

**IN THE THIRD MEETING OF THE THIRD SESSION OF THE
SEVENTH PARLIAMENT OF THE FOURTH REPUBLIC**



PARLIAMENT OF GHANA LIBRARY

**REPORT OF THE JOINT COMMITTEE ON MINES AND ENERGY
AND FOOD, AGRICULTURE AND COCOA AFFAIRS**

ON THE

- i. EPC/TURNKEY CONTRACT AGREEMENT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF GHANA, ACTING THROUGH THE MINISTRY OF ENERGY, AND POWERCHINA INTERNATIONAL GROUP LIMITED FOR AN AMOUNT OF THREE HUNDRED AND SIXTY-SIX MILLION, AND ELEVEN THOUSAND, NINE HUNDRED AND NINE-ONE UNITED STATES DOLLARS AND THIRTY-EIGHT CENTS (US\$366,011,991.38) OF A 60MW HYDRO POWER PLANT IN PWALUGU.**

- ii. EPC/TURNKEY CONTRACT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF GHANA, ACTING THROUGH THE MINISTRY OF ENERGY, AND POWERCHINA INTERNATIONAL GROUP LIMITED, FOR AN AMOUNT OF FIFTY-FIVE MILLION, THREE HUNDRED AND SEVENTY-NINE THOUSAND, EIGHT HUNDRED AND EIGHT UNITED STATES DOLLARS AND SIXTY-SEVEN CENTS (US\$55,379,808.67) FOR A 50MW HYDRO POWER PLANT IN PWALUGU.**

- iii. EPC/TURNKEY CONTRACT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF GHANA, ACTING THROUGH THE MINISTRY OF FOOD AND AGRICULTURE AND POWERCHINA INTERNATIONAL GROUP LIMITED FOR AN AMOUNT OF FOUR HUNDRED AND SEVENTY-FOUR MILLION, AND FORTY-TWO THOUSAND, ONE HUNDRED AND FORTY-TWO UNITED STATES DOLLARS (US\$474,042,142.00) FOR A 24,000-HECTARE IRRIGATION SCHEME IN PWALUGU.**

20TH FEBRUARY, 2020

**REPORT OF THE JOINT COMMITTEE MINES AND ENERGY AND FOOD,
AGRICULTURE AND COCOA AFFAIRS ON THE ENGINEERING,
PROCUREMENT AND CONSTRUCTION (EPC) CONTRACT AGREEMENT
FOR THE PWALUGU MULTIPURPOSE DAM AND IRRIGATION PROJECT**

1.0 INTRODUCTION

- 1.1 The Contract Agreement between the Government of the Republic of Ghana, acting through the Ministry of Energy, Ministry of Food and Agriculture, and Powerchina International Group Limited for the Engineering, Procurement and Construction of a Multipurpose Dam & Irrigation Project consisting of 60MW Hydro Power Plant; 50MWac Solar Power Plant; and 24,000-Hectare Irrigation Scheme in Pwalugu was laid in Parliament by the Minister for Finance, Mr. Ken Ofori-Atta on Monday, 23rd December, 2019.
- 1.2 Pursuant to Article 103 of the Constitution and Order 169 of Parliament, the Rt. Hon. Speaker referred the Contract Agreement to the Committee on Finance and the Leadership of the Committees on Food, Agriculture and Cocoa Affairs for consideration and report.
- 1.3 However, the Rt. Hon. Speaker, having regard to the concerns raised by the House on the technical nature of the Contract Agreement and upon recommendation by the Majority Leader, on 7th February, 2020 referred the Agreement to the Joint Committee on Mines and Energy and Food, Agriculture and Cocoa Affairs to reconsider the Agreement and report to the House.
- 1.4 The Committee met on Thursday, 13th February 2020, and discussed the Agreements with Officials of the following institutions:
- i. Ministry of Food and Agriculture,
 - ii. Ghana Irrigation Development Authority,
 - iii. Ministry of Energy,
 - iv. Energy Commission: and
 - v. Volta River Authority.

The Committee is grateful for their assistance.

2.0 REFERENCES

The Committee referred to the following documents among others during its deliberations on the Agreement:

- i. The Constitution of the Republic of Ghana,
- ii. The Standing Orders of Parliament, and
- iii. Renewable Energy Master Plan

3.0 BACKGROUND

3.1 Between 2013 and 2018, the Ministries of Energy and Agriculture, with a funding support from the Agence Francaise de Development of France, undertook feasibility studies for the implementation of Pwalugu Hydropower Dam and Irrigation Project.

3.2 The study explored various options for providing all-year-round reliable water for irrigation and its sustenance, power supply as well as adequate protection against frequent floods for people living in the White Volta and Red Volta Basin. It was intended to permanently solve the annual flooding of many areas of northern Ghana as result of the spillages from the Bagre dam in Burkina Faso.

3.3 The Pwalugu Dam is to be located in the Talensi District of the Upper East Region. The Dam is expected to create a reservoir with an elevation of 165m above sea level, covering an area of about 265km² in six (6) districts in the Upper East and North East regions. The 24,000.00-hectare Irrigation component is to be located in the Mamprusi West district of the North East region.

The Irrigation Component of the project entails a composite weir, main canal, branch canals, canal structures, drainage systems, water level control and automation system, road network through the entire 25000ha irrigable area, and project administrative headquarters with at least two extension service post and agricultural mechanisation facilities.

- 3.4 The Government of Ghana intends to embark on this project as part of efforts to increase renewable energy mix in the national energy supply in order to reduce environmental impact of power supply, promote socio-economic development and contribute towards meeting Ghana's commitments under the Paris Agreements of the United Nations Framework Convention for Climate Change.
- 3.5 The implementation of the Project is also intended to mitigate the frequent floods in the Upper East and Northern Regions and its attendant effects.

4.0 PROJECT OBJECTIVES

- 4.1 The overarching objective of the Project is to contribute to the socio-economic development of the country through an improved, efficient and cost-effective irrigated year-long agricultural production and hydro power generation.
- 4.2 The main purpose of building the Dam is to store water for hydropower, for the irrigation scheme downstream, as well as flood protection for the people living in the White Volta Basin, and also improve the living conditions of citizens in the communities. Revenue from the Hydropower generation will therefore, ensure sustainable maintenance of the dam.

5.0 PROJECT COST AND FINANCING

- 5.1 The estimated cost of implementing the Pwalugu Multipurpose Dam and Irrigation Project is **USD 964,833,941.89**. The breakdown is provided in Table 1 and 2 below:

Table 1: Cost of Hydropower and Solar Projects

Item	Description	HPP	Solar
1	EPC Contract Sum	\$303,115,520.81	\$52,742,674.92
2	Contingency	\$45,467,328.12	\$0.00
3	Withholding tax	\$17,429,142.45	\$2,637,133.75
	Total EPC	\$366,011,991.38	\$55,379,808.66
4	Resettlement Cost	\$60,400,00	-
5	Owner's Engineer	\$9,000,000.00	-
	Grand Total for HPP & Solar	\$490,791,800.04	

Source: Joint Memo to Parliament by Hon. Ministers for Finance, Energy, and Food and Agriculture, page 7.

Table 2: Cost of Irrigation Project

Item	Description	Amount(US\$)
1	Cost of Works	385,724,590.96
2	Contingency	18,232,823.10
3	Withholding tax	69,284,727.79
4	EPC Contract Sum	473,242,141.85
	Other cost	
5	Cadastral Survey for land Acquisition	800,000.00
	Grand Total	474,042,141.85

Source: Joint Memo to Parliament by Hon. Ministers for Finance, Energy, and Food and Agriculture, page 7.

- 5.2 The actual cost of the EPC Contract Sum for the Hydropower is US\$ 116,765,963.34. The remaining sum of US\$186,349,557.47 relates to the reservoir /dam. Breakdown is attached as **ATTACHMENT 1**
- 5.3 The Multipurpose Dam and Irrigation Project will be funded through the national budget. In 2020, the Government has made a budgetary allocation of GH¢84,420,000.00, the equivalent of about US\$15Million for the implementation of the Project. Additionally, as part of the utilisation of the proceeds from the 2020 Eurobond, US\$75,471,698 has been allocated to the first year payment of the project cost. The repayment schedule is attached as **ATTACHMENT 2**.

6.0 OBSERVATIONS

6.1 Power Output and Off-taker

The Committee observed that the annual projected energy outputs from the hydropower plant and solar power plant are estimated at 176GWh and 96GWh respectively, at the cost of 9.3 Cent/kWh. In responding to the off-taker arrangement for the power and PURC tariffs approval, the Officials of the VRA indicated that discussions are still on-going on the options of selling it to NEDCo to reduce transmission losses and improve the quality of power supply in the north, selling to Mining Companies or export to neighbouring countries. It was confirmed that the Steel Mill at Sheini to process the iron ore would require at least

20MW and in view of that fact, the power generated shall have to dedicate a line to the iron and steel industry.

6.2 Compensation for Project Affected Persons

The Committee noted that a provision of US\$60,400,000 has been made to compensate for project affected persons under the Hydropower component of the project. The allocation is to take care of the following:

- a. Resettlement of 450 households comprising of about 20 communities;
- b. Construction of 18km asphalted access road;
- c. Provision of social amenities including schools, hospitals, potable water, chief's palace, etc.; and
- d. Compensation payment for crops on the affected lands.

On the other hand, it was observed that no similar arrangement has been established to take care of persons who may be affected under the Irrigation Development Scheme. The officials of the Ghana Irrigation Development Authority informed the Committee that they are yet to undertake the impact assessment and submit for the consideration of the government.

6.3 Local Content and Job Creation

The Committee was informed that the EPC Contractor for the hydro and solar power facilities had committed to employing over 2,000 skilled and unskilled Ghanaians during the construction of the hydropower dam. The construction of the camp buildings, new resettlement homes, common facilities, water and power supply infrastructure, landscaping and provision of security at the project site locations are to be subcontracted to local companies. Local supplies of construction materials such as cement, steel reinforcement bars etc. and fuel depots will equally benefit from purchases from contractors on the project.

6.4 Environmental Benefits

The Project marks a significant step towards achieving Ghana's Intended Nationally Determined Contribution (INDC) renewable energy target of 105MW by 2020 submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in September 2015.

The actions in the INDCs included increasing installed capacity of small to medium scale hydropower by 150-300 MW and utility scale solar by 150-250 MW by 2030. Accordingly, the Renewable Energy Master Plan (REMP) targets to increase utility scale solar generation from 42.5 MW in 2018 to 347.5 MW in 2025. The REMP also plans to increase small and medium scale hydropower to 80 MW by 2025.

6.5 Performance Security Guarantee

The Committee noted that a provision of 10% of the Contract sum has been placed as an obligation on the EPC Contractor to provide security to secure the fulfilment of its contractual responsibilities and liabilities. The security is essential for ensuring that the State (Ghana) does not incur financial burden in case of non-performance or breach of liabilities on the part of the Contractor.

6.6 Health and Safety

The health and safety of the EPC Contractor's personnel is very paramount considering the risky nature of the assignment. In this regard, the Committee noted with satisfaction, the provision made in the Agreement to safeguard the health and safety of the workers. The Contractor is required to collaborate with State institutions to ensure that medical staff, first aid facilities, sick bay and ambulance services are available at all times to take care of emergencies.

In addition, the Contractor is obliged under the Agreement to appoint an Accident Prevention Officer at the site whose sole responsibility is to maintain safety and prevent accidents. The Contractor shall also send periodic reports on all accident related cases to the government for appropriate actions to be taken.

6.7 Proposed mix of Commercial Farmers to Small Holder Famers

The Committee noted that one of the cardinal objectives of the project is to increase the income levels of farmers, particularly, the indigenes in the project area. However, the considered view of the Committee was that the proposed percentage mix of 70: 30 agro-industrial farmers (Commercial Farmers) to Small Holder Farmers may disadvantage the indigenes who are predominantly small holder farmers.

The officials of Irrigation Development Authority however indicated that in most cases small scale farmers default in payment of services including the use of water and the land. Therefore such arrangements are necessary to ensure the sustainability of the project. They further explained that the 30% translate into about 8,000 hectares which is large enough to accommodate reasonable number of small scale farmers whose farm sizes average one acre.

6.8 Comparative Investment Cost in Hydropower Projects

It was observed that the estimated investment cost of US\$1,946,099.389million per MW for the Pwalugu hydropower plant compares favourably with industry benchmark for small hydro plants of US\$1,300 - US\$1,800 per kW (US\$1.3 – US\$8.0 million per MW) (Table 1). Admitting that the geographical location of hydropower plants is a key determinant of investment costs, the Officials of the Ministry indicated that average cost of hydropower projects across the world has shown that large hydropower plants with installed capacity higher than 100MW tend to have lower cost than small and medium plants such as the Pwalugu Dam of an installed capacity of 60MW.

Table 3: Typical Installed Cost of Hydropower Projects

	Installed Costs (USD/kW)	Operations and maintenance costs (%/year of installed costs)	Capacity factor (%)	Levelised cost of electricity (2010USD/kWh)
Large hydro	1,050 – 7,650	2 - 2.5	25 to 90	0.02 – 0.19
Small hydro	1,300 – 8,000	1 - 4	20 to 95	0.02 – 0.27
Refurbishment/up grade	500 – 1,000	1 - 6		0.01 – 0.05

Source: Renewable Energy Technologies: Cost analysis Series –Hydropower (International Renewal Energy Agency, 2012)

6.9 Contingency Fund

The Committee was concerned about a provision of \$45,467,328.12 and \$18,232,823.10 as contingency fund for the hydropower and the irrigation development projects respectively. The officials explained that considering the complex nature of the project, it is imperative to make adequate provisions to take care of unforeseen circumstances which are typical of such projects. Having adequate contingency fund will avert possible project implementation delays and cost variations. The amount represents 15% of the project cost which conforms to international best practices.

6.10 Procurement of the EPC Contractor for the Project

The Committee observed that Public Procurement Authority has given approval for the award of the contract by sole sourcing. In responding to why sole sourcing was being employed, the Officials of the ministry indicated that a work done by Tractebel Engineering S. A (located in France) in respect of sole sourcing as opposed to competitive tendering process, revealed that the maximum savings from competitive tendering process is likely to be around US\$20 million, an amount which is much lower than the loss associated with the delay in commissioning the project due to the tendering process which could take about a year to complete.

According to the Officials of the ministry, the total direct loss attributable to loss of sale of one year energy generation of 200GWh and other economic benefits associated with the irrigation, flood protection, fisheries and water access is valued at US\$40million. This total value does not indirect economic benefits associated with the project to the country.

6.11 Comparative Cost Analysis of the Irrigation Project

The Committee observed that the cost per hectare of US\$18,930.00 charged for the irrigation project compares reasonably with similar projects executed in other countries such as Syria, India and the Republic of Korea (see Table 4).

Table 4: Comparative Irrigation Project Cost per Hectare

No.	Country	Name of Irrigation Project	Cost per Hectare (USD)	Year
1.	Korea	Yongsan Gan Irrigation Project	24,151.58	1973
2.	Syria	Balial Irrigation Project	23,539.60	1975
3.	India	Kallada Irrigation and Tree Crop Development Project (12,600 ha, gravity)	11,880	2000
4.	Tanzania	Ksitivo & Mwamapuli Scheme (907 ha, gravity)	18,103	2000
5.	Zimbabwe	Mwarazi Scheme (410 ha, pumped)	17,647	2000
6.	Sub-Saharan Africa	Average Cost	14,455	2005
7.	Ghana	Kpong Left Bank Rehab., (2036 ha, Gravity)	16,000	2017
8.	Ghana	Pwalugu Irrigation Project (25,000ha, Gravity)	18,930	2019

Source: Ghana Irrigation Development Authority

The Officials of the Ghana Irrigation Authority explained that gravity lined canal irrigation schemes such as the Pwalugu Irrigation Project are often more expensive than pump-based sprinkler system and drip irrigations system.

They further indicated that despite the relatively higher initial capital outlays, the gravity irrigation scheme is cheaper and more sustainable in the long term, because, it does not require farmers to pay for electricity to pump water to irrigate their farms. Studies have also shown that the gravity irrigation projects last longer.

6.12 Withholding Tax

It was observed that an amount of US\$69,284,727.79; \$17,429,142.45 and \$2,637,133.75 has been included in the project costs as payment for withholding taxes for the irrigation, hydropower, and solar projects respectively. However, withholding tax is an income tax to be paid to the government and not the recipient of the income.

Therefore payment of withholding tax to the Contractor will be an anomaly considering that the project is being funded by the government of Ghana. Indeed, a Deputy Minister of Finance admitted that, that element must be a mistake. Accordingly, the Committee recommends to the House to reject the line item on withholding tax and called for a deduction of the said amount from the total cost of the projects.

7.0 CONCLUSION

The Committee, having thoroughly scrutinised the technical details of the EPC Contract for the Pwalugu Multipurpose Dam and Irrigation Project, is satisfied that the projects offer enormous benefit to the State, particularly in contributing to the “Planting for Food and Jobs programme” and subsequently, the “1 District 1 Factory programme” as well as enhancing the power generation needs of the country. It will also help to alleviate the perennial flooding as a result of the yearly Bagre dam spillage.

The Committee accordingly recommends to the House to adopt its report and approve by Resolution the:

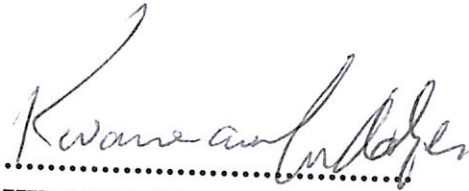
- i. EPC/Turnkey Contract Agreement between the Government of the Republic of Ghana, acting through the Ministry of Energy, and Powerchina International Group Limited for an amount of Three Hundred and Sixty-Six Million, and Eleven Thousand, Nine Hundred and Nine-one United States Dollars and Thirty-Eight Cents (US\$366,011,991.38) of a 60MW Hydro Power Plant in Pwalugu.
- ii. EPC/Turnkey Contract between the Government of the Republic of Ghana, acting through the Ministry of Energy, and Powerchina International Group Limited, for an amount of Fifty-Five Million, Three Hundred and Seventy-Nine Thousand, Eight Hundred and Eight United States Dollars and Sixty-Seven Cents (US\$55,379,808.67) for a 50MW Hydro Power Plant in Pwalugu.

- iii. EPC/Turnkey Contract between the Government of the Republic of Ghana, acting through the Ministry of Food and Agriculture and Powerchina International Group Limited for an amount of Four Hundred and Seventy-Four Million, and Forty-Two Thousand, One Hundred and Forty-Two United States Dollars (US\$474,042,142.00) for a 24, 000-Hectare Irrigation Scheme in Pwalugu, in accordance with Article 181 of the 1992 Constitution of the Republic of Ghana subject to the Committee's recommendation numbered 6.12 under the sub-heading "Withholding Tax".

Respectfully submitted



.....
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CHAIRMAN, MINES AND
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AFFAIRS

DATE: 20TH FEBRUARY, 2020.

Payment Schedule

Project	Total EPC COST	2020	2021	2022	2023	2024	2025
Irrigation	474,042,142	21,731,067.35	211,036,567.33	183,536,508.33	56,855,070.00	882,929.00	
Hydropower Dam/Solar Hybrid	490,791,800.05	69,668,932.65	113,793,398.98	104,476,165.82	89,380,594.25	84,525,677.88	28,947,030.47
Total	964,833,942.05	91,400,000.00	324,829,966.31	288,012,674.15	146,235,664.25	85,408,606.88	28,947,030.47
Source of Funding		GOG 15,928,301.9	GOG	GOG	GOG	GOG	GOG
		2020 Eurobond= 75,471,698					

Source: Joint Memo to Parliament by Hon. Ministers for Finance, Energy, and Food and Agriculture, page 8.

ATTACHMENT 1

Price Breakdown

Item	Section of Works	Unit	Total Price(US\$)
1	Contract Inception Cost	Isum	2,242,989.05
2	Camps & Contractor's Facilities	Isum	7,778,039.10
3	Employer & Engineer's Camp (Temporary Camp)	Isum	2,755,266.00
4	Stationary Plants	Isum	9,312,803.29
5	Access roads (Temporary and Final Roads)	Isum	15,077,191.51
6	Bottom Outlet Arrangement	Isum	10,138,810.23
7	Diversion cofferdams	Isum	8,615,172.89
8	Embankment dam	Isum	68,005,830.51
9	RCC Dam	Isum	3,280,995.31
10	Spillway	Isum	27,526,031.40
11	The side wall between the concrete dam and the earth-rock dam	Isum	17,271,844.27
12	Instrumentation	Isum	393,093.55
13	Coordination - Internal Transport - Services for Item 17-18	Isum	377,921.16
14	Engineering	Isum	7,161,437.20
15	Flyash for alkali reaction control	Provision Sum	3,500,000.00
16	Health, Safty and Environmental cost	Isum	2,912,130.00
	Dam Related Costs		186,349,557.47
17	Powerhouse & Tailrace channel	Isum	14,965,265.36
18	Electro Mechanical and Electrical Works (including equipment and installation)	Isum	66,419,385.34
19	Switchyard Civil Works	Isum	1,017,951.43
20	Hydromechanical Works (including hoisting systems and control)	Isum	16,503,176.62
21	Spare Parts	Isum	1,115,078.28
22	RCC Dam for Powerhouse	Isum	8,342,585.91
23	Employer & Engineer's Camp (Permanent Accomodation)	Provision Sum	8,402,520.40
	Powerhouse related Cost		116,765,963.34
	Sub-Total		303,115,520.81
	Contingency cost (15%)	Provision Sum	45,467,328.12
	Tax (only including withholding tax, 5%)	Isum	17,429,142.45
	Total		366,011,991.38

61%

39%