. This enabled Ghana to meet the suppressed demand with aggregate supply of about 1800MW. This meant that there is no reserve margin to smoothen shortfalls arising from plant breakdowns, which makes the supply situation too fragile for comfort. The import of power from Ivory Coast also implies that we are not out of the woods yet as domestic sources are still limited, with Akosombo Hydro Dam still under a conservation progamme.

## 2.2. Power supply Outlook

The outlook for 2017 is hinged on a number of factors including financial and fuel supply challenges which are also very much linked.

### 2.2.1. Fuel Supply Security

The danger the power sector faces in 2017 is potential disruption in gas supply. Fuel supply insecurity contributed greatly to the instability of power supply during the power crisis and is likely to continue in 2017. The insecurity has been heightened by low supply of hydropower due to low levels of water in Akosombo and the Kpong retrofitting project. Water levels in the dam for a long time were below the minimum levels of 234 feet. Current levels however show an improvement to about 253.05 feet. Considering the extent at which the dam has been over-drafted over the last 5 years, and the coming dry season in the North, we are of the view that Government has taken the right decision to conserve the dam. This is why fuel supply has become more challenging, as thermal generation will continue to dominate the sector.

Fuel supply outlook is affected by two main challenges:

First, the suspension of gas supply from Nigeria due to Ghana's indebtedness to the West African Gas Pipeline Company (WAPCO) and NGas has for some time now put Asogli out of operation. Second, the temporary solution to moor the FPSO Kwame Nkrumah following the problems with the turret bearing, accounted for reduction in indigenous gas supply from 90mmscfd to 50mmmscf.

The 2017 outlook therefore faces uncertainty due to the decision to permanently moor the FPSO, which will lead to suspension of oil and gas supply from the Jubilee fields for three months starting from April 2016. This threatens power supply from Ameri and Aboadzi power plants.

Government has promised to substitute jubilee gas with TEN gas, but at 50mmscfd, gas from TEN will not be enough to completely substitute for jubilee gas as most of the non-associated gas in the TEN project is found in the Tweneboa reserve which is expected on stream more than a year from now. Therefore, a shortage of 40mmscfd of gas requires that some of the plants are run on light crude oil particularly the duel fuel Aboadzi thermal plants.

Also, the erratic nature of gas supply puts VRA's plants in danger since fuel switching affects the machines. The solution in our view is for VRA to dedicate some plants to use light crude oil constantly until gas supply can be regular.

At the moment, there is enough fuel stock for an average of 28 days; but whether this is sustainable or not depends on VRA's ability to generate funds to procure fuel. This raises the second challenge – financial security.

It is important to note however that Sankofa-Gye Nyame non-associated gas is expected on stream in 2018. In addition, Parliament recently approved a deal with West Africa Gas Limited to build a Regasification Plant to facilitate import of liquefied natural gas (LNG). These projects have positive prospects for the power sector in the medium term.

## 2.2.2. Financial Challenges

The poor management of the sector over the years resulted in a crippling debt levels, which contributed to the protraction of the energy crisis. The greatest problem confronting the utility companies today is the financial crisis that is gradually swallowing them especially VRA. The International Monetary Fund estimates that the total debt owed by the sector agencies - VRA, ECG and GRIDCO amounts to GHS16billion. This has eroded the credit worthiness of the companies, straining their relationships with the banks for operation and investment.

To address this challenge, a number of measures have been introduced including a restructuring programme for the debts owed Ghanaian Banks; and the introduction of the Energy Sector Levies, which are being used to service part of the debts. In spite of these efforts, the financial exposure of the companies remain significant particularly fuel related debts owed to NGas, Ghana Gas Company and WAPCO which currently stand at almost US$500 million.

We can predict that the financial challenges of the utilities will not be addressed over the next 2 to 5 years as VRA's cash flows have been taken over by Central Government through an escrow for direct procurement of fuel and other related payments. Cost of maintenance of the plants as well as payment of its short-term debts continues to expand its financial burden and increases its financial exposure. We understand why government has prioritized the payment of debts owed to Ghanaian Banks

considering the huge toll the debts have on the banking sector. This is not without cost. There is a window for government to also consider the payment of debts owed to NGas and WAPCO for immediate resumption of gas supply to enable Asogli come back to production. The cost of keeping Asogli redundant, paying capacity charges, is too high on the sector.

## 2.3. Electricity Demand Growth

The demand projections for the country have been so unreliable. According to the Energy Commission, Ghana's actual peak load and the total system peak on the grid transmission system in 2014 were 1,970 MW and 2,061 MW respectively. With an estimated growth of between 10% and 12% the total peak load for 2016 should have been about 2,400MW on the average. On the contrary, the system peak for the third quarter of 2016 averages 1,700MW. This is unrealistic and defies logic as consumption could not possibly decline by such a huge margin of 700MW.

The indication is that demand has been suppressed by:

1. **Load shedding -** The long period of load shedding hampered industrial growth and pushed many businesses out of operation particularly small and medium scale businesses according to a report issued by ISSER in 2014.
2. **High Tariffs -** the high electricity tariffs has also contributed to suppression of demand. The average tariff for domestic consumers today is 19 cents/kwh and that of industrial average is 50 Cents/kwh. This has affected economic growth projections for 2016.

Therefore, the current level of demand for power is not the economy's realistic level as demand has been suppressed and could be released when the economy and businesses recover. Also, in 2017, depending on the industrial policies the government intends to roll out and the incentives for growing the manufacturing and construction sub-sectors, demand for electricity will increase. In addition, successful and peaceful elections in 2016 will boost the confidence of investors in the Ghanaian economy. The IMF programme with Ghana, which will be ending in 2017 is expected to increase Ghana's

policy credibility and could further increase foreign direct investments. We expect these developments to significantly impact on demand for electricity.

The urgency to meet the increased demand cannot be over-emphasized. We understand that CENPower project which is expected to add 350MW will be delivered in 2017. However, we doubt its effectiveness in helping meet demand growth in 2017 given the expected completion time of September 2017. As at April 2016, the project was 42% complete. Government has also promised that the second KarPower Barge is ready to be deployed but the timing has not yet been confirmed.

## 2.4. What the next Government should do:

The plethora of problems confronting the power sector needs urgent and strategic political solution to steer the sector onto the path of sustainability. To a large extent, politics have contributed to the woes of the sector. Wrong decisions and interference in the operations of the agencies demolished the accountability structures in the sector, which has led to the current state of affairs. The way out is also another political decision to recreate a new governance regime for the sector, attract more investments and to position the utilities as financially viable companies.

The next government will need to focus on the following areas:

1. **Financial viability of Utilities –** Addressing the financial challenges of the utilities must be in earnest. Government should formally hand over its power plants to VRA to boost its asset base, expand the debt-restructuring programme to absorb some of the debts, and inject direct capital into the companies. The Energy Sector Levy is an important intervention, but can serve its purpose if it is ring-fenced to liquidate the energy sector debt.

2. **Fuel Security -** Government need to carefully examine the fuel supply constraints and fashion out the appropriate solutions to ensure consistent supply of fuel to the power plants. This also requires support to the utilities to become

financially sustaining companies capable of meeting their fuel cost. VRA should also dedicate some of its dual-fuel plants to run on light crude oil constantly until gas supply is regularized to address the impact of fuel switching on the equipment. Further, the Gas Master Plan, which has been approved by government, must be reviewed to cover alternative sources of imported gas (including LNG) in the light of limited indigenous gas potential in the medium to long-term.

3. **Review of existing Power Purchase Agreements** – Government must review its commitments with companies holding Power Purchase Agreements with ECG and pull out of those that have not yet secured funds to commence projects. This reduces government liability and frees it up to engage more serious companies.

4. **Generation Additions through Competition -** the practice of sole sourcing of generation additions has not been helpful in getting value for money. The implications have been the rising cost of generation through poorly negotiated contracts, which demands higher tariffs. The government need to ensure that needed capacity is sourced through competitive tendering.

5. **Conversion of Emergency Power Agreements to regular IPP projects -** all emergency power contracts that have failed to deliver on time will have to be canceled or renegotiated into a regular IPP to save on cost. The high tariffs associated with the emergency plants are not appropriate for long term economic planning and protection of industries. The conversion of the Early Power Project from an emergency to a regular IPP project is a clear example of how government can reduce high cost of procurement of new capacity.

6. **Operational independence of Sector Agencies-** the government should grant autonomy to state institutions in the sector to have control over generation planning and remain accountable to the sector ministry. The Ministry of Power should not continue to control procurement of new generation plants but should provide guidelines for such procurements by VRA to achieve value for money. This is to create the needed checks and balances and ensure efficiency in the planning processes.

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