Republic of Ghana

ENERGY SECTOR RECOVERY PROGRAM

Prepared by: Ministry of Energy

DATED: MAY 7, 2019

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DISCLAIMERS:

This document has been modified from the "Final Version" approved by Cabinet in May 2019 to remove Confidential Information related to specific contracts and/or commercially sensitive information which would not be appropriate to place in the public domain. Further, while some information has been updated to reflect changes which have occurred since the adoption of the ESRP by Cabinet in May 2019, it does not address all recent events that have transpired in the sector. The document also includes minor edits to correct language and improve clarity. The ESTF has strived to maintain a complete and comprehensive document similar in all material respects to the Cabinet approved version for public review.

Material Changes:

- General – Disclaimer was added
- Section 7.3 – Updated to clarify scope of PPA Review Committee reports and recent events with respect to PPA restructuring discussions with IPPs.
- Sections 6.3;7; 10.2.5, 10.2.6, 10.2.13 – Updated to account recent termination of ECG concession
- Section 10.2.20 – Moved CWM action to Phase II to take urgent action after termination of ECG concession
- Section 10.2.21 – Inclusion of GRIDCO improvement action to support overall sector recovery
- Section 12 – Sensitivity analyses which were no longer relevant post approval were deleted for clarity.
- Section 13 –Updated to reflect recommended changes to the suggested organizational structure to implement the ESRP during Cabinet deliberations, specifically to elevate the ESTF to a ministerial level working group.

The contents of this document include qualitative comments and hence provide a subjective assessment of the current energy sector in Ghana. The analysis and recommendations are based on assumptions and projections, which are subject to change. No representation or warranty, express or implied, is made as to the accuracy or completeness of the information contained herein. The Government of Ghana (GOG) or any of its representatives expressly disclaims any liability based, in whole or in part, on such information, errors there in or omissions there from. Any opinion or recommendation expressed in this document is subject to change without notice. The GOG is under no obligation to update or keep current the information contained herein.

1. DEFINITIONS AND INTERPRETATION

Whenever the following terms appear in this ESRP or the Appendices hereto, whether in the singular or in the plural, present, future or past tense, they shall have the meanings stated below unless the context otherwise requires:

AAF	Automatic Adjustment Formula as described in Section 6.3.6.
Action Item(s)	The key reform action item(s) described in Section 10 of this ESRP.
Annual Sector Shortfall	In any calendar year the sum of the difference between the revenue and costs in the power and gas sectors.
BAU or Business-As-Usual	Business-as-Usual base case used in the Financial Model using the assumptions set out in Section 8 below.
BPA	Bui Power Authority
BSA	Bulk Supply Agreement concluded between ECG and a private sector concessionaire.
BOST	Bulk Oil Storage and Transport Company
Concession Agreements	Means the BSA, LAA, and Government Consent and Support Agreement, between ECG and a private sector concessionaire.
Cumulative Sector Shortfall	The sum of the annual sector shortfalls between January 2019 and December 2023.
EC	Energy Commission
ECG	Electricity Company of Ghana Limited
ECG/PSP	The resulting Concession of ECG to a private sector partner.

EMT	Economic Management Team
ESLA Bond	Two series of Government bonds totalling GHS 5.66 billion in 2017 and 2018, which were securitized by a portion of ESLA tax revenue.
ESRP or this Document	The Energy Sector Recovery Program as compiled by the ESRP Working Group.
ESRP Approval Date	The date on which the ESRP is officially approved and adopted by Cabinet.
ESRP Timeline	The period commencing on the ESRP Approval Date until 31 December 2023.
ESRP Working Group	The ESRP working group comprised of representatives from the Office of the Vice President, MoEn, MOF, EC, GNPC, PURC, and representatives from PATRP. The Chair of the Working Group is the Executive Secretary of the Energy Commission.
ESTF	The Energy Sector Task Force to be established in accordance with Section 13 by the MoEn following the ESRP Approval Date.
Financial Viability	Has the meaning ascribed thereto in Section 4
Financial Model	Means the Financial Model prepared by the ESRP Working Group as updated from time to time.
GDP	Gross Domestic Product
GESTIP	World Bank-financed Ghana Energy Sector Transformation Initiative Project
Ghana	The Republic of Ghana
GNGC	Ghana National Gas Company

GNPC	Ghana National Petroleum Corporation
Government	Government of Ghana
Cabinet	The Executive Branch of Government
GRIDCo	Ghana Grid Company Ltd
GWh	Giga Watt Hours
IPP	Independent Power Producers
IPSMP	Integrated Power Sector Master Plan, as updated from time to time
KPI(s)	The Key Performance Indicators as defined in the BSA
kW	Kilowatt
kWh	Kilowatt hour
LAA	The Lease and Assignment Agreement means the agreement governing the relationship between ECG and a private sector entity as the concessionaire with regards to the ECG distribution system.
LNG	Liquefied Natural Gas
MDAs	Ministries, Departments, and Agencies
MoEn	Ministry of Energy
MOF	Ministry of Finance
MW	Megawatt
Office of the Vice President	The Office of the Vice President of Ghana

PATRP	USAID's Power Africa Transactions and Reforms Program
Portfolio PPAs	PPAs assigned by ECG to a private sector concessionaire to be updated from time to time.
PPA	Power Purchase Agreement
PPA Review Committee	Has the meaning ascribed thereto in Section 7.2
PSP	Private Sector Participation
PFM Act	Public Financial Management Act, 2016 (Act 921)
PURC	Public Utilities Regulatory Commission
Restructured ECG	The legacy ECG entity remaining after the finalization of the ECG PSP process and effective date of the Concession Agreements (including the BSA, LAA, and Government Consent and Support Agreement).
SIGA	State Interests and Governance Authority
Sector Arrears	The balance of cumulative net sector arrears as at 31 December 2018.
Sector Stabilization Payments	Payments by the Government, excluding any revenues generated through a tariff increase, required to clear the Annual Sector Shortfall.
SNEP	The Strategic National Energy Plan 2006 – 2020 for Ghana issued by the Energy Commission.
SOE	State Owned Enterprise
TTIP	Takoradi-Tema Interconnection Project

USAID	United States Agency for International Development
USD or $ or Dollars	The lawful currency of the United States of America
VRA	Volta River Authority

In this ESRP, unless the context otherwise requires:

1.1 terms not herein defined shall have the meanings ordinarily ascribed thereto in the Oxford English Dictionary;

1.1.1 references to any document (including this ESRP Document) are references to that document as amended, consolidated, supplemented, novated or replaced from time to time, and to all annexes, schedules, attachments, supplements and the like which form part thereof;

1.1.2 where this ESRP defines a word or expression, related words and expressions have a consistent meaning;

1.1.3 all periods of time and dates shall be based on and computed according to the Gregorian calendar and times of day are times of the day in Ghana;

1.1.4 in the computation of periods of time from a specified day to a later specified day, from means from and including and until or to means to and including;

1.1.5 references to any Section, paragraph, part, Appendix or recital are to those contained in or appended to this ESRP Document; and

1.1.6 the table of contents, section and appendix headings are inserted for convenience only and shall not affect the interpretation or construction of this Document.

2. EXECUTIVE SUMMARY

Ghana's energy sector as it exists now is not financially sustainable. As of January 2019, USD 2,748 million of net Sector Arrears are outstanding within the energy and gas sectors. If no action is taken, it is forecast that an additional USD 1,268 million will be added to this deficit in 2019 and net arrears will grow to more than USD 12,524 million by the end of 2023. Urgent action must be taken by Government to improve the financial condition of the sector, so that the citizens of Ghana may continue to benefit from affordable, reliable electricity and gas supply services for Ghana to continue attracting competitive private sector investment.

In October 2017, Government issued bonds secured using revenues from the Energy Sector Levy Act (ESLA) to raise USD 1,400 million to repay cumulative arrears. Government has also started to put measures in place to reduce the Annual Sector Shortfall. The Government has also expressed willingness to transition the operation of the electricity distribution network from ECG to a private sector entity to improve operational efficiency of the utility and fund capital upgrades of system infrastructure. This Document describes further actions by Government needed to improve the financial health of the energy sector: the Energy Sector Recovery Program (ESRP).

The ESRP is a roadmap of immediate, near-term, and medium-term actions needed to achieve Government's aim to bring the sector into balance by the end of 2023, and a commitment by Government to fund the Annual Sector Shortfall (with Sector Stabilization Payments) from 2020 onwards until the sector is in balance to prevent further accumulation of arrears. Some identified actions in the ESRP will be taken immediately (Phase I). Other actions will be initiated in the next twelve months (Phase II). Together Phase I and Phase II actions will reduce the annual sector shortfall and prevent future imbalances, thereby minimizing needed increases in electricity tariffs and/or Sector Stabilization Payments by Government. Additional actions (Phase III) will be required in the next two years to reduce further the shortfall until no Sector Stabilization Payments are required.

Key actions in Phase I include:

- Make full and timely payment of MDA electricity bills;
- Institute a least-cost fuel procurement strategy;
- Adopt a competitive procurement policy for Energy Supply and Service Contracts, including placing a moratorium on unsolicited proposals; and
- Establish an Energy Sector Task Force (ESTF) to further develop, implement, and monitor the impact of the ESRP.

Phase II of ESRP will continue to move toward full cost recovery for gas and electricity, address overcapacity in the power sector, oversupply in the gas sector, and the accumulated Sector Arrears. Ghana will have 4650 MW of power capacity in 2019 to meet peak demand of 2700 MW. Similarly, Ghana has contracted more than 800 mmcfd of natural gas to meet forecasted gas demand from the power sector of 350 mmcfd in 2023 and potential non-power demand of 100

mmscfd for Government's planned fertilizer production and petroleum hub. This results in projected over-supply of gas through 2023 and beyond.

Key actions in Phase II include:

- Address excess take-or-pay generation capacity payments;
- Address the oversupply of gas by matching supply and demand;
- Complete gas infrastructure, pricing, and policy actions to reduce the gas tariff to the power sector;
- Support the technical and operational performance of the electricity transmission infrastructure;
- Adoption of the cash waterfall and any other appropriate mechanism to ensure equity and transparency in disbursement of energy revenues;
- Institute tariffs and regulations on street lighting; and
- Adopt a funding plan for ongoing Sector Arrears.

Key Action Items for Phase III will be developed by the ESTF within the next 18 months for review and approval of the Cabinet sub-committee.

Completing Phase I and Phase II actions is expected to reduce the Cumulative Sector Shortfall over the 2019-2023 period by USD 5,521 million. However, the sector shortfall is not eliminated with these policies alone. A combination of electricity tariff increases and/or Sector Stabilization Payments will also be needed to bring the sector back into balance by 2023 and prevent further accumulation of arrears. Several scenarios are presented which demonstrate the tradeoffs between decisive Action Items, policy changes, tariff increases, and stabilization payments required. Government has a few options to fund the Sector Stabilization Payments, including an allocation from the budget, resource mobilization through a tax or levy, lending to the sector to be recovered in the tariff in future years, or raising funds from capital markets by securitizing future revenue streams. Similar options will be considered to pay for the USD 2,748 million Sector Arrears that have accumulated and the expected 2019 sector shortfall of USD 1,268 million.

This report identifies the major contributors to the financial imbalance, presents a roadmap of actions to restore balance in the sector, and outlines an implementation plan to sustain continued action. In recognition of the importance of the role of energy in reaching Ghana's industrial and socio-economic development goals, Government supported by the new Energy Sector Task Force (ESTF) is committed to further develop, implement, and monitor the impact of the ESRP and taking necessary steps to achieve Financial Viability of the energy sector.

3. OBJECTIVE OF ESRP

3.1 **Immediate Objective:** The immediate objective of the ESRP is to provide a clear and comprehensive roadmap to restore and sustain Financial Viability in the energy sector through key strategic actions, reforms, and implementation of related Action Items recommended in ESRP Phases I, II, and III.

For the purpose of the ESRP, "Financial Viability" means expenses in the energy sector do not exceed revenue collected (i.e., break-even) and funding for the interim shortfall is identified and budgeted for by Government to ensure that no new accumulation of arrears occurs following the ESRP Approval Date.[1]

Based on the impact analysis conducted herein, the ESRP identifies the resources required to bring the sector back to financial balance and recommends strategic options for the Government to fund the remaining sector shortfall and prevent accumulation of arrears. Options for funding the interim shortfall are set out in further detail in Sections 11 and 12 and include a combination of comprehensive Action Items; electricity sector tariff increases; and direct Sector Stabilization Payments by Government.

3.2 **Medium-term Objective:** As a medium-term objective, the ESRP is intended to provide a guiding framework to: (i) increase transparency through the publication of key operational and financial data; (ii) enable continued monitoring of good governance in the energy sector; (iii) implement clear policies that promote and encourage investor confidence; and (iv) strengthen the institutional structure in the sector.

Government's vision of a "Ghana Beyond Aid" is predicated on a thriving private sector as a key driver to future growth and job creation. As such, Ghana must not only strive to remove the barriers to sustained investment such as energy availability, reliability, and cost, but must also ensure fair, competitive and transparent utility operation. As a middle-income country, Ghana is increasingly dependent on financial markets and private investment to fund and drive its development. To attract competitive private sector investment to the energy sector, Ghana must mitigate those factors which contribute to the perceived "country risk premium" assessed by investors. Demonstrated commitment and implementation by Government of a credible long-term financial recovery plan (i.e. the ESRP) is an important element of mitigating the risk perception of the energy sector in Ghana.

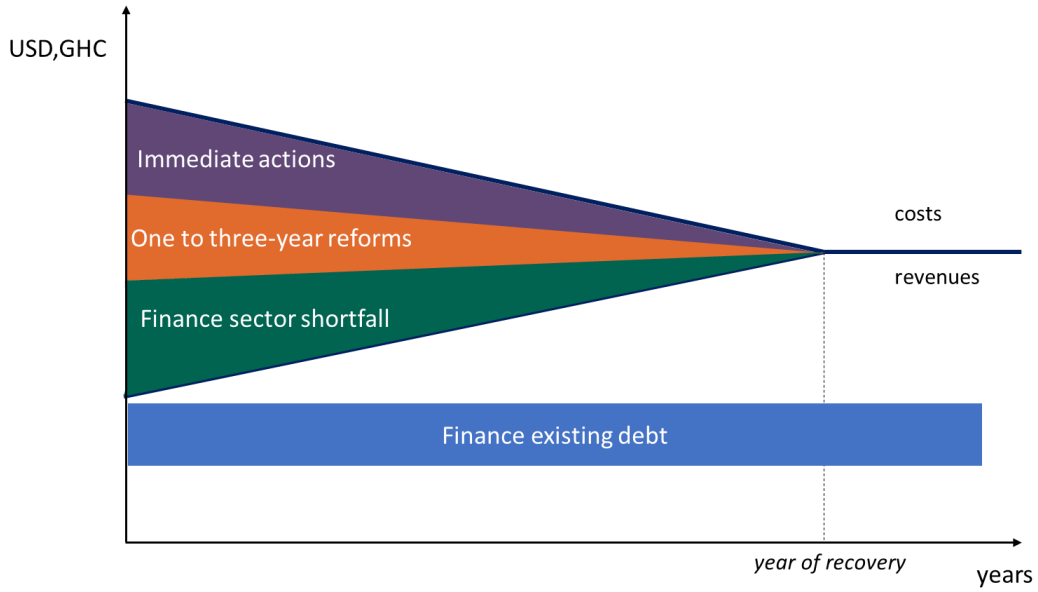
[1] Government commits to fund the annual sector shortfall from 2020 onwards until the sector is in balance to prevent further accumulation of arrears

The ESRP will both improve ownership of ongoing reforms in the energy sector and will demonstrate Government's commitment to improve the financial situation in the energy sector to be an investment destination for private investors.

4. SCOPE OF THE ESRP

The ESRP will cover the calendar years 2019 – 2023 (ESRP Timeline) and will support the implementation of key financial, operational, regulatory, and policy measures to redirect the energy sector towards sustained Financial Viability. To achieve the objectives set out in Section 3, the ESRP will be implemented in three Phases in accordance with the conceptual model below (Diagram 1).

Diagram 1. Conceptual diagram of the Energy Sector Recovery Program



4.1 **ESRP Phase I** includes Action Items that will be implemented immediately upon the ESRP Approval Date. These Action Items are set out in detail in Section 10.1 and have been identified as quick wins and items that will have instantaneous positive financial impact on the sector - reducing expenses and increasing revenue. Phase I also includes the establishment of the ESTF as described in Section 10.1.

4.2 **ESRP Phase II** includes Action Items that will be initiated during the 12-month period following the ESRP Approval Date. Action Items for Phase II have been identified and are set out in further detail in Section 10.2.

4.3 **ESRP Phase III** recommends additional reforms, policy actions, and associated funding options for Government to continue closing the financial gap in the ESRP Timeline. This includes options to reduce Government payments required to prevent additional arrears beyond 2020. While a non-exhaustive list of additional Action Items to be considered for Phase III is included under Section 10.3, the Energy Sector Task Force will be responsible to propose, analyze, and implement additional actions.

4.4 **ESRP Implementation, Monitoring, and Reporting:** The ESTF will be responsible for (i) monitoring the implementation of the ESRP Action Items; (ii) monitoring the ongoing impact of the ESRP Action Items (iii) developing the ESRP Action Items for Phase III; and (iv) conducting ongoing analytical work to update and implement the ESRP Action Items throughout Phases I - III. The ESTF will provide quarterly and annual reporting on the implementation status of the ESRP to the EMT as set out more fully in Section 13.

5. GOG PRIORITIES

The following priorities and objectives guided the process of identifying Action Items included in the ESRP:

5.1 **Security of Supply:** Government highly values the security and reliability of energy supply following the devastating impacts of four years (2012-2016) of power shortages (a.k.a, "*dumsor*") on Ghanaian industry, the economy, and the population. It is paramount that the ESRP improve the security and reliability of energy supply and prevent the return of "*dumsor*" in the future. Government believes that the nation's energy security is based on the security and diversity of fuel supply, reliability of energy infrastructure, and the Financial Viability of the energy sector.

5.2 **Competitive Tariffs:** End-user electricity and fuel tariffs for the commercial and industrial sectors are relatively expensive when compared to tariffs in other developing countries, as per Table 1 below:

Table 1. Average End User Tariff for Commercial and Industrial Users, Comparison of Selected Developing Countries[2]

Country/Region	Ghana	South Africa	India	China	Southeast Asia	Cote d'Ivoire
US cents/kWh	15-19	8-10	8-9	7-8	4-7	15

Government is committed to improving the competitiveness of Ghanaian businesses and Ghana as a destination for foreign direct investment by keeping tariffs as low as feasible. Consequently, the ESRP aims to first reduce expenses to minimize the sector shortfall before considering tariff increases.

5.3 **Support for Low Income Citizens**: Government believes it has a social responsibility to make electricity available to all citizens equitably at a cost which allows the most vulnerable end-users to lift themselves out of poverty. In line with Ghana's Poverty Reduction Strategy (GPRS), PURC has maintained its policy of instituting lifeline tariffs for low income consumers with significantly low consumption levels.[3] The lifeline tariff continues to be provided at below the cost of electricity provision. This subsidy is considered necessary and will be provided for in a transparent and targeted manner.

[2] Energy Commission, *Energy Outlook, 2018; Climatescope 2017*
[3] For consumption levels up to 50 kWh per month

5.1 **Strategic Industries**: Government believes that support for certain strategic industries (such as the bauxite and aluminum and iron and steel industries) is critical for Ghana to achieve its industrial development goals. This support may be manifested in special tariffs that are cross-subsidized by other end-users for supporting economic development and job growth. This subsidy will be provided for in a transparent and targeted manner, and its economic development impact should be monitored to decide whether the program should continue.

5.2 **Universal Access to Electricity and Renewable Energy**: Under the United Nations Sustainable Energy 4 All initiative (SE4ALL), Government committed to achieving universal access by 2030. Ghana's electrification rate is at 84%, making it the second most electrified country in Sub-Saharan Africa. Government considers universal access a top priority as the remaining un-electrified communities and population are the most rural and vulnerable in the country. As such, Government will support further expansion of the distribution system, as well as utilizing renewable energy through mini-grid and off-grid applications to achieve this policy objective. This will also support the national goal set forth in Ghana's Intended Nationally Determined Contribution (INDC) submittal dated September 2015, to scale up renewable energy penetration by 10% by 2030.

6. FINANCIAL STATUS OF THE SECTOR

6.1 **Sector Arrears:** As of the end of 2018, the cumulative net Sector Arrears totaled USD 2,748 million, of which USD 851 million is owed to the private sector. The Sector Arrears represent 5.7% of 2017 GDP or 33% of the Government tax revenue for 2018, which is a concern for the impact it may have on Ghana's fiscal situation.

Significant arrears exist as cross holdings among public institutions and sector SOEs. Ernst and Young is currently undertaking an audit and validation of the stock of arrears in the energy sector. Once this audit is completed, Government will implement a procedure to net out the cross arrears within the public sector. This netting out will lessen any unnecessary financial burden in the energy sector, as well as bring the balance sheets back to appropriate and realistic reflection of the assets in each institution.

The remaining net arrears after the netting process will need to be settled. Government will consider several options to clear the Sector Arrears, including an allocation from the budget, resource mobilization through a tax or levy, lending to the sector to be recovered in future tariffs, or raising funds from capital markets based on securitized future cash inflows.

6.2 **Sector Shortfall in 2019:** Left unaddressed, the sector shortfall in 2019 is expected to widen to USD 1,268 million and will continue to increase and accumulate to more than USD 12,524 million by 2023. Like the historical Sector Arrears, the 2019 sector shortfall will need to be funded by Government. As the shortfall was not anticipated in the 2019 budget, Government will consider other options, including a special allocation from the budget, resource mobilization through a tax or levy, lending to the sector to be recovered through future tariffs, or raising funds from capital markets.

Diagram 2. Projected Sector Arrears including gas take-or-pay obligations (million USD)

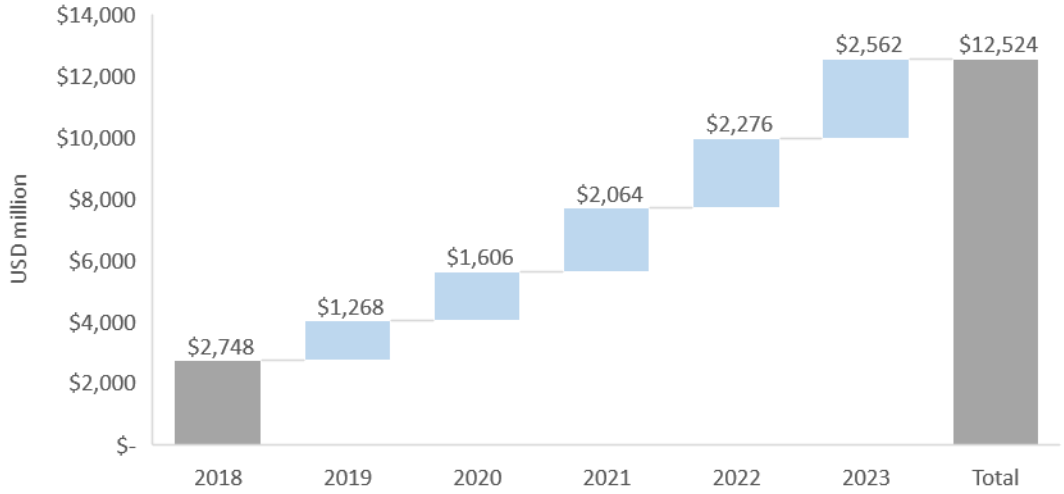


Table 2. Power Sector Cash Flow Summary 2018 (millions)

	Payables (As Billed)	
Summary for 2018	**GHS**	**USD**
Electricity/Gas Billings	8,294	1,810
Levy Billings	1,005	219
Collection losses	(1,861)	(406)
Opex	(3,282)	(716)
Capex	(884)	(193)
Payments to Generators	(4,448)	(970)
Payments to Fuel Suppliers	(1,207)	(263)
Payments to Other Agencies	0	0
Surplus/(shortfall) before debt service	**(2,384)**	**(520)**
Debt Service	(842)	(184)
Surplus/(shortfall) after debt service	**(3,226)**	**(704)**

6.3 **Primary Contributors to Sector Shortfall:** Financial analysis conducted by the Ministry of Energy (MoEn) with support of the Power Africa Transactions and Reforms Program (PATRP) indicates that the "revenue shortfall" within the power sector[4] has been steadily increasing. Looking forward, expenses in the gas sector which are currently not recovered

[4] The "power sector" in the 2016 included ECG, NEDCo, GRIDCo, Bui, and VRA, whereas Ghana Gas was added to the 2017 analysis.

through the gas or electricity tariffs will add to the sector shortfall. The sector shortfall stems primarily from the following factors:

- Excess power generation capacity;
- Excess gas supply;
- Non-payment of electricity bills by some MDAs
- Technical and commercial losses
- Electricity tariffs that do not cover all associated costs of the sector
- Delayed application of the Automatic Adjustment Formula (AAF); and
- Delays in gas infrastructure completion

6.3.1 **Costs Associated with Excess Power Generation Capacity:** In 2018, there was excess power generation capacity in Ghana, which cost an estimated USD 320 million in capacity charges.[5] Power Purchase Agreements (PPAs) are signed on take-or-pay basis, which means that the off-taker pays for the capacity charge even if the power is not used. With new power plants coming on line in 2019, the excess generation capacity will grow and increase the capacity charge costs to USD 620 million annually.[6] Under the current PURC electricity tariff methodology, capacity charges for excess capacity in electricity are not included in the tariff, nor are financing costs for any shortfall. Excluding these costs from the tariff calculation adds to the sector shortfall as they are actual costs incurred by the commitment holder for which there is no anticipated revenue.

6.3.2 **Costs Associated with Excess Gas Supply:** In 2019, gas demand was lower than contracted supply. In addition, infrastructure bottlenecks constrained optimal, least-cost nomination of gas. Government made up the gas supply revenue shortfall by making payments to cover the approx. USD 168 million take-or-pay obligations to OCTP Sankofa. In 2020, excess gas supply will increase by an additional 250 mmcfd, carrying a take-or-pay obligation of USD 822 million annually at an assumed Brent Crude oil price of USD 66 per bbl. In 2022, excess gas supply will increase by a further 180 mmcfd, increasing the take-or-pay obligation by another USD 523 million annually at an assumed Brent Crude oil price of USD 66 per bbl. Like capacity payments for excess power generation, the current PURC gas tariff methodology does not include take-or-pay commitments in the tariff, so costs are incurred without a source of revenue.

6.3.3 **Non-payment of electricity bills by some Ministries, Departments and Agencies (MDAs):** ECG has lost over USD 180 million of revenue annually because of non-

[5] Estimate based on assumption of US$ 0.05/kWh as capacity charge

[6] Addition of 670 MW of new capacity that is currently under construction is expected to come online in 2019 including: Cenpower 340 MW; phase 1 (stage 1 (a)) of Early Power 144 MW (EP phase 2 includes an additional 50 MW); and Amandi 190 MW.

payment. Of this amount USD 150 million or 80% is from non-payment by some MDAs. An amount of over USD 1,300 million (or 47% of total) has been accumulated in arrears to the energy sector.

6.3.4 **Technical and Commercial Losses:** The overall technical and commercial losses in the power sector were 23% in 2018, costing USD 400 million annually. In line with PSP in the power sector, there will be a transition of distribution system operator from ECG to a private sector concessionaire, ECG/PSP. It is anticipated that the KPIs agreed under these Concession Agreements will lead to reductions in technical losses and improved operational efficiency. GRIDCo has also set out an ambitious investment plan to reduce technical losses in the transmission network.

6.3.5 **Electricity tariff reductions implemented in March 2018:**[7] The reduction in tariffs reduced revenue for ECG, NEDCo, and GRIDCo as reflected in their 2018 financial statements.

6.3.6 **Unused Automatic Adjustment Formula (AAF):** PURC has not utilized the AAF to pass-through cost increases that are beyond the control of Government. The following key variables underpin the AAF: Ghana Cedi - USD exchange rate; inflation; realized price of crude oil, natural gas and other fuels; fuel mix (crude oil, natural gas and distillate fuel); generation mix; full power purchase cost (IPPs); and demand forecast variations.

6.3.7 **Delays in Gas Infrastructure Completion:** Delays in infrastructure construction are constraining gas offtake in Takoradi and Tema at an additional cost of USD 20-30 million per month. The reverse flow project, which will interconnect the WAGP and the Ghana Gas Pipeline System at Takoradi, the relocation of the Karpowership from Tema to the Sekondi Naval Base, and upgrades at the Tema metering station (part of TTIP) are expected to be completed in 2019. These will allow higher utilization of OCTP Sankofa gas, reducing payments for unutilized natural gas, which is not considered in PURCs tariffs and reducing fuel consumption costs for the Karpowership barge.

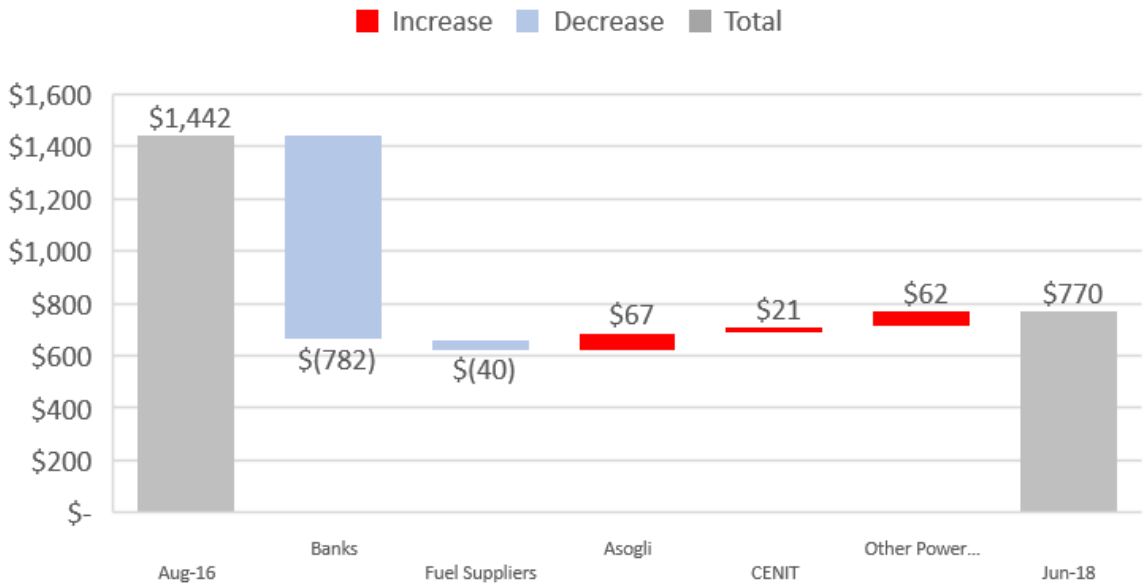
[7] Tariff reductions in April 2018 included a reduction of 17% for residential consumers and 30% for commercial consumers.

7. ACTIONS ITEMS COMPLETED

Government has already begun implementation of several administrative actions, reforms, and policies which were designed to mitigate the issues outlined above:

7.1 **ESLA Bond:** Government issued two series of bonds totaling GHS 5.66 billion in 2017 and 2018, which were securitized by a portion of the ESLA tax revenue. In late 2017 and early 2018, Government used the proceeds to retire certain debts of the SOEs, primarily debts held by the banking sector. The ESLA bond program reduced the net legacy debt by approximately GHS 5.453 billion or approximately half of the amount outstanding as of FY 2016.

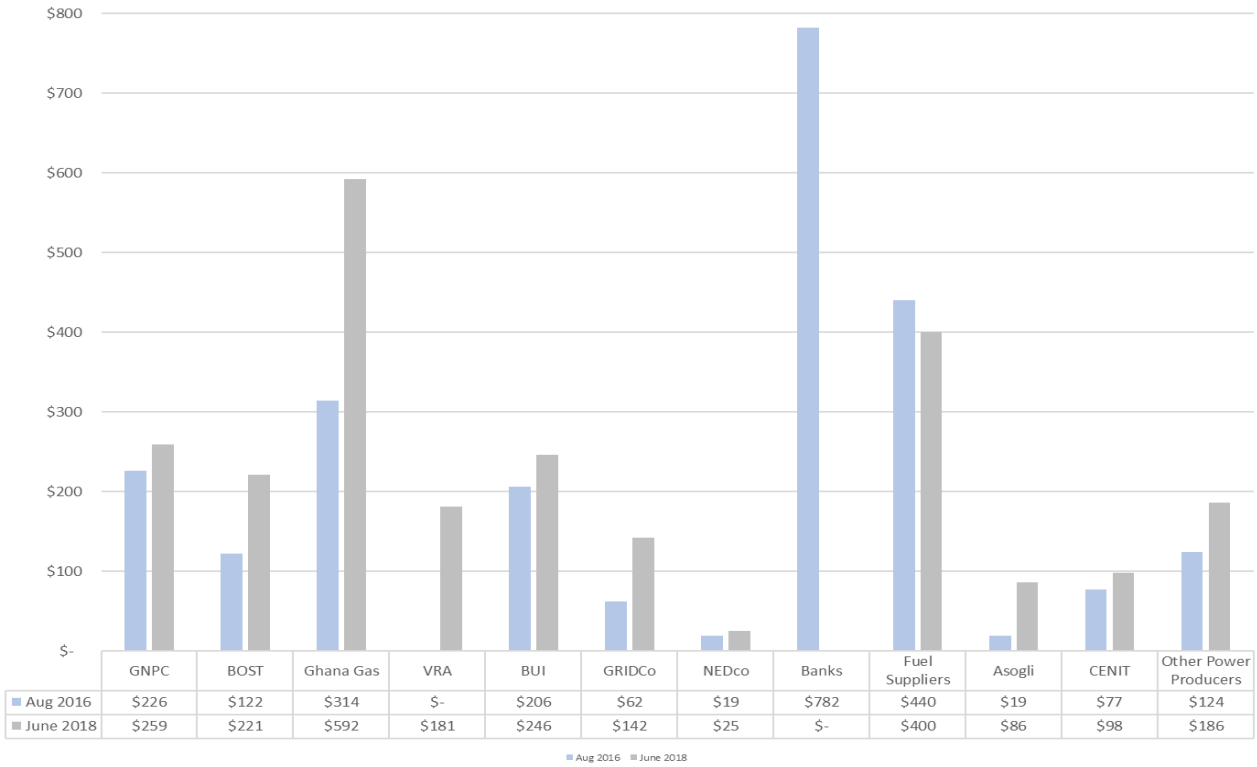
Diagram 3. Reductions in arrears to the private sector from ESLA proceeds



Arrears of USD 500 million remain outstanding to liquid fuel suppliers[8] and over USD 100 million to IPPs. As the ESLA proceeds were utilized through on-lending to the SOEs, the process has not eased the burden on the SOE balance sheets. Government is considering another round of bond issuance through the ESLA SPV platform. However, projected revenues from the ESLA structure would not be sufficient to support additional bond issuance in the near future.

[8] This excludes over USD 1 billion outstanding on the gas

Diagram 4. Payables before and after ESLA proceeds arrears clearance (USD million)



	GNPC	BOST	Ghana Gas	VRA	BUI	GRIDCo	NEDco	Banks	Fuel Suppliers	Asogli	CENIT	Other Power Producers
Aug 2016	$226	$122	$314	$-	$206	$62	$19	$782	$440	$19	$77	$124
June 2018	$259	$221	$592	$181	$246	$142	$25	$-	$400	$86	$98	$186

7.2 **Review of Thermal and Renewable Energy PPAs**: Historically, Ghana has relied almost entirely on negotiated transactions arising from unsolicited proposals. As a direct consequence, a series of IPP projects procured over the 2012-2016 period threaten Ghana's power system with high excess costs resulting from significant over-capacity and high costs. These uncoordinated procurements of IPP projects resulted in a glut in installed generation capacity. Consequently, in 2017 the MoEn, acting on the directive of the Office of the President of the Republic of Ghana, constituted an Inter-Ministerial Committee (the '**PPA Review Committee**') to review the fiscal and legal implications of PPAs executed by ECG for the purchase and supply of electrical energy from Independent Power Producers (IPPs) for both thermal and renewable PPAs portfolios for the period 2018 - 2027. The thermal PPA report was compiled and reviewed by the Attorney General.

The Committee, which was chaired by the Executive Secretary of the Energy Commission, worked under two sub-committees: Legal and Fiscal/Technical sub-committees. The findings of the report clearly established that even though capacity additions would be required to meet future demand, the schedule of capacity additions would result in excess capacity required for the sector including a generous reserve margin. As such, to avoid further excess capacity costs, the Committee concluded that certain PPAs would need to be terminated and/or modified (deferred or downsized). These terminations and modifications themselves come at a cost and the Committee recommended various scenarios to terminate or modify these PPAs.

7.3 **Approval by Cabinet and Request for Combined Thermal and Renewable Energy PPA Review Report:** Following a review by the Attorney General, the thermal project PPA Review Committee report was approved by Cabinet, and MoEn has started implementation of the recommendations set forth in the report, mostly by rescheduling planned commercial operation dates, and in some cases reduced tariff charges, for "pipeline" projects (i.e., projects with executed PPAs but have not yet reached financial close).

The Energy Commission also led a team to review the renewable energy PPAs in a similar manner. The report has been presented to the MoEn, but has not yet been approved.

As both the thermal and renewable review reports were compiled in 2017 and 2018 respectively, the recommendations made in these reports are now outdated and have not been aligned with the most recent demand projections in the latest IPSMP. The MoEn has therefore requested that the PPA Review Committee issue an updated, combined report on both thermal and renewable energy PPAs, including updated recommendations for the "pipeline" projects with executed PPAs.

In 2019, the MoEn embarked on a process to restructure PPAs for those projects which were already in operation or were expected to shortly reach commercial operation in an effort to minimize tariffs and/or "take-or-pay" obligations. In August 2019, the Minister of Finance announced the commencement of a three-month collaborative process to restructure the PPAs, which is currently ongoing. The revised and consolidated thermal and renewal project report from the PPA Review Committee will need to incorporate developments which arise from the PPA restructuring discussions.

7.4 **Reduction in Gas Price**: Following a review of cost components, the gas tariff (the cost of delivered gas) to power producers was reduced from USD 8.84 per MMBtu to USD 7.29 per MMBtu effective March 15, 2018.

7.5 **Rollout of Prepaid Meters:** ECG and NEDCo have made the deployment of prepaid meters a cornerstone of their strategic efforts to reduce electricity theft and improve collection ratios. The investments in pre-paid meters are expected to reduce theft and non-payments and lead to improvement in the profitability of the two distribution companies. It is expected that a private sector concessionaire would be responsible for achieving agreed benchmarks with respect to collections and distribution losses for the ECG system. This would be enshrined in any Concession Agreements. NEDCo's multi-year plan to deploy prepaid meters is below.

Table 3. NEDCo's multi-year plan to deploy prepaid meters

Year	Planned	Deployed	Budget (USD)
2017	100,000	25,000	3,635,000

2018	163,000	125,000	18,175,000
2019	150,000	-	37,500,000
2020	180,000	-	45,000,000
2021	100,000	-	25,000,000

8. DEMAND AND SUPPLY PROJECTIONS AND OTHER KEY ASSUMPTIONS

A financial forecasting model was developed to identify the impact of proposed Action Items and assess their effect on the Financial Viability of the energy sector. This section describes the assumptions used in the Financial Model for the period from 2019 to 2023.

8.1 **Power Sector Demand and Supply Projections:** The Integrated Power Sector Master Plan (IPSMP) was developed in coordination with all power sector stakeholders and chaired by the Energy Commission. The long-term "least-regrets" power plan and the associated fuel requirements reflects coordinated power procurement based on a consensus forecast by all stakeholders.

Currently, Ghana has excess generation capacity available to the grid. Net dependable capacity as of December 2018 was 3,982 MW,[9] which is expected to increase to approximately 4,650 MW by the end of 2019 with the addition of 670 MW of new capacity that is currently under construction, including: Cenpower 340 MW; phase 1 of Early Power 144 MW;[10] and Amandi 190 MW. The current system peak demand (including exports) was recorded in February 2019 as 2,691 MW and is estimated to grow to 3,300 MW by 2022 under the IPSMP reference case scenario.[11]

Based on the most probable electricity demand projections available, ***there is no need for new additional generation capacity until 2027*** - when the Karpowership barge PPA expires. Additional generation capacity prior to 2027 is only warranted if the *total* cost of a new generation plant is less than the *marginal* generation (energy) cost of existing plants—in other words, any new plant built before 2027 must be cheap enough to bring down the total cost of generation.

[9] Net dependable capacity in December 2017 was 3,966 MW, according to the Energy Statistics 2018, Energy Commission. The only new plant added in 2018 was the Meinergy Solar Plant, which is assumed to add 16 MW of net dependable capacity.

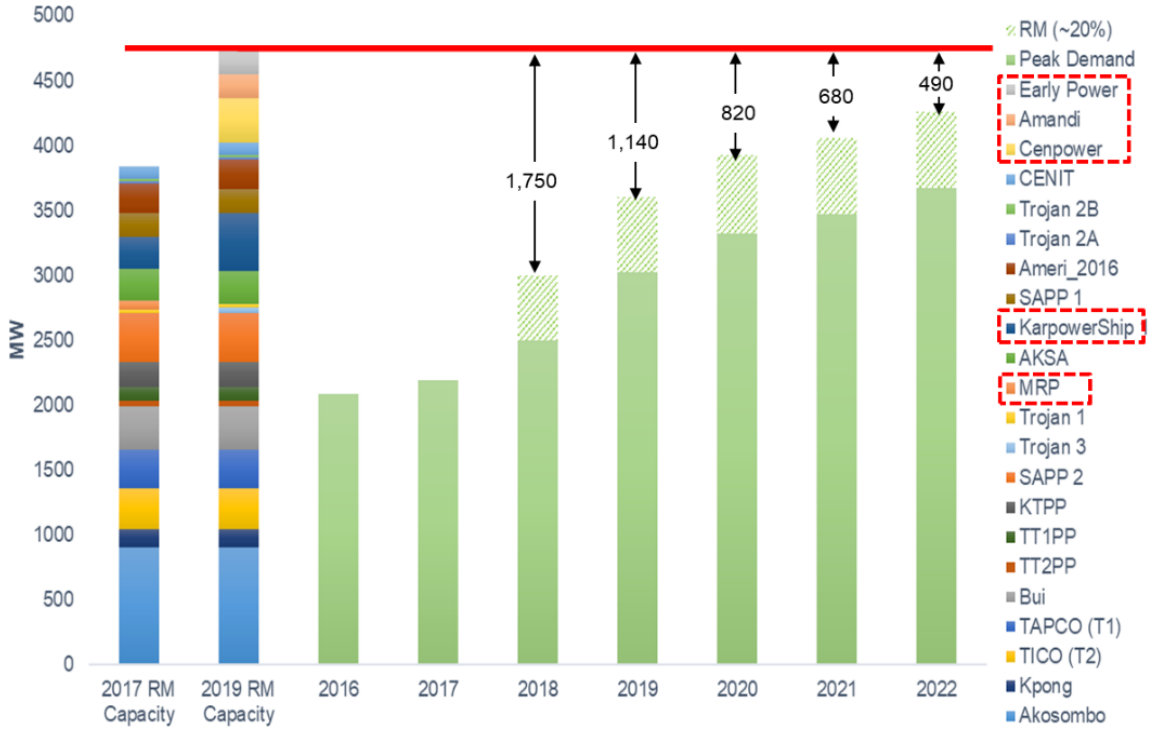
[10] Early Power phase 1 comprises of two stages: stage 1(a) of 144 MW due to come online in Q4 2019; and stage 1(b) due to come online in Q4 2020.

[11] Integrated Power System Master Plan, Volume 2. See: http://energycom.gov.gh/files/Ghana%20Integrated%20Power%20System%20Master%20Plan%20_Volume%202.pdf

While Ghana is facing a surplus generation capacity, growth of demand on the national power grid has slowed during recent years. **The present non-residential tariff structure does not provide incentive for higher consumption for productive uses**. Large electricity consumers find it cheaper to self-generate rather than buying grid supplied power. High power prices also prevent exports to potential markets in neighbouring countries.

Even if electricity demand growth is much stronger than assumed in the reference case scenario,[12] additional capacity is not required in the short-term. For example, under the optimistic (low probability), high demand scenario, and after including a significant 20% reserve margin, additional generation capacity is not required until 2024, by which time the AKSA Power Plant would have been retired.[13]

Diagram 5. Medium-Term Supply-Demand Balance for Reference Electricity Demand[14]



The Energy Commission intends to update the IPSMP modelling periodically, with the next update scheduled for mid-2019. An annual review process will allow the IPSMP to

[12] Integrated Power System Master Plan, Volume 2. See: http://energycom.gov.gh/files/Ghana%20Integrated%20Power%20System%20Master%20Plan%20_Volume%202.pdf

[13] Assumptions used in the projection are discussed in section 7.4.3 of the IPSMP Volume 2

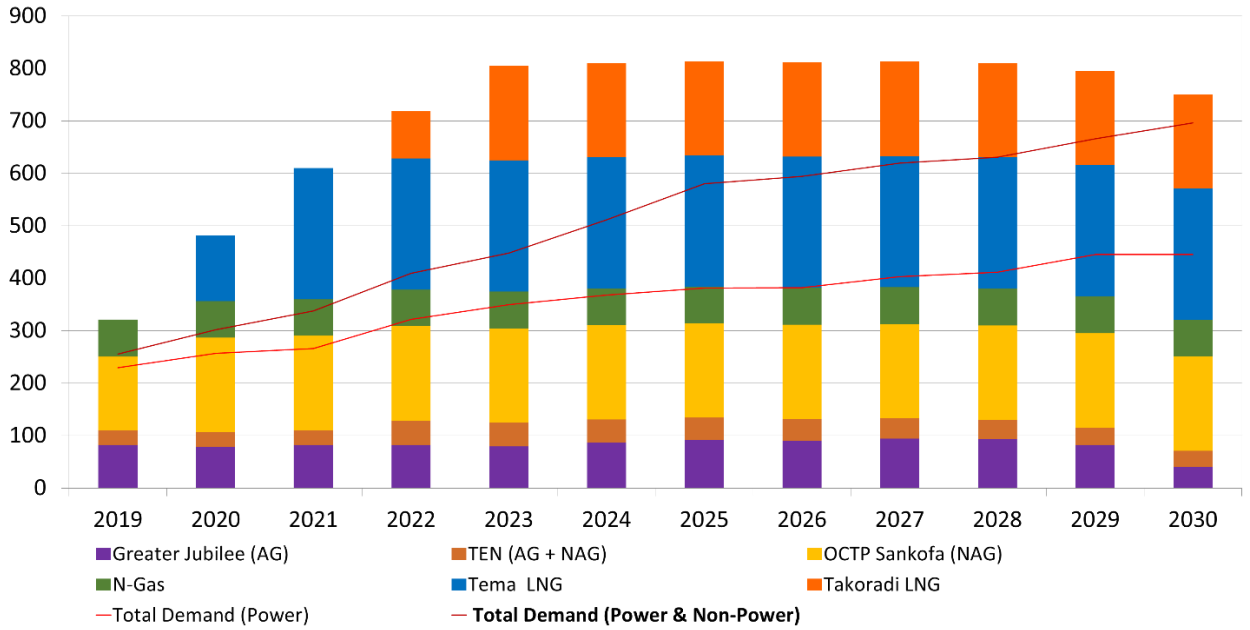
[14] Red dashed boxes in legend indicate which projects were added or removed between 2017 and 2019

incorporate any changes to observed and projected demand to assess any required changes to the competitive procurement schedule with enough lead time to procure new capacity.

8.2 **Natural Gas Demand and Supply Projections:** In 2019, Ghana is producing gas from three fields – Jubilee, TEN, and Sankofa – and has scope for greater domestic production in the coming years. Ghana currently imports gas from Nigeria through the West Africa Gas Pipeline (WAGP) and has contracted supplies of LNG scheduled for arrival in 2020 and 2022 through the Tema LNG and Takoradi LNG projects, respectively. Diagram 7 below presents the gas supply and demand balance from 2019 to 2030.The bars above the red lines represent the potential over supply of gas, which would result in significant take or pay obligations for unutilized gas supply and regasification capacity, equivalent to USD 1,361 million per year in 2023. Diagram 7 also shows that current domestic and pipeline gas supply will be sufficient for power generation up to 2023.

Diagram 7 shows that in 2022 and in 2023, combined power and non-power gas demand exceeds the supply available in 2019. The shortfall in 2023, however, is relatively small and could be accommodated by changing the dispatch of available supply. If Nigerian gas through the West African Gas Pipeline becomes more reliable, it would be a flexible source of supply. Sankofa also could provide flexibility because maximum production is 260 mmcfd, exceeding the planned 180 mmcfd offtake. Adjusting production at OCTP Sankofa can be used to respond to unexpected supply losses once current infrastructure constraints are removed.

Diagram 6. Gas supply and demand balance (mmcfd)



8.2.1 **Non-power gas demand:** Government is promoting greater non-power use of natural gas for industry, transport, fertilizer production, and a petroleum hub to create jobs and grow local economies. In 2023, in line with Government's plans to develop non-power uses for gas, the ESRP analysis forecasts a more-than ten-fold increase in non-power demand. Natural gas is a feedstock for fertilizer (ammonia, urea) and petrochemicals. For domestic fertilizer production to be competitive with alternatives, the natural gas price must be very low, around USD 2.50 per MMBtu. Therefore, Government is considering allocating low-cost, associated gas for these uses due to the overall macroeconomic benefits of developing those industries. However, allocating specific quantities of low-cost gas to selected industries has consequences that need to be considered further.

Selling low-cost natural gas to produce fertilizer and petrochemicals means that Government will have limited space to provide low-cost gas to the power sector. The combined impact of diverting the cheapest gas to industry and buying relatively expensive gas through LNG imports may raise prices for the power sector. Based on the prices and volumes of Ghana's current gas contracts, the delivered price of gas to the power sector could increase from the USD 6 per MMBtu to more than USD 8.50 per MMBtu with implications for the price of electricity for consumers and the competitiveness of industry. The increase in cost to the power sector should be assessed against the benefits of local fertilizer and petrochemical production. Additional cost-benefit analysis is required in the course of ongoing feasibility studies for the proposed projects.

8.2.2 **Balancing in 2019:** In 2019, natural gas is primarily used as fuel in the power sector (about 96%) with small volumes of gas being used in industry. Ghana has excess gas supply in 2019. Potential reductions in associated gas supply from the Jubilee and TEN fields are limited due to the negative impact on oil production and production of LPG for the domestic market. In 2019, balancing supply can be achieved by reducing the offtake from Sankofa, which may be achieved by deferring the offtake of Ghana's share of the field production.

8.2.3 **Balancing in 2020:** In 2020, Ghana's excess gas supply will significantly grow with the arrival of the first LNG supplies. Balancing supply and demand will require further action than in 2019. It is necessary to take active measures to balance supply to meet projected demand to avoid paying for gas that is not used.

8.2.4 **Balancing in 2023:** In 2023, in line with Government's plans to develop non-power uses for gas, the ESRP analysis forecasts a more-than ten-fold increase in non-power demand in addition to steadily increasing gas demand for the power sector. Beyond 2023, the non-power gas demand could increase more quickly, particularly if a planned fertilizer project is successfully developed in the coming years. Current best estimates suggest offtake for

fertilizer would not begin until 2024, outside of the current analysis period of the ESRP Timeline.

Excess gas supply is projected even when non-power gas demand is assumed to increase ten-fold. Government will ensure the power and natural gas supply equals demand to avoid unnecessary payments for excess supply and will do so while ensuring that the actions taken are in accordance with national laws and existing contractual arrangements.

8.3 **Business-As-Usual (BAU) Assumptions.** The key assumptions used in the BAU projections to 2023 are as follows:

Gas Infrastructure:

- Takoradi - Tema Interconnection Project (TTIP), which is essential for west-to-east flow of gas (through the West Africa Gas Pipeline (WAGP)). Without the reverse flow arrangement gas plants in the east (Tema power enclave) will continue to have fuel insecurity, while plants in the west will be under significant pressure to maintain high operational availability to utilise gas. TTIP is expected to be completed by Q3, 2019.
- To further address the imbalance of gas supply between west and east, Government will move the Karpowership barge (450MW) from its current location in Tema to the Sekondi Naval Base where it would be converted to run on domestic gas. The relocation is expected to be completed in 2019 Q3.

Domestic supply:

- Jubilee is assumed to be between 90-100 mmcfd.
- TEN is assumed to be between 30-50 mmcfd.
- OCTP Sankofa is initially below take-or-pay levels of 140 mmcfd, but with production capacity of 260 mmcfd available to achieve higher production and use of make-up gas.

Imports:

- Imports from N-Gas through the West African Gas Pipeline are assumed at 70 mmcfd, as the 90 mmcfd take-or-pay obligation remains suspended due to force majeure.
- Imports at the Tema LNG are assumed in the second half of 2020 at 250 mmcfd.
- Imports at the Takoradi LNG are assumed in the second half of 2022 at 180 mmcfd.

Demand:

- Gas demand from the power sector is assumed at 230 mmcfd in 2019 growing to 350 mmcfd in 2023.
- Non-power demand – including fertilizer and industry– is assumed at 8 mmcfd in 2019 growing to 110 mmcfd in 2023.

Gas tariff:

- The delivered gas tariff charged to the power sector is assumed at USD 7.29 per MMBtu in the BAU scenario. This is based upon PURC's current gas tariff and held flat throughout the projection period.
- The price is assumed at USD 6 per MMBtu when Phase II Action Items are complete.

Table 4. Gas Supply Assumptions (mmcfd)

Contracted Gas Supplies (MMscfd)					
Year	2019	2020	2021	2022	2023
Total Supply	337	498	627	737	823

Table 5. Gas Demand Assumptions (mmcfd)

Gas Demand (MMscfd)					
Year	2019	2020	2021	2022	2023
Power Sector (Updated IPSMP Ref Case)					
Total Demand (Power)	229	257	266	322	350
Western Region					
Total Non-Power Western Region	26	39	53	63	72
Eastern Region					
Total Non-Power Eastern Region	0	6	19	25	26
Total Non-Power Demand	26	45	72	88	98
Total Demand (Power & Non-Power)	255	302	338	409	448

8.4 Other Key Assumptions Used in the 'Business as Usual' Scenario

- Term of the BAU scenario used for the projections is a 5-calendar year period starting at 1 January 2019.
- The gas and power sector forecasts are modeled separately. Financials for GNPC and GNGC were not included. The power sector forecasting model includes ECG, NEDCo, GRIDCo, BPA, and VRA.
- A flat exchange rate of 5.00 GHS per USD for the 5-year analysis period
- Average end-user tariffs as per 2018 PSCF model for the period after the March 2018 tariff reduction and held unchanged thereafter (73 pesewas/kWh for ECG, 65 pesewas/kWh for NEDCo, confirmed as reasonable by PURC).
- Collections assumptions for ECG and NEDCo - per 2018 actuals with no improvement over the 5-year period.

- Distribution losses per NEDCo and ECG 2018 benchmarks and no improvement over the 5-year period.
- Operating Plant Assumptions:
    - AKSA contract maintained at 330 MW and decommissioned in September 2023
    - Cenpower and Amandi reach COD in 2019
    - Early Power phase 1 reaches COD in 2020
    - Ameri PPA remains as revised in 2018 and is transferred to VRA in February 2022
    - Karpowership remains on HFO (conversion to gas will be included in ESRP Phase I actions)
    - TAPCO is refurbished at no cost and continues operations
    - The only new plant to come online which has not already begun construction (i.e., Amandi, Early and Cenpower) during analysis period is Marinus in 2020
    - The T3 refurbishment is not included
- VALCO operating at 2 potlines on P69 Technology (2019-2021) and Phase I of D18+ Cell Technology upgrade project completes in December 2021 and ramps up during 2022/23
- VALCO tariff 3.5 US¢/kWh
- PPA terms are based on signed contracts (where available). Other information is based on average generation costs provided by ECG or assumptions reviewed by Director, Generation for reasonableness
- HFO price assumed 2018 average of $10.90/MMBtu per EMOP reports and kept flat for 5 years
- SOE operating and maintenance and capital expenditures are based on 2017 actuals and escalated at 4% per year
- Levies are not included;
- Debt profiles as of January 1, 2019 per SOE submissions
- ECG is assumed to continue as is without any concession to a private sector partner.

8.5 **Information Provided to ESRP Working Group:** All figures, diagrams, data, and other inputs including key assumptions used in the projections, Financial Model, and in the drafting of this ESRP Document and the Action Items contained herein, are based on information provided to the ESRP Working Group by Government and, for the purposes of this Document, are considered to be true and correct in all material respects. The ESTF will continue to refine the analysis contained herein on an ongoing basis as further contractual information or data becomes available to the ESTF.

9. RESULTS OF FINANCIAL MODEL in BUSINESS AS USUAL

Key results from the Financial Model are presented below.

9.1 **Financial Projections:** 'Business as Usual' financial projections from 2019 to 2023 indicate an annual revenue shortfall in the power sector of around USD 1,000 million and an annual revenue shortfall in the gas sector, which rises to USD 1,569 million in 2023 due to LNG take-or-pay obligations. As a result, the sector shortfall increases from USD 1,275 million in 2019 to USD 2,571 million in 2023 or about 14% of 2018 total tax revenue. The resulting accumulated sector arrears would grow to USD 12,564 million or more than 25% of 2017 GDP by 2023.

Table 6. Projected Energy Sector Shortfall and Arrears

Energy Sector (Power & Gas) US Dollars

Energy Sector (Power & Gas)		2019	2020	2021	2022	2023
Power Sector Shortfall	US $ MN	1,034	1,093	1,110	1,024	1,002
Gas Sector Shortfall	US $ MN	241	520	962	1,261	1,569
Annual Energy Sector Shortfall	**US $ MN**	**1,275**	**1,613**	**2,072**	**2,285**	**2,571**
Legacy Debt as at 2018	**US $ MN**	**2,748**				
Accumulated Arrears	**US $ MN**	**4,023**	**5,636**	**7,708**	**9,993**	**12,564**

9.2 **Power Sector:** The average electricity tariff continues to be below cost of service from 2019 onwards. Capacity charges for excess generation capacity, transmission and distribution losses, non-payment of energy bills, and commercial losses are the main factors that undermine Financial Viability of the power sector.

Table 7. Driver of Power Sector Shortfall- Average tariffs for the commercial and industrial sectors

Energy Sector		2019	2020	2021	2022	2023
Average Tariff (Invoiced revenue/kWh sold)	US $ / kWh	0.12	0.12	0.12	0.12	0.12
Cost of Generation (Total costs/kWh produced)	US $ / kWh	0.17	0.18	0.20	0.20	0.20
Cost of Service (Total costs/kWh sold)	US $ / kWh	0.20	0.22	0.24	0.24	0.24
Cost of Excess Capacity (Excess capacity/kWh sold)	US $ / kWh	0.02	0.02	0.02	0.02	0.02

9.3 **Gas Sector:** In the absence of gas aggregation and with the current PURC gas tariff methodology, GNPC is not fully recovering the cost of gas sold to the power sector. As long as GNPC sells gas at the PURC regulated weighted average cost of gas of USD 7.29 per mmBtu, and purchases gas at USD 9.42 per mmBtu (or anything more than the regulated tariff), GNPC has not been able to recover all of their costs. The annual loss or under recovery is estimated at USD 73 million for 2019 and will grow as the gas sales volume increases. However, mitigation measures are being considered to remedy this situation. As the gas

demand and supply analysis indicated, Ghana has excess gas supply through 2023. In 2019, GNPC faces USD 168 million in OCTP Sankofa take-or-pay obligations for gas that is not consumed. Beyond 2019, the full take-or-pay volumes of gas will be needed to meet supply. Beginning in the second half of 2020, GNPC faces take-or-pay obligations of USD 822 million annually[15] for gas from the Tema LNG project that is projected to be in excess of supply. From 2022, GNPC faces additional take-or-pay obligations of USD 523 million annually[16] from the Takoradi LNG project for gas that is projected to be in excess of supply.

Table 8. Drivers of Gas Sector Shortfall

Gas Sector		2019	2020	2021	2022	2023
Under-recovery	US $ MN	73	109	140	164	197
Sankofa TOP	US $ MN	168	-	-	-	-
Tema LNG TOP	US $ MN	-	411	822	822	822
Takoradi LNG TOP	US $ MN	-	-	-	275	550
Annual Losses	**US $ MN**	**241**	**520**	**962**	**1,261**	**1,569**
Cumulative Losses	**US $ MN**	**241**	**761**	**1,723**	**2,984**	**4,553**

[15] Assumes Brent Crude oil price of USD 66 per barrel
[16] Assumes Brent Crude oil price of USD 66 per barrel

10. THE ENERGY SECTOR RECOVERY PROGRAM

The ESRP will be implemented in three Phases: Phase I – immediate actions; Phase II – near-term actions to be initiated within 12 months of ESRP Approval Date, and Phase III – medium-term actions yet to be developed which should occur before 2023. Action Items in each phase will be monitored and evaluated until the program achieves its objective – full restoration of energy sector to Financial Viability as defined in Section 3, no further accumulation of arrears beginning in 2020,[17] and payment of outstanding Sector Arrears. To prevent accumulation of arrears in 2020 and beyond, Government will make sector shortfall payments while the sector shortfall is reduced annually by the Action Items. Implementation of any Action Item(s) under this ESRP will be conducted in compliance with national laws and existing contractual arrangements.

For each Action Item a Completion Date is provided, Responsible Parties are identified, and the Budget[18] Required and Expected Impact are estimated. The Required Budget assumes costs, expenditures, fees, and liabilities associated with implementing the Action Items. Expected Impacts are calculated based on the Financial Model where available and are otherwise estimated by Government.

10.1 **ESRP PHASE I:** The policies identified under Phase I will have an immediate impact on reducing the sector revenue shortfall. It is assumed that these will be within Government control and will be implemented immediately after the ESRP Approval Date.

10.1.1 MOF to Pay for MDA Electricity Bills

The MOF will pay the outstanding electricity bills on behalf of select MDAs, which payment will be clawed back from respective MDA budget allocations. This will be a temporary and transitional measure, which will be applied to all MDA installations categorized as "Non-strategic". The Cabinet has approved a categorization of all MDAs into "Strategic" and "Non-strategic" and has issued a directive, which includes a financing plan, for the installation of pre-paid meters in facilities of all "Non-strategic" MDAs. Once fully installed, all "Non-strategic" installations will be provided with the budget to pay for their electricity bills. MOF will budget for and include as a line item in the Annual Budget regular direct payments of the electricity bills of Strategic MDAs (as this categorization is updated from time to time) to ECG (and any private sector partner) and NEDCo. During the transition period, information concerning energy consumption of each "Non-strategic" installation will be collected and provided to the respective MDA to ensure transparency

[17] Government commits to fund the annual sector shortfall from 2020 onwards until the sector is in balance to prevent further accumulation of arrears

[18] The budget requirement does not presuppose the source of the funding. It estimates the cost of carrying out the Action Item.

and to incentivize efficient use of electricity. A post audit will be conducted on electricity bills paid on behalf of MDAs.

Expected Completion Date:	Q2 2019
Responsible Party:	MOF
Budget Required:	Budget allocation of USD 150 million has already been included for 2019
Expected Impact:	USD 150 million per year of increased revenue

10.1.2 Least Cost Fuel Procurement Strategy

Government will adopt a least-cost fuel procurement policy that mandates fuel purchases and gas nominations based on lowest delivered marginal cost. The policy is meant to minimize the fuel bill (natural gas and liquid fuels) accrued by the power sector while honoring existing contracts and maintaining reliable power. The strategy will consider take or pay obligations, make up gas rights, commodity costs of different supply options, and differing transportation costs and levies. The policy will mandate the volumes of gas to be nominated. The nominated gas will then be sold at the composite price, as regulated by PURC.

Expected Completion Date:	May 2019
Responsible Party:	MoEn, EC
Budget Required:	USD 0 million
Expected Impact:	USD 180 million per year of reduced costs

10.1.3 Competitive Procurement of Energy Supply and Service Contracts

MoEn will adopt a policy for competitive procurement of energy supply and services contracts that mandates procurement of energy in a sustainable and least cost manner. The policy will direct that: (a) all future procurement of energy supply is directly linked to demand and supply forecasting (published by Energy Commission and in line with the IPSMP); and (b) procurement of additional capacity or supply be conducted through an open and competitive process. The policy will place a clear moratorium on all unsolicited proposals from IPPs and fuel suppliers, in that no further contracts (PPAs and GSAs etc.) may be signed unless such proposal is subject to competitive tender. The policy will direct that EC shall not grant any license and PURC shall not approve any tariff or provide for the recovery of costs of power and gas supply contracts, unless such contracts were the result of a transparent and competitive bidding process.

Expected Completion Date:	May 2019
Responsible Party:	MoEn
Budget Required:	USD 0 million
Expected Impact:	Prevention of further deterioration in financial status of sector.

10.1.4 **MoEn to establish the Energy Sector Task Force (ESTF)**

Upon the Approval Date of this ESRP, the MoEn will, in accordance with Section 13 of this ESRP, establish the ESTF to facilitate the implementation, monitoring and evaluation of the ESRP. Responsibility for the creation, approval, implementation, monitoring, updating and periodic reporting (quarterly and annual) of the ESRP will be supervised by the EMT, in close coordination with the Office of the Vice President, MOF and MoEn. The ESTF will be chaired by the Minister of Energy. The Chair of the ESRP Working Group will also be a member of the ESTF.

Expected Completion Date:	Q2 2019
Responsible Party:	MoEn
Budget Required:	USD 150,000 per annum
Expected Impact:	Successful implementation, monitoring, update and reporting on the ESRP

10.2 **ESRP PHASE II:** Action Items under Phase II of the ESRP will be initiated within 12-months following ESRP Approval Date. These actions are obligatory and will contribute to a reduction in the sector shortfall or prevent future increases in the sector shortfall.

10.2.1 **Sector Arrears to be netted out and funding plan to be adopted to clear the remaining balance**

Ernst & Young has been engaged to audit and verify the outstanding stock of arrears in the energy sector.[19] Once this audit is completed, Government will implement a process to net out the cross arrears within the public sector SOEs. Government will explore refinancing options to clear out the remaining arrears and any additional accumulation from the 2019 sector shortfall. Government will approve a funding plan for clearing the remaining balance of inter-agency debt. Government has a few options to fund the Sector Stabilization Payments, including an allocation from the budget, resource mobilization through a tax or levy, lending to the sector to be recovered in the tariff in future years, or raising funds from capital markets backed by securitized revenue streams.

Expected Completion Date:	Q2 2020
Responsible Party:	MoEn/MOF
Budget Required:	less than[20] USD 2,748 million + 1,268 million
Expected Impact:	USD 2,748 million + 1,268 million

[19] Remaining net, outstanding and legitimate debts of the sector SOEs is estimated at USD 2,747 million as of Q3 2018

[20] The budget required depends on the results of netting out Sector Arrears and the method of clearing the Sector Arrears and additional Sector Shortfall accumulated in 2019.

10.2.2 Reduce gas purchase commitment to a level that matches forecast gas demand

Government will ensure natural gas supply equals demand to avoid unnecessary payments for excess supply and will do so while ensuring that the actions taken are in accordance with national laws and existing contractual arrangements. Indicative options are included in the modeling projections to demonstrate the impact. Specific options will need to be analyzed urgently and the selected approach implemented before the end of 2019.

Responsible Party:	MOF, MoEn, GNPC
Budget Required:	USD 1,100 million, estimated
Expected Impact:	USD 1,400 million per year

10.2.3 Full completion of Takoradi Tema Interconnection Project (TTIP)

The constraint on the gas transportation capacity and off-take of domestic gas has had a profound impact not only on the supply security of Ghana, but also on the financial viability of the sector. The full completion of TTIP would enable transportation of up to 140 mmcfd of gas from Takoradi to Tema, which will enable the domestic gas to be fully utilized thus saving costs and internalizing the value that would have been exported through import of liquid fuels.

Expected Completion Date:	Q3 2019
Responsible Party:	GNPC, MoEn
Budget Required:	USD 170 million
Expected Impact:	Reduction of future take or pay payments for unutilized gas

10.2.4 Relocation and conversion of Karpowership

The Karpowership barge, currently located in the Tema Power Enclave, will be relocated near the Takoradi Power Enclave. When construction of power evacuation and a gas feeder line is complete, the Karpowership engines will be converted to run on natural gas instead of HFO. Karapowership will be available to increase the offtake of domestic gas.

Expected Completion Date:	Q3 2019
Responsible Party:	GNPC, GNGC, MoEn
Budget Required:	USD 50 million
Expected Impact:	USD 103 million per year in fuel cost savings

10.2.5 ECG/NEDCo to install prepaid meters for "Non-strategic" MDA installations

MoEn, in collaboration with ECG/NEDCo, will ensure that pre-paid meters are installed in all non-strategic MDAs, which installation will be verified by an audit. It is expected that the private sector partner will continue to install pre-paid meters at Non-strategic installations. MoEn in collaboration with both ECG/PSP and NEDCo will establish a system to monitor the installation of prepaid meters. As the installations progress, the

relevant Non-strategic MDAs will transition to paying for their own consumption, while investment planning will continue for NEDCo to transition to prepaid meters. In recognition of the limitations of pre-paid metering on loss reduction, additional measures such as: revenue protection programs and incorporation and systematic use of information systems etc., should be considered and pursued in parallel.

Expected Completion Date:	Q2 2020
Responsible Party:	MoEn/ECG/NEDCo
Budget Required:	TBD for the PSP. NEDCo 107.5 million until 2021.
Expected Impact:	TBD

10.2.6 Operation and performance of ECG/PSP to meet KPIs and annual monitoring by EC and MoEn

ECG/PSP is expected to eliminate inefficiencies in the distribution system and enable PURC to develop a more effective tariff. This requires that ECG/PSP reduce losses in accordance with KPIs to be defined in the concession agreement. Compliance with these KPIs will be monitored and verified on an annual basis.

Expected Completion Date:	Annual basis
Responsible Party:	MoEn, EC
Budget Required:	None (To be provided by the concessionaire)
Expected Impact:	Compliance with KPIs and associated reduction in losses

10.2.7 Address excess take-or-pay generation capacity payments

Government to address excess take-or-pay generation capacity payments. Any actions taken by Government will be in accordance with national laws and existing contractual arrangements.

Expected Completion Date:	2019 - 2020
Responsible Party:	MoEn
Budget Required:	None identified
Expected Impact:	To be determined per restructuring discussions with Wholesale Suppliers.

10.2.8 Government to order finalization of the combined PPA review report on conventional and renewable projects

Government will ensure power supply equals demand to avoid unnecessary payments of excess supply and will do so while ensuring that the actions taken are in accordance with national laws and existing contractual arrangements. As such, Government will order a review, update and finalization of the combined report on thermal and renewable PPAs to be undertaken by the PPA Review Committee. This review will include a legal and financial analysis of each thermal and renewable PPA currently in the Government's

pipeline and any related agreements, permits or other documents. The combined report should be updated to align with the demand projections in the IPSMP. As a prerequisite, ECG and MoEn will ensure that the Pipeline PPAs and any associated agreements are made available to the ESTF and PPA Review Committee and their external legal and financial advisors in each case.

Expected Completion Date:	Q4 2019
Responsible Party:	EC, MoEn, ECG, Office of the Attorney General and MOF
Budget Required:	USD 200,000
Expected Impact:	Prevention of further deterioration in financial status of sector and potential capacity payment savings.

10.2.9 IPP power plant verification audit to ensure transparent billing by IPPs

EC, in coordination with PURC and MOF, will develop a robust procedure to obligate ECG to disclose and share all power and fuel supply invoices on a monthly basis for validation, including fuel availability, technical availability and veracity of all invoices. In order to ensure transparent billing by IPPs, EC will monitor the technical and fuel availability of power plants to prevent billing for unused capacity when the plant may not be available, including snap checks and verification by GRIDCo on the true status of plants. Procedures will be set up to implement routine capacity and availability tests of all power plants and an audit will be conducted to review all invoices presented to ECG over the past two years (2017 – 2019). Going forward, Restructured ECG will develop robust contract management procedures for all operations. Moreover, as part of its mandate to facilitate performance management in SOEs including implementation of individual performance contracts, the SIGA will conduct an annual performance review.

Expected Completion Date:	Ongoing
Responsible Party:	EC, PURC, MOF, SEC, GRIDCo
Budget Required:	None
Expected Impact:	Enhanced transparency and improved contract management at Restructured ECG.

10.2.10 Complete gas pricing actions to reduce the gas tariff

Government is considering several measures that would reduce the cost of delivering gas to the power sector and could underpin a regulated gas tariff reduction. Together these measures are expected to reduce the weighted average delivered cost of gas to power producers to USD 6 per MMBtu. To achieve this GNPC will meet the conditions and make effective the Memorandum of Understanding negotiated with the OCTP Sankofa private sponsors, to realize a price reduction of Sankofa gas from USD 10.39 per MMBtu to USD 8.08 per MMBtu. GNPC will restructure the Gas Sales Agreement with the OCTP Sankofa private sponsors to implement the Government decision to price the State Royalty and

GNPC share of gas production in OCTP Sankofa at USD 0 per MMBtu. Following these actions, Government expects an adjusted price to be determined and approved by PURC in 2019 Q3. [21]

Expected Completion Date: Q3 2019
Responsible Party: MoEn, GNPC, PURC
Budget Required: USD 300 million, MOU Payment
Expected Impact: USD 100 million per year

10.2.11 **Establish a revised gas tariff**

Government is considering several measures that would reduce the cost of delivering gas to the power sector and could underpin a regulated gas tariff reduction. Together these measures are expected to reduce the weighted average delivered cost of gas to power producers to USD 6 per MMBtu. To achieve this PURC review the methodology that defines which costs are allowable, how cost recovery will be assessed to reflect the actual cost of service, and how prices are differentiated for power and non-power customers. PURC will publish the assumptions and the formula to calculate the weighted average cost of gas and the service components of the tariff.

Expected Completion Date: Q3 2019
Responsible Party: MoEn, GNPC, PURC
Budget Required: None identified
Expected Impact: USD 100 million per year

10.2.12 **Institute regulations and tariffs on street lighting**

Currently, no measures exist to (i) measure street lighting consumption; and (ii) set tariffs for the provision of street lighting, this is an additional source of revenue shortfall in the sector. Draft "Regulations on Street Lighting" were developed by the Energy Commission and submitted to Cabinet for review in October 2018; however, these regulations are still under consideration. Cabinet will deliberate on the proposed "Regulations on Street Lighting" and approve any additional regulations required to regulate street lighting installation, operation, billing, payment, and maintenance. Parliamentary approval will be sought if appropriate. PURC will put in place a tariff methodology to set tariffs for street lighting. As metering for street lighting is installed, MOF will ensure that MDAs are provided with the required budget to pay for their electricity bills including allocations for street lighting.

Expected Completion Date: January 2020

[21] Government will also consider a decision to price the State Royalty and GNPC share in Sankofa and Jubilee gas at USD 0 per MMBtu and extension of the Offshore Cape Three Points Petroleum Agreement by 2 years to further reduce the blended commodity price.

Responsible Party:	EC/PURC/MoEn
Budget Required:	TBD – associated investments (sensors, meters, etc.)
Expected Impact:	USD 50 million per year

10.2.13 **Revise tariff methodology and rate setting guideline in line with Concession Agreement**

Transfer of the ECG operational rights to a private sector partner is subject to a number of conditions, including the implementation by PURC of a revised tariff methodology and gazetted tariff (including initial tariff rates the concessionaire is authorized to charge). PURC will complete and implement the revised tariff methodology and rate setting guidelines, which is expected to be published by the PURC by end of June 2019.

Expected Completion Date:	June 2019
Responsible Party:	PURC
Budget Required:	None
Expected Impact:	Fulfilment of conditions subsequent to complete transfer of the operational rights under the Concession Agreements.

10.2.14 **Amend the PURC Act or institute other regulatory measures to: (i) mandate disclosure of methodology, data, and analysis behind PURC regulatory decisions and (ii) prohibit approval of tariffs for projects not competitively bid**

The PURC is currently under no obligation to disclose the methodology, data or justifications behind its regulatory actions. In order to ensure transparency and predictability of the sector regulatory framework, an amendment to the PURC Act or other regulatory measures will be submitted to Parliament to require public consultation and disclosure of information and data pertaining to: (i) the processes for defining the PURC tariff methodology and periodically adjusting the revenue requirement of regulated service providers (including in each specific case where such methodology is applied); (ii) the PURC tariff setting methodology itself; (iii) tariff setting guidelines; (iv) the tariff regime; and (v) procedures for approving tariffs. In addition, the PURC Act will be amended to provide that PURC be prohibited from approving any tariffs or providing for the recovery of costs of power and gas supply contracts, unless such contracts were the result of a transparent and competitive bidding process in accordance with the policy for competitive procurement of energy supply and services contracts to be adopted by the Government as prescribed under 10.1.3.

Expected Completion Date:	2020
Responsible Party:	PURC
Budget Required:	None
Expected Impact:	Increased transparency and predictability in PURC tariff setting process.

10.2.15 **Review non-residential block tariff structure**[22]

Under the current rate structure, non-residential customers are being encouraged to leave the grid, which is resulting in lost revenue for the sector. PURC will review the tariff rate structure for non-residential consumers. PURC will also undertake a comprehensive electricity tariff reform including a review of the current tariff structure, cross-subsidization, and tariff methodologies and develop a path to full cost recovery.

Expected Completion Date:	July 2019; and quarterly application thereafter
Responsible Party:	PURC
Budget Required:	None identified
Expected Impact:	Prevents further deterioration of the SOE financial status

10.2.16 **Apply the Automatic Adjustment Formula (AAF) on a quarterly basis**

PURC has not consistently adjusted electricity tariffs through the application of the AAF formula, which has been one of the sources for revenue shortfall for SOEs. The PURC will adopt and implement a revised electricity tariff setting procedure, which will incorporate application of the AAF on a quarterly basis. PURC will publish the assumptions and formula used to apply the AAF.

Expected Completion Date:	July 2019; and quarterly application thereafter
Responsible Party:	PURC
Budget Required:	None identified
Expected Impact:	Increased transparency and accountability in the sector

10.2.17 **Publication of SOE Financial Statements**

Each of the following energy sector SOEs will be mandated to publish its annual financial statements: ECG, NEDCo, GNPC, GNGC, BOST, TOR, VRA, Bui Power Authority and GRIDCo. The SOE financial statements will be published within three (3) months following the end of each financial year and will be prepared in accordance with the accounting standards and associated policies set out in the PFM Act:

Expected Completion Date:	Annual
Responsible Party:	SOEs listed above.
Budget Required:	None
Expected Impact:	Increased transparency and accountability in the sector

[22] Strategic industries include aluminum, bauxite, iron, and steel industries

10.2.18 **Institutionalize an Integrated Planning Process based on 'Energy Supply and Infrastructure Plan' and Amendments to the Regulations to the PFM Act**

Lack of coordination between SOEs in planning has led to unrealistic or outdated assumptions which have had financial impacts on the energy sector. To improve coordination, EC will publish an updated SNEP, which will be expanded to include planning for all associated power and gas transmission infrastructure,[23] hereinafter "the Energy Supply and Infrastructure Plan". An 'outlook', which will include annual forecasts (for the current year and following year), will be published on an annual basis.[24] In terms of section 33 of the PFM Act, MDAs are required to first seek clearance from the MOF for their annual capital expenditure plans, including the implementation of all multi-year contract projects, to ascertain fiscal space and availability of funding for outer year commitments. MOF will consult with MoEn and EC to ensure that that such capital expenditure plan is aligned with the "Energy Supply and Infrastructure Plan" (including the Annual Outlooks) ahead of providing such clearance to any SOE. The Regulations to the PFM Act will be amended to require that MOF consult relevant sector Ministries and Regulatory Agencies ahead of granting clearance under section 33 of the PFM Act, to any SOE. Moreover, Energy Commission may not grant any license and PURC may not approve any tariff, unless MOF clearance has been provided and the relevant project has been authorized by MoEn and EC in line with the "Energy Supply and Infrastructure Plan".

Expected Completion Date:	EC to issue 'Energy Supply and Infrastructure Plan' by Q3/Q4 2019.
Responsible Party:	EC, MoEn, MOF
Budget Required:	None
Expected Impact:	Increased transparency and accountability in the sector.

10.2.19 **Review Power and Gas institutional responsibilities**

Government will launch a review to clarify the roles and responsibilities of institutions in the gas and power sectors. The review will make recommendations on the best arrangement for coordinated planning and improved management capacity, including gas aggregation and transportation.

[23] In terms of section 2 (2) (c) of the EC Act, the EC is mandated to prepare, review and update periodically indicative national plans to ensure that all reasonable demands for energy are met.
[24] SNEP to be reviewed to understand whether scope should be expanded or whether sufficient

Responsible Party: MoEn
Budget Required: None
Expected Impact: Increased transparency and accountability in the sector.

10.2.20 **Adoption of the Cash Waterfall or Other Appropriate Mechanism to increase payment transparency**

Government will pursue the implementation of a Cash Waterfall Mechanism (CWM) to achieve equity and transparency in disbursement of energy revenues from the electricity distributing companies. In addition to this, Government of Ghana will ensure equity from payment resulting from bulk and export customers and determine an appropriate mechanism to distribute this.

Responsible Party: MoEn, MOF
Budget Required: TBD
Expected Impact: Increased transparency and equity in the sector.

10.2.21 **Reduce technical losses and increase operational performance of electricity transmission infrastructure.**

Government will support GRIDCo to return to financial viability. In addition it will support GRIDCo to finance its medium term investment plan to reduce technical losses and increase transmission capacity of the national interconnected transmission system to enable increased power exports.

Responsible Party: GRIDCo, MoEn, MoF, PURC
Budget Required: USD 300 million
Expected Impact: TBD

10.3 **ESRP PHASE III:** Phase I and Phase II actions will considerably reduce the projected sector shortfall. However, additional measures could further close the financial gap in the medium-term and, therefore, lessen Government payments required to prevent additional arrears. Some options for further consideration that have been proposed are included below.

10.3.1 **Restructure VRA**

Government has announced plans to restructure VRA including divesting its non-core assets (schools, hospitals, hotels, etc.) and creating two operating companies, one for hydro assets and the other for thermal assets. Bui Power Authority (BPA) would be consolidated with the new hydro company, while the thermal company would seek private sector

participation. The GOG has hired *PwC* as Transaction Advisor to develop and implement a strategy to seek private sector investment of the thermal assets.

Responsible Party: MoEn

10.3.2 Improve Institutional and Regulatory Guidance for the Gas Sector

The current gas industry in Ghana is characterised by a number of institutions, agencies and organisations with overlapping and sometimes conflicting mandates. A review of the institutional and regulatory roles in the gas sector will be concluded with an eye to improve sector performance and to provide incentives to prospective investors. The existing natural gas regulations under the Gas Regulations, the Energy Commission Act, 1997, (Act 541) including Natural Gas Distribution And Sale (Technical And Operational) Rules, 2007 (LI 1911); Natural Gas Distribution And Sale (Standard of Performance) Regulations, 2007 (LI 1912); Natural Gas Transmission Utility (Technical And Operational) Rules, 2007 (LI 1913); Natural Gas Transmission Utility (Standards of Performance) Regulations, 2008 (LI 1936); Natural Gas Pipeline Safety Regulations, 2012 (LI 2189) and the Gas Access Code will be reviewed, and any amendments or need for additional legislation will be proposed to strengthen the sector.

Responsible Party: MoEn, Energy Commission

10.3.3 Enact Transparent Merit Order Dispatch

Continue steps leading to implementation of a wholesale electricity market within which GRIDCo would dispatch plants according to a transparent, least-cost, merit order dispatch to minimize the system wide variable operation costs.

Responsible Party: MoEn, EC, GRIDCo

10.3.4 Broaden analysis to include the petroleum sector

The analysis on the sector shortfall has thus far been limited to the power sector and components of the gas sector. The ESTF should expand the analysis to include the petroleum sector including but not limited to GNPC, GNGC, and TOR.

Responsible Party: MoEn, EC, NPA

10.3.5 Energy Sector Impact Analysis of Gas-Supply for Fertilizer

Government has plans for increasing non-power demand for gas such as domestic fertilizer production. The competitiveness of fertilizer production depends on the gas price and gas availability. Additional cost-benefit analysis is required to understand the trade-offs

between the benefits to the agriculture sector and local economies and the costs to the energy sector in terms of gas pricing.

Responsible Party: MoEn, EC, MoF, Ministry of Agriculture

11. IMPACT ANALYSIS - RESULTS OF FINANCIAL MODEL WITH ACTION ITEMS

11.1 **Phase I:** As result of Phase I Action Items, the Annual Sector Shortfall in 2023 would decrease from USD 2,571 million under BAU to USD 2,318 million. Key impacts of the Action Items identified under Phase I are:

- **MOF to Pay for Shortfall in MDA Electricity Bills**: Non-payment by MDAs account for about USD150 million in revenue shortfall on annual basis. MOF ensuring that MDAs are current on their electricity bill will reduce the revenue shortfall by the same amount.

- **Least Cost Fuel Procurement Strategy:** Once infrastructure is complete from 2019 Q4, the least cost fuel procurement strategy will result in cost savings of USD 103 million annually. The cost reduction comes from Karpowership switching from HFO to domestic natural gas.

11.2 **Phase II:** In addition to the identified actions under Phase I, Action Items in Phase II would further reduce the sector shortfall. As a result of Phase I and II Action Items, the Annual Sector Shortfall will decrease from USD 2,571 million to USD 589 million in 2023. Key impacts of the Action Items identified under Phase II are:

- **Address gas over-supply:** Address gas oversupply at an indicative assumed cost of implementation of USD 1,100 million, which will result in cost reduction of USD 1,400 million per year. In addition, ongoing discussions are being held to export gas, which may increase demand by 50 mmcfd.[25]
- **Rationalize excess capacity charges**: Indicative savings of USD 93 million per year in 2023[26].
- **Reduction of Gas Tariff to USD 6 per MMBtu**: As indicated in Phase II of the ESRP, through various measures, Government will reduce the composite delivered price of gas to USD 6 per MMBtu. This will reduce the costs to the power sector annually, amounting to USD 137 million per year by 2023.

- **Reverse Under-recovery of Gas Tariff**: The current gas pricing methodology of the gas composite price does not allow for full cost recovery of gas. The amendment of the gas pricing methodology to enable full cost recovery will reduce the sector shortfall by as much as USD 197 million per year in 2023.

[25] Assuming the gas will be exported at domestic regulated weighted-average cost of gas, the cost savings will amount to USD 160 million per year
[26] Amount is indicative only to illustrate the potential impact of reduced costs associated with restructuring PPAs which result in lower capacity charges.

- **Enact Tariff on Street Lighting**: The regulation and tariff methodology for street lighting expected to be in effect from 2020 onwards, which will clarify the responsible party for payment of the cost of street lighting. This will reduce the costs to the power sector annually, amounting to USD 64 million per year in 2023.

11.3 **Impact Analysis Conclusion:** Action Items identified in Phase I and Phase II are not enough to eliminate the sector shortfall by 2023. Phase III Action Items will be developed by the ESTF for urgent implementation to further reduce the sector shortfall. Government will prevent further accumulation of arrears through a combination of Sector Stabilization Payments and increasing sector revenue. Funding options are explored in the next section.

12. FUNDING THE SECTOR SHORTFALL AND REACHING FINANCIAL VIABILITY BY 2023

12.1 **Funding plan to prevent further accumulation of arrears:** Under the ESRP, Government will fund the sector shortfall on an annual basis to prevent accumulation of arrears, until the sector is Financially Viable. To fund the annual sector shortfall a combination of (1) electricity sector tariff increases, (2) Sector Stabilization Payments by Government, and/or (3) further Phase III Action Items are required. Government will consider options to fund the Sector Stabilization Payments, including annual allocation from the budget, resource mobilization through a tax or levy, lending to the sector to be recovered from the tariff in future years, or raising funds from capital markets.

Action Items in Phase I and Phase II are critical to reducing the Annual Sector Shortfall. After Phase I and Phase II Action Items are accounted for, however, the Annual Sector Shortfalls - though declining over time – remains as shown below.

Table 9. Annual Sector Shortfall

Energy Sector (Power & Gas)		2019	2020	2021	2022	2023
Power Sector Shortfall	US $ MN	1,034	1,093	1,110	1,024	1,002
Gas Sector Shortfall	US $ MN	241	520	962	1,261	1,569
Annual Energy Sector Shortfall	**US $ MN**	**1,275**	**1,613**	**2,072**	**2,285**	**2,571**
Legacy Debt as at 2018	US $ MN	2,748				
Accumulated Arrears	**US $ MN**	**4,023**	**5,636**	**7,708**	**9,993**	**12,564**

Completing Phase I and Phase II actions will reduce the Cumulative Sector Shortfall over the 2019-2023 time period by USD 5,540 million (i.e. from USD 12,564 million to USD 7,024 million). However, the sector shortfall is not eliminated with these policies alone. A combination of electricity tariff increases and/or Sector Stabilization Payments will also be needed to bring the sector back into balance by 2023 and prevent further accumulation of arrears.

Cumulative Sector Shortfall

Cummulative Shortfall		2019	2020	2021	2022	2023
Cummulative Shortfall BAU w/o Legacy Debt	US$ MN	1,275	1,613	2,072	2,285	2,571
Cummulative Shortfall BAU	US$ MN	4,023	5,636	7,708	9,993	12,564
Cummulative Shortfall Phase I	US$ MN	3,848	5,208	7,027	9,059	11,377
Cummulative Shortfall Phase I & II	US$ MN	3,775	5,078	5,807	6,435	7,024

NB: Legacy Debt is US$ 2,748 Million

12.2 **Business as Usual (BAU):** If Government were not to implement Phase I and Phase II Action Items (i.e. Business as Usual), Government would need to make Sector Stabilization Payments in the amount of USD 9,816 million between 2019 and the end of 2023. The sector shortfall would continue in the years beyond 2023.

12.3 **Implementing All Phase I and Phase II Actions:** The results of the BAU analysis demonstrate that Phase I and Phase II Action Items are needed to reduce the Annual Sector Shortfall. With these actions, the Government would need to make Sector Stabilization Payments in the amount of USD 4,276 million between 2019 and the end of 2023. The sector shortfall would continue in the years beyond 2023.

12.4 **Phase III Action Items:** The Energy Sector Task Force should continue to develop and evaluate additional Action Items to be undertaken as Phase III – that could further reduce the sector shortfall. Phase III Key Action Items should aim to reduce the size of the Sector Stabilization Payments by the Government and mitigate increases in electricity tariffs.

13. IMPLEMENTATION ARRANGEMENTS

13.1 **Implementation Timeline**: The ESRP contemplates three phases of implementation: a) Phase I activities are to be carried out concurrently with the adoption of the ESRP or immediately thereafter; b) Phase II activities are to be implemented within one (1) year of Cabinet approval of the ESRP, and c) Phase III activities should commence prior to the two (2) year anniversary of Cabinet approval. In an effort to minimize the quantum of Sector Stabilization Payments required by the GOG, the ESRP envisions a five year implementation horizon. However, the ESTF will monitor implementation and make adjustments as appropriate.

13.2 **Institutional Mandates/Responsibilities**: Successful Implementation of the ESRP will require robust governance and implementation arrangements, given the complex inter-agency dependencies of many of the ESRP Action Items. In accordance with the Action Item set out in Section 10.1.4, under Phase I of the ESRP, the ESTF will be formally established to facilitate the implementation, monitoring and evaluation of the ESRP. Responsibility for the creation, approval, implementation, monitoring, updating and periodic reporting (quarterly and annual) of the ESRP will be supervised by the ESTF, in close coordination with the Office of the Vice President, MOF and MoEn.

13.3 **Organization**: the ESTF will be a five member ministerial-level committee chaired by the Senior Minister and comprised of the Minister of Energy, Minister of Finance, Minister of Monitoring & Evaluation and an appointee-at-large by the President. The ESRP activities will be managed by an ESRP Coordinator who will report directly to the ESTF and be supported by technical advisors as required. It is anticipated that the Coordinator will initially supported by a policy expert and a financial/modeling expert. The Coordinator will also serve as the Chair of the ESRP Working Group, which will include representatives from MOEN, MOF, PURC, EC, GNPC and Office of the VP, and Office of the Senior Minister. The Working Group may be expanded from time to time to include representatives from Regulators (MoEn, EC, PURC, PC, and NPA) and SOEs (GNPC, GNGC, BOST, TOR, VRA, Bui Power Authority, GRIDCo, ECG, and NEDCo) to provide the necessary data and inputs requested by the ESTF.

13.4 **Monitoring, implementation and ongoing review**: The ESTF will be responsible for overseeing and facilitating the analytical work and reporting conducted by the ESRP Working Group under the direction of the ESRP Coordinator that is required to update and implement the ESRP on an ongoing basis. It is expected that ESTF deliberations will deepen the understanding of key issues and lead to new or improved options to reform the energy sector. The ESTF, through the ESRP Coordinator, will also provide this ongoing support and updated analysis and data to the MoEn and MOF including projected revenue shortfall and other financial and operational projections to ensure that the required budgeting and Action

Items will be taken within the ESRP Timeline. Support for the analytical work required to be conducted by the ESTF will be provided through consultancy services (including legal and financial advisory services) financed by World Bank's GESTIP TA Loan, as well as funds provided by USAID and other active donors in the sector.

13.5 **Reporting:** The ESTF will provide quarterly and annual reports to the EMT including feedback on the implementation status of the ESRP, each of the Action Items, and the associated financial impact on the sector. The ESTF will also be responsible for providing monthly reports to the EMT on the status of implementation of the ESRP and each of the Action Items.

13.6 **Access to information:** In order to deliver accurate and complete reporting, the ESTF will need to have the necessary data and inputs from each of the relevant sector SOEs provided to it upon request and in a timely manner. Government requires that all sector SOEs provide quarterly operational and financial information to the ESTF.

13.7 **Governance and Transparency Arrangements:** Improving transparency and accountability and strengthening sector governance will be the foundation for the successful implementation of the ESRP and its sustainability. An effective energy sector, that attracts investment while delivering good quality and cost-effective services, requires a high degree of transparency and rule-based, technical decision making, including transparent and predictable gas and electricity pricing, dispatch, and gas allocation.

In order to comply with the necessary governance standards required by this ESRP: (i) a substantial improvement in the financial and operational transparency in the sector will be required; and (ii) actions to enhance stakeholder engagement and communication with the public regarding the ESRP and its Action Items must be taken. These actions will include (but not be limited to) the following:

13.7.1 Publication of ESRP and its Reports: This ESRP will be published on the MoEn and EC websites along with any subsequent revisions and updates by the ESTF and all quarterly and annual reports prepared by the ESTF.

13.7.2 Financial and Operational Transparency: Action Item no. 10.2.12 in Phase II of the ESRP requires that PURC disclose its methodology, data, and justifications to its regulatory actions. In order to ensure transparency and predictability of the sector regulatory framework, an amendment of the PURC Act will be made to include a requirement to disclose all information related to tariff setting. This amendment will be submitted to the Parliament. In addition, each sector SOEs (including but not limited to GNPC, GNGC, VRA, ECG, BPA, GRIDCo, and NEDCo) will be required to publish its annual financial statements on its website in line with Action Item 10.2.17. Government also requires that

all SOEs provide quarterly operational and financial information to the ESTF to assist in its monitoring, implementation and reporting on the status of ESRP.

13.7.3 Stakeholder Engagement and Communication Regarding the ESRP: ESRP implementation will be strengthened through active engagement with key stakeholders, ranging from policymakers to sector operators and the wider public (civil society, media, private sector associations, and the public). MoEn will coordinate regular consultations to seek citizen and stakeholder feedback on the ESRP and disclose summaries of the public consultations held.

13.8 **Communication Plan including Stakeholder Engagement:** As perception of increasing risk and vulnerability of the financial status of the energy sector may lead to an increase in risk premium assigned to investments in Ghana, it is critical to have a comprehensive plan and a clear strategy communicated to investors and development partners. Reducing this risk perception through a clear, transparent and comprehensive program to restore the financial and operational stability of the energy sector would lead to lower input costs and increased appetite for investments in Ghana.

The ESRP serves as guideline for the energy sector SOEs and their management to follow in their corporate and investment strategy. The ESRP will be provided to all energy sector CEOs and MDs, Minister of Energy, Minister of Finance and Vice President, and presented by the ESTF at a one-day workshop. Each CEO/MD will be responsible for distributing the ESRP and instructions to implement such ESRP within their own organization.

Upon review by the legal teams within the MOF and MoEn, and redacted for any confidential or commercially sensitive information, the ESRP will be provided to energy sector stakeholders and civil society organizations for review and comments before evaluation and revising process for Phase II. During the consultative process of completing the Phase II of the ESRP, Government could also request assistance from DPs to finance some of the activities and capital expenditures required to implement the Program. This process will be repeated on an annual basis to track and monitor progress of the ESRP and update the ESRP as necessary based on changed assumptions and actual events.

Acceptance of the ESRP Action Items by sector stakeholders and the public will require a comprehensive communications strategy be put in place by the MoEn. This communication strategy will include (a) opinion research to assess public attitudes about reforms set out in the ESRP; (b) messaging workshops to design key campaign messages; (c) training sessions for journalists; and (d) media monitoring to enhance press coverage of reforms and development of an advertising campaign suitable for different media such as newspaper, radio, Internet, and television. This activity would be accompanied by training to build the capacity of the MoEn and the sector regulators to proactively communicate with the public as the sector continues to evolve.

13.9 **Legal Limitations:** No legal or administrative limitations or challenges have been identified to implement the ESRP or any of the Action Items contained herein. Certain Action Items will require Cabinet and/or Parliamentary approval prior to implementation; however, such approval will be coordinated to ensure the timely implementation of the relevant Key Action Item.

13.10 **Budget:** The operating budget for the initial two (2) years of the ESTF is proposed to be funded from the proceeds of the GESTIP USD 20 million loan facility from the World Bank. The estimated budget requirements are USD 150,000 per year. After the initial two years, funding will be included within the office of the Minister of Energy's administrative budget.

13.11 **Capital Expenditures:** Any capital expenditures or expense needed to implement the necessary Action Items to achieve the Financial Viability of the sector identified under the ESRP, which will be included into the reporting conducted by ESTF to the EMT, MoEn and MOF will need to be budgeted for appropriately.

13.12 **Role of Development Partners:** Given the extent of the reforms and actions required to bring the sector back into balance, as well as the desire to avoid burdening the Ghanaian rate and tax payer with the cost of implementing such reforms, Development Partners (DPs) can provide essential support for the successful implementation of the ESRP.

Many bilateral and multilateral DPs have developed interventions in the energy sector aimed at infrastructure development, improving efficiency and financial recovery. However, these interventions have in many instances ended in duplication of efforts and in some cases resulted in mixed results, as in many instances development partners seek to promote their own policies and markets for their exportable products and businesses.

ESRP would function as guideline to the DPs for which areas they should focus their resources and capacity building expertise to assist in implementation of the Program. On the other hand, ESRP would enable the DPs to monitor and track the progress on the reform agenda in a more transparent and open manner. The first step will be an active and open engagement through the consultation process as explained in the Communications section above.

Once ESRP is initiated, the ESTF will be directed to engage with the DPs as to prepare a DP Coordination Plan which identifies the priority actions and funding available and required from the DPs as well as a process to monitor the tasks and conditions precedent to such funding.

APPENDIX 1: INTEGRATED POWER SECTOR MASTER PLAN

Link to Executive Summary, Volume 1, and Volume 2

http://www.energycom.gov.gh/planning

http://www.energycom.gov.gh/files/Ghana%20Integrated%20Power%20System%20Master%20Plan%20_Volume%201_Executive%20Summary.pdf

http://www.energycom.gov.gh/files/Ghana%20Integrated%20Power%20System%20Master%20Plan%20_Volume%202.pdf