

Good Governance for PPPs for the Transformation of the Energy System in West Africa

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1. Introduction

While forecasts made by the African Development Bank (AfDB) in 2016 were claiming West Africa as the second fastest-growing sub-region within the African continent after East Africa, with an expected real GDP growth of 4.3% in 2016 and + 5.5% in 2017 (AfDB, 2016)¹, most recent data show that last year's predictions were too optimistic: West Africa's GDP growth was only by 0.4% in 2016², the worst sub-region result in the African continent. GDP growth projections for 2017 scaled down to a +3.5% in West Africa, while a +5.5% is foreseen for 2018 (AfDB, 2017).

Projections for the region report that energy demand growth falls from more than 3% per year since 2000 to around 2% per year in the period 2015-2040. Nevertheless, due to other crucial factors other than growing population – i.e. economic expansion, increasing urbanisation, industrialisation and modernisation – the demand for primary energy in West Africa is expected to grow to 355 million tonnes of oil equivalent (Mtoe) by 2040, while forecasts for electricity demand in the region foresee an increase to 417 TWh by the same year with a CAGR of 7.1% according to the IEA New Policies Scenario (IEA, 2014).³

Ghana, with a 7.1% of real GDP growth expected for 2017 (AfDB, 2017) and a GDP per capita of 1,480 USD⁴ is one of the leading economies of Western Africa, able to attract the biggest share of Foreign Direct Investments (FDI) among West African countries: **2.5 billion USD in 2015** (AfDB, 2016). Electricity demand is growing annually by around 10% and is estimated to reach around 24,000 GWh by 2030 (IRENA, 2015)⁵ or to fall within 20,453 and 34,867 GWh by the year 2020 (Adom, P.K., Bekoe, W., 2012). A few studies⁶ state that in Ghana it exists a long-run equilibrium relationship between electricity consumption and economic growth, and that economic growth leads to electricity consumption. More in detail, the results show that 'the historical growth trends experienced in domestic electricity demand is explained by the positive income, structural changes, and urbanisation effects which more than offset the negative efficiency effects' (Adom, P.K., Bekoe, W., 2012; Adom, P.K., 2011).

In Ghana 78% of the population has reached access to electricity in 2014 – the highest share in West Africa – with a 90.8% peak in urban areas, and the renewable energy share in the total final energy consumption stood at 45.22% in 2014 (WB, IEA, 2017), almost all out of hydropower generation⁷. However, Ghana is characterized by inadequate electricity supply and frequent power outages (more than 600 hours per year according to IEA analysis)⁸ that have both direct and indirect effects on utilities, companies and the whole economy as a whole. About half of Ghana's 161-kilovolt (kV) transmission infrastructure, which has been operating since the 1960s, is long past its recommended retirement age. Ghana's transmission system needs a significant amount of investment to offset the underinvestment of the past decade.

¹ AfDB, OECD, UNDP (2016), African Economic Outlook 2016

² AfDB, OECD, UNDP (2017), African Economic Outlook 2017

³ International Energy Agency (2014), Africa Energy Outlook 2014

⁴ Se4ALL Global Tracking Framework 2017, Progress toward Sustainable Energy 2017

⁵ IRENA (2015), Ghana Renewables Readiness Assessment, November 2015

⁶ Adom, P.K., Bekoe, W., (2012) Conditional Dynamic Forecast of electrical energy consumption requirements in Ghana by 2020; Adom, P.K., (2011), Electricity Consumption-Economic Growth Nexus: The Ghanaian Case

⁷ In 2015 Ghana's electricity generation was 11,492 GWh, almost equally divided between hydro (5,845 GWh) and thermal generation (5,644 GWh). Energy Commission of Ghana (2016), Ghana Energy Statistics 2006-2015

⁸ International Energy Agency (2014), Africa Energy Outlook 2014

According to the WEF Global Competitiveness Index, Ghana Infrastructure Score - being a component of the overall index and covering electricity, telephony and transport infrastructure, is as low 2.9 (over 7) and the quality of electricity supply being even worst at 2.2, positioning Ghana in a low ranking position (126 over 140).⁹ Within this framework, huge capital investment is required to meet the energy infrastructure needs of a fast-growing population in Ghana (+2.4% per year in 2010-2015, UNDESA) expecting to reach 40 million in 2035¹⁰ and with around 7 million people today not provided with access to electricity.

Important investment need is also required to comply with the Intended Nationally Determined Contribution (INDC) under the Paris Agreement. Ghana has committed to take actions focused to scale up renewable energy penetration by 10% by 2030 (through wind, solar, small-medium hydro and distributed generation) and to double energy efficiency improvement to 20% in power plants, with the aim of scaling up 120 MSCF (million standard cubic feet) natural gas replacement of light crude oil for electricity generation.¹¹ This two actions combined imply a **total investment need of almost 3,500 USD million by 2030**, and the effects would likely generate a reduced consumption of fossil fuel for power generation, as well as an increased electricity access to rural communities and a significant contribution to realize energy security. Nonetheless, there would be an electricity demand saving of about 200MW (Government of Ghana's INDC, 2015).

If in the whole African continent a bigger participation of private business is widely beneficial and considered a decisive leverage for economic growth, Ghana makes no exception. The country is slightly increasing its attractiveness for private investors through the establishment of Public-Private Partnerships (PPPs) for infrastructure projects in the energy, telecommunication and transport sectors. Today in Ghana a total investment of **3,280 USD million** has been spent in PPP energy infrastructure projects since 1990 (as of 2014), and the majority of them are greenfield projects.¹²

2 Governance of Energy Transformation in Ghana

2.1 Strong Institutions: key for Infrastructure Investment

It is acknowledged that weak laws can foster red tape and corruption, diverting scarce resources from development to other uses and undermining socio-economic development. On the other hand, lower level of corruption and more effective rule of law are associated with more PPP projects (Hammami et al., 2016).¹³

Araya et al. (2013)¹⁴ analyzed the relationship between country risk and private participation in infrastructure development, and Mengistu (2013)¹⁵ investigated the determinants of private

⁹ WEF (2016), The Global Competitiveness Report 2016-2017

¹⁰ World Bank, Population Estimates and Projections, <http://datatopics.worldbank.org/hnp/popestimates#> - Last access on 27/06/2017

¹¹ The Republic of Ghana (2015). Ghana's intended nationally determined contribution (INDC) and accompanying explanatory note

¹² <https://ppi.worldbank.org/snapshots/country/ghana> - last access on 3/07/2017

¹³ Hammami M., Ruhashyankiko J.F., Yehoue E. B. (2006), Determinants of Public- Private Partnerships in Infrastructure, IMF working paper, WP/06/99, International Monetary Fund.

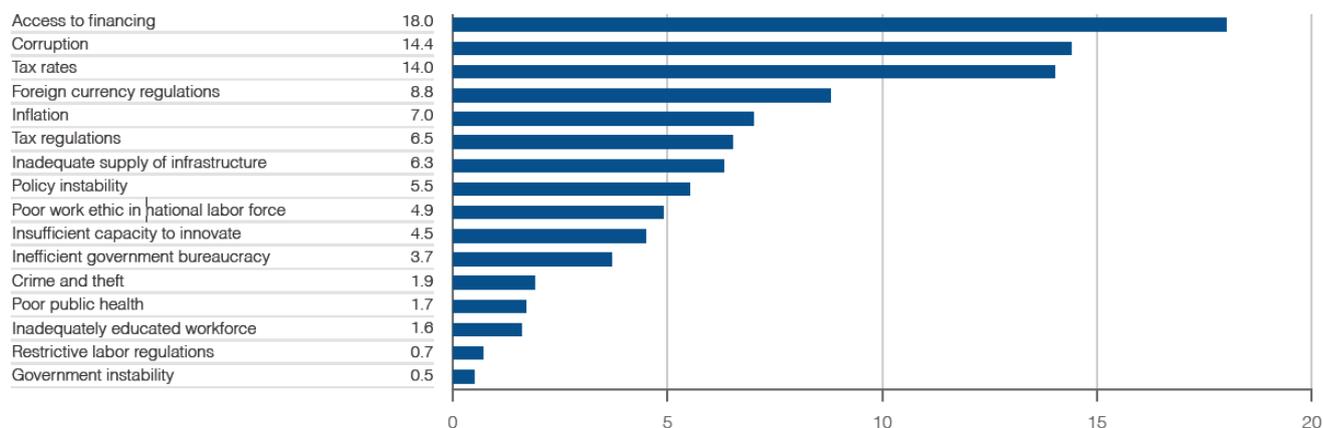
¹⁴ Araya G., Schwartz J., Andrés L., 2013, 'The Effects of Country Risk and Conflict on Infrastructure PPIs', World Bank Policy Research Working Paper No 6569

participation in infrastructure (PPI) comparing Sub-Saharan Africa (SSA) with low- and middle-income countries (LMICs). The latter study finds that private participation in infrastructure investment in LMICs is determined by expected factors, whereas in SSA it appears to be sub-optimally allocated. In particular, when it comes to larger PPI investments the findings suggest that corrupt countries with inefficient governments seem to attract more PPI infrastructure.

Another study by Gasmi et al. (2010)¹⁶ assesses the extent to which the level of development of financial sector is a determinant of private investment in the power sector in 37 developing countries. The results suggest that investors tend to take countries' governance quality into account in their decisions to invest. The empirical results highlight that the development of the financial sector also plays a significant role in private investors' decisions to enter infrastructure sectors.

According to the WEF Global Competitiveness Index, the score of **strength of investor protection** in Ghana is 5.7 out of 10. Moreover, an Executive Opinion Survey conducted by WEF in 2016 highlighted the most problematic factors for doing business in Ghana. The first one being considered the **access to financing**, followed by corruption, tax rates, foreign currency regulations and only at the 7th position is the inadequate supply of infrastructure followed by policy instability (Figure 1).¹⁷

Figure 1: Ghana's most problematic factors for doing business



Source: World Economic Forum, Executive Opinion Survey 2016

If we consider the 2030 Agenda and its **SDG 16**, the most representative indicator being the **Corruption Perception Index**, Ghana is the second worst decliner in the 2016 Transparency International Corruption Perceptions Index in the African region.

¹⁵ Mengistu, Tewodaj (2013). Determinants of Private Participation in Infrastructure in LMICs, Pardee RAND Graduate School.

¹⁶ Gasmi F., Lika B., Numba Um P., 2010, Is the Level of Financial Sector Development a Key Determinant of Private Investment in the Power Sector?, TSE Working Paper Series.

¹⁷ WEF (2016), The Global Competitiveness Report 2016-2017

Ghana declines to the 70th position in the 2016 index with a score of 43 compared to a score of 47 in the previous year index (Figure 2).¹⁸ Ghana is at the ninth position among Sub-Saharan African countries and in the third position in West Africa, after Senegal and Cape Verde.

Figure 2: Corruption Perception Index Ranking 2016 in Sub-Saharan Africa

2016 Rank	Country	2016 Score	2015 Score	2014 Score	2013 Score	2012 Score	Region
35	Botswana	60	63	63	64	65	Sub Saharan Africa
38	Cape Verde	59	55	57	58	60	Sub Saharan Africa
50	Mauritius	54	53	54	52	57	Sub Saharan Africa
50	Rwanda	54	54	49	53	53	Sub Saharan Africa
53	Namibia	52	53	49	48	48	Sub Saharan Africa
62	Sao Tome and Principe	46	42	42	42	42	Sub Saharan Africa
64	Senegal	45	44	43	41	36	Sub Saharan Africa
64	South Africa	45	44	44	42	43	Sub Saharan Africa
70	Ghana	43	47	48	46	45	Sub Saharan Africa
72	Burkina Faso	42	38	38	38	38	Sub Saharan Africa
83	Lesotho	39	44	49	49	45	Sub Saharan Africa
87	Zambia	38	38	38	38	37	Sub Saharan Africa
90	Liberia	37	37	37	38	41	Sub Saharan Africa
95	Benin	36	37	39	36	36	Sub Saharan Africa

Source: Transparency International, Corruption Perceptions Index 2016

2.2. Public Private Partnerships in Ghana

2.2.1. Legal and Institutional PPP Framework

In Ghana the leadership on PPPs is very fragmented and the large number of stakeholders involved slows down infrastructure project development. PPPs capacity within the Government is limited, restricting the ability to progress the pipelines of projects that are potentially bankable.¹⁹

In recent years Ghana has growing PPP experience PPPs but lacks a comprehensive legal framework. The country does not have a standalone PPP Law (a draft PPP bill is currently under review²⁰) and procuring PPPs is allowed under the 2011 **National Policy on Public Private Partnerships** (the "PPP Policy"). The PPP Policy sets out some guidelines for the interim regulation of PPPs pending the enactment of the Ghana Public-Private Partnerships Bill. However, the PPP Policy is not an act of Parliament and, therefore, it is not binding although it is the policy that guides PPPs in Ghana.

¹⁸ https://www.transparency.org/news/feature/corruption_perceptions_index_2016#table

¹⁹ www.mofep.gov.gh

²⁰ http://www.mofep.gov.gh/sites/default/files/docs/pid/PPP_Law_Draft%20.pdf

The World Bank is supporting the Government to prepare the legal framework and administrative system for the implementation of PPPs. The Bank has provided Ghana an amount of **USD 30m interest free credit over a four-year period** (2012-2016) for capacity building with the aim of setting up a comprehensive programme to fully implement PPP projects from 2017.²¹ However, the WB International Development Association (IDA) credit has failed to hire the needed sector experts and its progress is considered unsatisfactory.²²

The program put in place by the Public Private Infrastructure Advisory Facility (PPIAF)²³ has the objective to help the Government of Ghana facilitate long-term financing for infrastructure by establishing a well-structured Infrastructure Investment Fund that creates access to long-term financing by crowding-in private sector sources to support infrastructure and PPP projects. In 2014 the **Ghana Infrastructure Investment Fund Act** (the Act 877)²⁴ is passed establishing the Fund, wholly owned by the Government of Ghana.

The 2013 draft bill is in line with international standards and consistent in terms of PPP binding processes, although it is less advanced in post-contract enforcement and does not foresee any dispute resolution settlement. However, **the absence of an effective legal framework for PPPs has been of major concern to investors in Ghana.**

An additional challenge for PPPs infrastructure investment in Ghana concerns the imbalance at the institutional level between the Public Investment Division of the Ministry of Finance, which centralizes skills, and the broader public stakeholders and contracting authorities. This is shown in Figure 4 where Ghana is at the 9th position in the institutional framework category of the PPP Framework Index elaborated by the Economist Intelligent Unit assessing the capacity of countries to carry out sustainable PPPs in infrastructure in Africa (Figure 3).

Figure 3: Overall PPP Framework Index in Africa

²¹World Bank. 2015. Ghana - Public Private Partnership Project: procurement plan. Washington, DC at <http://documents.worldbank.org/curated/en/835251468030863977/Ghana-Public-Private-Partnership-Project-procurement-plan>

²² Cambridge Economic policy Associates Ltd., Mobilising Finance for infrastructure: a study for the UK DFID, Ghana country case study, August 2015

²³ The Public Private Infrastructure Advisory Facility (PPIAF) is a multi-donor technical assistance facility that is financed by 11 multilateral and bilateral donors. Established in 1999 as a joint initiative of the Governments of Japan and the United Kingdom, working closely with and housed inside the World Bank Group, PPIAF is a catalyst for increasing private sector participation in emerging markets.

²⁴ <https://s3.amazonaws.com/ndpc-static/CACHES/NEWS/2015/07/22//GIIF+Act+2014+Act+877.pdf>

MATURE (80–100)		DEVELOPED (60–79.9)		EMERGING (30–59.9)		NASCENT (0–29.9)	
Rank						Score	
1	South Africa					70.7	
2	Morocco					51.8	
3	Kenya					51.4	
4	Egypt					51.0	
5	Tanzania					48.6	
6	Côte d'Ivoire					45.5	
7	Tunisia					45.4	
8	Uganda					45.1	
9	Rwanda					43.5	
10	Ghana					43.0	
11	Cameroon					38.2	
12	Nigeria					36.8	
13	Zambia					34.2	
14	Angola					31.4	
15	Democratic Republic of the Congo					20.6	

Figure 4: Ghana's score across all considered indicators

	Score	Rank
OVERALL SCORE	43.0	10
1) REGULATORY FRAMEWORK	50.0	=6
2) INSTITUTIONAL FRAMEWORK	41.7	9
3) OPERATIONAL MATURITY	34.4	=9
4) INVESTMENT CLIMATE	58.1	=5
5) FINANCIAL FACILITIES	38.9	=6
6) SUBNATIONAL ADJUSTMENT	25.0	=8

Source Figures 3 and 4: EIU, 2015.

2.2.2 Private sector participation in the energy sector

A **Renewable Energy Act** (Act 832) was adopted in 2011 to provide fiscal incentives and regulatory framework **to encourage private sector investment** in Ghana. The Law includes a Feed-in Tariffs (FiT) system, a RE Purchase Obligations (RPO), net metering, a Renewable Energy Fund (RE Fund), and a Renewable Energy Authority (REA). Of these provisions the RE Fund is yet to be operationalized and the REA is yet to be established.

Ghana has reached 78% electricity access rate²⁵ leaving only a relatively small proportion of communities and households still needing to be connected. On the off-grid side, the main objective of mini-grid development is that people in remote communities should gain access to electricity.

²⁵ SE4ALL, Global Tracking Framework, 2017

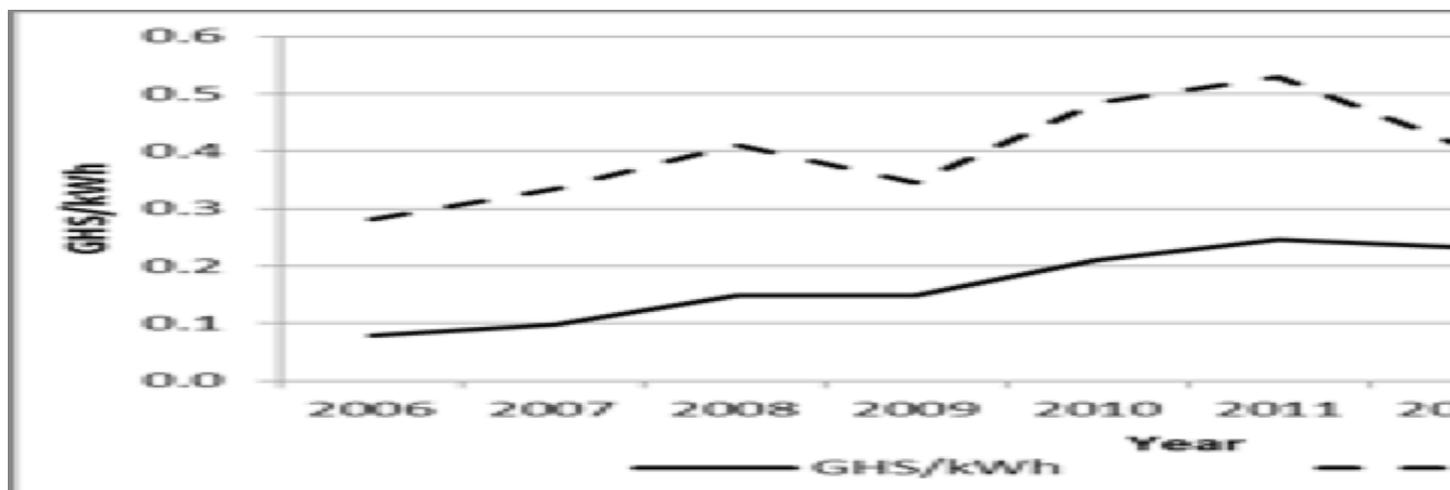
They need **private entrepreneurs** to be prepared to provide electricity to their communities. The experience of other countries, notably **Tanzania**, has shown that a light-handed approach to mini-grid regulation is adequate for protecting the interests of customers in terms of reliability of supply and affordability. **Heavy-handed regulation could put off the private sector altogether.**

In 2010 Ghana has achieved compliance with the **Extractive Industries Transparency Initiative (EITI)**, the global standard for improved transparency in the oil, gas and mining sectors. Ghana EITI will in the coming year be working together with stakeholders on the practical issues related to collecting and disclosing the names and other details of companies' real owners. **The "Company Act" of 1963 was amended in 2016 paving the way for a beneficial ownership disclosure regime in Ghana.**

2.3. Electricity tariffs and incentives scheme

If the average power tariff in Africa is USD 0.12 per KWh, in 2012 the average end-user electricity **tariffs in Ghana were among the lowest in Africa at USD 0.012 per KWh (PURC 2011)**²⁶. In 2013, PURC approved a tariff increase of 78.9% (Figure 5). Until 1998, the generation of electricity in Ghana was exclusively from relatively cheap hydroelectric sources. Ghana's traditional reliance on old hydroelectric plants has led to consumers, regulators and politicians becoming used to **very low electricity prices**. The addition of new thermal units has pushed prices up although not enough to cover all costs. The current Transmission Service Charge (TSC) is also considered insufficient to allow the national TSO - GRIDCo to recover its fixed and variable costs and provide a ROI.²⁷

Figure 5: Trend in Ghana average electricity end-user tariff (2006 – 2015)



Source: ECG, National Energy Statistics 2006 – 2015²⁸

²⁶ PURC (2011), Publication of Electricity and Water Tariffs in the Gazette

²⁷ Tariffs are composed of three parts: the Bulk Generation Charge (BGC) paid to generators, the Transmission Service Charge (TSC) paid to the transmission system operator GRIDCo, and the Distribution Service Charge (DSC) paid to distribution companies – Electricity Company of Ghana Limited and Northern Electricity Distribution Company Limited (NEDCo).

²⁸ Energy Commission of Ghana, National Energy Statistics, 2006 – 2015, April 2016, at http://energycom.gov.gh/files/National%20Energy%20Statistics_2016.pdf (retrieved on 28 June 2017)

At the end of 2015, PURC **increased further tariffs for electricity by 59.2%** to service the debt of the state-owned enterprises and in a renewed bid **to attract competitive private investment**.

The **Feed-in Tariff scheme** consists of a renewable energy purchase obligation, a FiT rate and a connection to transmission and distribution systems. FiTs for renewable generation were first published by the PURC in 2013, and then reviewed and considerably increased in the Ghana Gazette in 2014 (Table 1), and further reviewed in the Ghana Gazette in 2016 (Table 2).

Ghanaian FiT scheme is not able to ensure financial viability of renewable energy projects, other than hydro. This is due to important constraints: First, tariffs are expressed in the local currency in order not to overburden the national budget in case of devaluation; Second, in the two first FiTs schemes incentives are guaranteed for a limited period of ten years; Third, the second FiT publication also includes caps to total and per plant solar PV and wind capacity without grid stability systems. The maximum capacity of individual solar PV plants would be 10MWp when connected to the distribution system and 20MWp when connected to the transmission system. **What is positive for investors is that if inflation grows faster than anticipated the schedule allows for an adjustment formula to ensure that they obtain a fair risk-adjusted return on their investment.** FiTs for all technologies are at least twice as high as the 23.74Gp/kWh composite Bulk Generation Charge (BCG) (Table 1).

Table 1: Feed in Tariff in Ghana (as of October 2014)

	Gp/kWh	US\$/kWh Sept 2014 rate	US\$/kWh 2015 av. rate
Wind with grid stability systems	55.7	0.17	0.15
Wind without grid stability systems	51.4	0.16	0.14
Solar PV with grid stability/storage	64.4	0.20	0.17
Solar PV without grid stability/storage	58.4	0.18	0.15
Hydro <= 10MW	53.64	0.17	0.14
Hydro <100MW>10MW	53.9	0.17	0.14
Biomass	56	0.18	0.15
Biomass (Enhanced technology)	59	0.19	0.16
Biomass (Plantation as feed stock)	63.3	0.20	0.17

Source: PURC (2014)

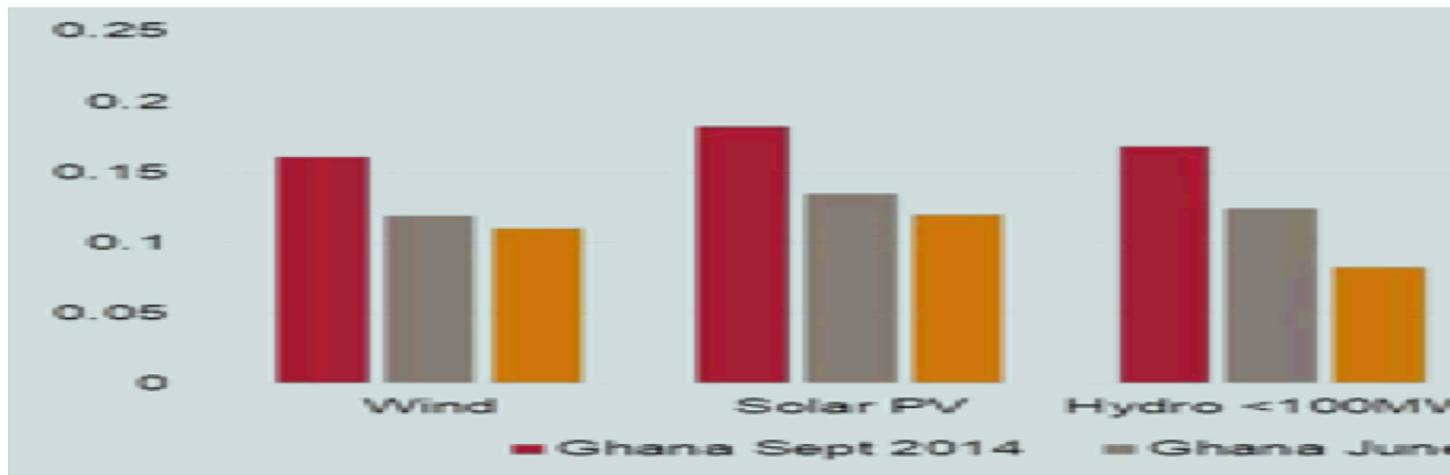
If we compare Ghanaian and Kenyan FiTs, we observe that FiTs are higher than those set in Kenya but are subject to a **higher foreign exchange risk**. Indeed, the FiT in Ghana is payable only in local currency at the above exchange rate. The Ghanaian scheme offers **cheaper and more predictable tariffs** for consumers than the Kenyan scheme. However, **the Kenyan system allows generators to recover their costs and insures them against fuel cost and exchange rate fluctuations**. Very high inflation rates and strong devaluation of the Ghanaian cedi against the US dollar introduce a significant risk for generators in Ghana.²⁹ Investors in RE in Ghana are

²⁹ Pueyo A, Bawakyillenuo S, Osiolo H (2016) Cost and Returns of Renewable Energy in Sub-Saharan Africa: A Comparison of Kenya and Ghana (Institute of Development Studies, Brighton, UK), IDS Tech Rep 190

not protected against further **currency devaluation** by the existing FiT scheme and there are concerns about the **creditworthiness of the off-taker**.

Figure 6 shows the FiT levels in Kenya and Ghana converted to USD. Because Ghanaian FiTs are set in the local currency, we show both the levels using the 2014 exchange rate - when the tariffs were approved, and the average 2015 exchange rate. On approval, the Ghanaian fees were significantly higher than those set in Kenya, but currency devaluation has brought them closer to Kenyan levels.

Figure 6: Feed-in Tariffs in USD/kWh in Ghana and Kenya (2014)



Source: Pueyo A, Bawakyillenuo S, Osiolo H (2016)

As observed, an additional obstacle for the Ghanaian FiT scheme is represented by the short time of the incentive period. In 2016, PURC has updated its FIT scheme with payment contracts which last for 20 years as opposed to the 10-year length (Table 2).³⁰

In brief, despite FiT scheme in Ghana has raised investor interest, such as in Kenya, this has not been the main driver for final project investment in renewable energy.

³⁰ <https://www.pv-tech.org/news/ghana-to-update-feed-in-tariffs-to-last-20-years>

Table 2: Third Ghanaian RE-Feed-in-Tariff

TYPE OF TECHNOLOGY	(1 - 10 years)	20 years
	Guaranteed FIT	Indicative FIT
	USCents per Kwh	USCents / Kwh
Wind	16.6	14.5
Solar PV	15.1	13.0
Hydro <= 10 MW	13.4	11.6
Hydro (>10 MW and <=100 MW)	14.3	12.3
Tidal Wave (Ocean Wave)	13.4	11.6
Run off River	13.4	11.6
Biomass	17.5	15.1
Biomass (Enhanced Technology)	18.5	15.9
Biomass (Plantation as Feed Stock)	19.8	17.0
Landfill Gas	17.5	15.1
Sewage Gas	17.5	15.1
Geoplutonic (Geothermal)	11.8	10.2

Source: Ghana Gazette, October 2016

3 Drivers for PPPs in energy infrastructure

Despite significant global attention on private investment in infrastructure, the bulk of infrastructure investment and planning comes from the public sector. In **Africa**, only **18% of all infrastructure spending comes from private investors**, with a large majority of this investment going into the telecommunications and **energy sectors**.³¹

On the other hand, Africa's **largest source of public finance** is represented by the Official Development Assistance (ODA), in the form of grants and concessional loans that remain important drivers of infrastructure and capital projects. ODA to Africa was worth USD 56bn in 2015 and is expected to increase to USD 58bn by the end of 2016.³²

The 2016 "Deloitte African Construction Trends" report shows that infrastructure investment in **West Africa represented more than a third (37% or USD 120b.) of total investment in the African continent**. In West Africa, Development Finance Institutions (DFIs) have become less prominent (7.6%), while African DFIs are funding 9.8% of projects and **private domestic firms are funding more projects than previously** (8.7% in 2016, compared to 4% in 2015), indicating that **Public Private Partnership (PPP) projects are gaining importance**.³³

Within this background, the private sector needs guarantees if it is to commit large investment to long-term projects that have considerable financial, political and regulatory risk. In LMICs contexts, such as in **Ghana** - the impact of these risks on private finance may be more important and long-

³¹ Soumya Chattopadhyay, Jeffrey Gutman & Amadou Sy (2015), Financing African Infrastructure: Can the World Deliver? Brookings Global Economy and Development Report

³² Deloitte, Africa Construction Trends Report | The Changing Realities Facing Africa: Implications for Infrastructure & Capital Projects, Nov2016

³³ Idem. p. 5

term financing is normally not available due to the unpreparedness of domestic banks holding only short-term deposits. In Sub-Saharan Africa (SSA) the longest available loan tenor is five years or even less, and where longer loan terms are available, commercial interest rates are higher (Irving and Manroth, 2009). Therefore, for a PPP to represent an economically viable solution in SSA, development finance may represent the prerequisite condition. In SSA risks in energy infrastructure investment are mostly associated with weak governance because infrastructure and services are mainly nationalized. In Ghana the electricity sector is almost completely unbundled.

Ghana is characterized in 2016 by a **73% debt-to-GDP ratio**³⁴ (with a 2017 target of 71%) thus has limited budgetary allocation to capital expenditures (-7.2% projected in 2017 from previous year³⁵) thus the need to partner with the private sector for infrastructure investment.³⁶ With the aim to improve investor confidence, the IMF Extended Credit Facility (ECF) programme has been extended to December 2018. A total amount of USD 918m will be given to Ghana as balance of payments support over the 3-year period.³⁷

Given challenges for access to capital can be greater and risk can be higher, PPPs looks like the best financing mechanism. Risk sharing is the fundamental characteristic of a PPP agreement because it facilitates the commitment of the public actors and at the same time the attractiveness of investment for the private actors (Alloisio, Carraro, 2015).³⁸

3.1. De-risking is key to lower the cost of capital

Risk mitigation is pivotal in order to lower the cost of capital in energy infrastructure investment. In the energy sector, regulatory and technology risks add to financing and liquidity risks (the variation of the cost of capital and lack of funding). On top of that there is a country risk, especially in developing countries, where financing and currency risks are also higher because of immature financial institutions and markets and higher volatility.

Assumed that the higher the perceived risk, the higher the internal rate of return (IRR) will be, three elements determine financing costs: the debt to equity ratio, the cost of equity and the cost of debt. The cost of debt depends on the interest rate, maturity and grace period of the loans provided. Equity investors usually require rates of return of at least twice the cost of debt, as they assume a higher risk. Projects with high equity shares therefore bear higher financing costs. Smaller and riskier projects typically require higher equity shares as they struggle to be attractive for debt investors.

In any case, data collected for **Ghana** shows a **debt-equity ratio of 70:30**, which is similar to that observed in developed countries with lower perceived risks. Project developers in Ghana can access both commercial and concessional finance. Commercial finance is faster to obtain but it charges highest rates and typically offers lower maturities. Concessional finance offers better terms but usually involves larger transaction costs and a slow turnaround.

³⁴ Ghana Statistical Service

³⁵ MoFEP

³⁶ Capital Markets in Africa, *Into Africa*, April 2017, at

http://www.capitalmarketsinafrica.com/INTOAFRICA/INTOAFRICA_APRIL_2017.pdf

³⁷ <http://www.mofep.gov.gh/sites/default/files/news/BRIEF%20ON%20IMF%20PROGRAMME.pdf>

³⁸ Alloisio I., Carraro C., "Public Private Partnerships for energy infrastructure: a focus on the MENA region", in "Public Private Partnerships for Infrastructure and Business Development". Ed. Caselli et al., Palgrave Macmillan, London, September 2015

Given the high cost of local finance and the inefficient local capital markets, access to international finance is key for the viability of energy infrastructure projects. However, **DFIs remain relatively risk averse in the Ghanaian market**. This may be explained by the **currency risk**, since DFIs are restricted by currency financing and are more inclined to projects that have foreign exchange cash flow.

Average debt rates for international finance, with some concessional finance, are 7.5%. Fully commercial debt would require 12 to 16% interest rates. Domestic lending rates are significantly higher, at 21 to 37%. Loan maturities are in the range from 9 to 15 years. IRR required by equity investors can be as high as 30%.³⁹

As already observed, one of the most important challenges for infrastructure investment in Ghana is the **lack of a credible off-taker**. The private sector needs **guarantees** to face the policy and the financing risks entailed by the time gap between a project's planning phase and its actual implementation. **In Ghana risk mitigation instruments appear mainly to address political risk rather than policy risk**. The Ministry of Power is more inclined not being involved with guarantees for renewable energy projects, but rather use those guarantees mechanisms put in place by the World Bank.

The WB **Multilateral Investment Guarantee Agency (MIGA)** offers political risk insurance instruments to investors, and also partially covers the impact of policy change. Another guarantee instrument implemented by the World Bank is the **partial risk guarantee**. It covers policy risks such as changes in law and retroactive measures, and payment default by the national power company under the Power Purchase Agreement (PPA).⁴⁰ E.g., MIGA has been requested to provide guarantees up to approximately USD 36m for both equity investments and loans to Amandi Energy Limited, a power company incorporated in Ghana to construct and operate a new 190 MW dual-fuel combined cycle gas turbine power plant.⁴¹

The WB approved in 2015 a record investment of USD 700million guarantees for Ghana's **Sankofa Gas Project**. This is a unique combination of two guarantees for the Project – an International Development Association (IDA)⁴² payment guarantee of USD 500million for timely payments for gas purchases by Ghana National Petroleum Corporation and an International Bank for Reconstruction and Development (IBRD) Enclave Loan guarantee of USD 200million that enables the project to secure financing from its private sponsors. Together, the guarantees are expected to mobilize USD 7.9bn in new private investment for offshore natural gas, representing one of the biggest FDI in Ghana's history.⁴³

However, even with this constraint for investors the Ghanaian Government continues to provide **Government Consent and Support Agreements (GCSP)** that play the same role of a quasi-

³⁹ Ghana Capital Partners (GCP) (2015), '28MW Solar PV Plant – Ghana', Presentation for WAFCEF Forum, Abidjan, African Development Bank 17 September 2015

⁴⁰ Alloisio, Carraro, 2015

⁴¹ <https://www.miga.org/Pages/Projects/ESRS.aspx?esrsid=148&pid=1430>

⁴² IDA guarantee covers only debt and not equity investments.

⁴³ <http://www.worldbank.org/en/news/press-release/2015/07/30/world-bank-approves-largest-ever-guarantees-for-ghanas-energy-transformation>

guarantee.⁴⁴ This kind of guarantee has been applied to the **West African Gas Pipeline project** by the Government of Ghana.⁴⁵

3.2 The role of Multilateral Development Banks (MDBs)

Other than the role of guarantee to private investors, MDBs can play a transformational role in infrastructure investment for two main reasons: one is financial and the other one concerns human capital. On finance, the **MDBs enjoy a significant natural leveraging effect of public capital**. For instance, the WB can mobilize USD 28 from international markets for each dollar put in as paid capital. A recent analysis by S&P has shown that the MDBs could lend an additional USD 1 trillion without losing their credit rating.⁴⁶ Furthermore, **the MDBs have the skills needed to structure complicated public-private investments in infrastructure**. This skillset is instead in short supply in national governments, commercial and investment banks and private equity firms.

Traditional MDBs such as the World Bank, and the regional MDBs such as the African Development Bank (AfDB) and the European Investment Bank (EIB) thus remain important funders of Africa's infrastructure. Under the **New Deal on Energy for Africa** strategy, the AfDB's goal is to help achieve universal access to electricity by 2025 by developing a platform for public-private partnerships for innovative financing in Africa's energy sector. The Bank alone has committed to spend USD 12bn to enhance electricity access in Africa (2016-2020) and to leverage between USD 45-50bn in co-financing (from the private sector) for energy projects in Africa during that period.⁴⁷

The World Bank's portfolio in Ghana consists of 31 IDA-financed projects with a net commitment of approximately USD 2,000bn (as of 2012).⁴⁸

3.3 The role of Development Finance Institutions (DFIs)

Other than MDBs, also international Development Finance Institutions (DFIs) and Sovereign Wealth Funds (SWFs) play a crucial role in development finance in Africa. International DFIs and Chinese lenders each funded a relatively equal proportion (13.1% and 13.4% respectively) of projects in Africa.⁴⁹

Africa remains heavily reliant on the Chinese economy. China is now the largest financier of power projects in Africa (Eberhard and Shkaratan 2012)⁵⁰. A quarter of investments in energy in Africa come from China, and those investment are mainly focused on large hydro projects. However, Chinese investment has also led to the **first privately owned solar PV** independent

⁴⁴ CEPA, 2017.

⁴⁵ Tomoko Matsukawa; Odo Habeck (2007). Review of risk mitigation instruments for infrastructure financing and recent trends and developments, World Bank, Public-Private Infrastructure Advisory Facility (PPIAF)

⁴⁶ http://s3.amazonaws.com/aws-bsdc/BSDC_SustainableFinanceSystem.pdf

⁴⁷ https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Brochure_New_Deal_2-En.pdf

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<http://web.worldbank.org/external/default/main?pagePK=34370&piPK=34424&theSitePK=4607&menuPK=34463&contentMDK=23154439>

⁴⁹ Deloitte, Africa's changing infrastructure landscape Africa Construction Trends Report , 2016

⁵⁰ Eberhard, A. and Shkaratan, M. (2012) 'Powering Africa: Facing the Financing and Reform Challenges', Energy Policy 42/2012

power producers (**IPP**) in **Ghana, a 20MW plant financed by BXC Beijing China**, at an estimated cost of more than USD 30million.

Today, DFIs such as China Development Bank and China Export-Import Bank have a larger global asset base than all of the MDBs combined. Moreover, the performance of African private equity funds, as measured by internal rates of return (IRR), shows some link to the rise and fall of the Chinese economy, as measured by GDP growth. In 2007, when China's annual GDP growth exceeded 50%, the 5 years rolling IRR of African funds was more than 30%. By 2015, as China's GDP growth fell to 7%, the 5 year-IRR slumped to around 1%.⁵¹

Although China led greenfield investment in Africa in 2015-16, investment by other economies is on the rise. The leading investors after China in terms of value of announced greenfield investment were the United Arab Emirates (USD 14.9bn), followed by Italy (USD 11.6bn) and the US (USD 10.4bn). Eni SpA became the third largest investor following its decision to build the Zohr gas processing plant in Egypt (Figure 7).

Figure 7: Top investing companies in Africa by capital investment, 2015-16 (cumulative)

Investing company	Capital investment (USD billion)	Number of projects	Jobs created
China Fortune Land Development (CFLD)	20.0	1	3 000
Al Habtoor Group	8.5	1	3 000
Eni SpA (Eni)	8.1	5	2 984
China Petroleum Pipeline Bureau (CPP)	6.0	2	6 000
Office Cherifien des Phosphates (OCP)	4.2	4	947
Sisban Holding	3.6	1	3 000
Terra Sola	3.5	1	776
China State Construction Engineering Corporation	3.3	1	3 000
Indorama	3.1	3	3 002
Bionas Agropolitan Technology Corridor	2.5	1	1 520
Total E&P Angola	2.2	1	214
Taaleritehdas	2.2	7	5 150
Enel Green Power	2.2	11	516
Korea Electric Power	2.1	1	210

Source: Elaboration from fDi Markets (2017).

Other countries such as Germany with **DEG**, the DFI with focus on the private sector in developing countries, is keen on increasing its investments in IPPs with RE sources in the West African sub-region and Ghana as a key prospective market. Out of the EUR 1billion portfolio DEG has in Africa, a third is in West Africa, amounting to about EUR 300million. With a standing portfolio of about USD 270million in Ghana, DEG has made investments of about USD 40 million in 2012, and were expected to repeat that feat in 2013 (Ghana Daily Graphic, November 2012).

⁵¹ Into Africa, March 2017, at http://www.capitalmarketsinafrica.com/INTOAFRICA/INTOAFRICA_MARCH_2017.pdf

Other OECD countries, such as Japan with the **Japan International Cooperation Agency** has partnered with the Government of Ghana and invested USD16.4million for the construction of two primary substations for the Northern Electricity Distribution Company (NEDCO).⁵²

The **Ghana Power Compact** is the largest U.S. Government transaction to date and will serve as an anchor for increased US engagement in Ghana. The US Millennium Challenge Corporation will invest up to USD 498.2million to transform Ghana's power sector and stimulate private investment. The Government of Ghana has pledged to invest at least USD 37.4million of its own money. The Compact is expected to catalyze at least USD 4.6billion in private energy investment and activity from US firms in the coming years.⁵³

3.4 The renewed Africa-EU Strategic Partnership

The priorities proposed within the Africa-EU Strategic Partnership are to focus on unleashing economic opportunities, achieving strong institutions and good governance and ensuring access to affordable and reliable energy sources. The renewed partnership with African countries will be realized on the basis laid down in the **Joint Africa-EU Strategy**⁵⁴, the Agenda 2030 and the Paris Agreement.

3.4.1 EU-Africa Infrastructure Trust Fund

SSA was identified by the EU among the regions the most in need for development cooperation and financial contribution. Established in 2007 the **EU-Africa Infrastructure Trust Fund (EU-AITF)** aims to increase investment in infrastructure in SSA by **blending long-term loans with grant resources** to gain financial and qualitative leverage as well as project sustainability. One of the two financing envelopes of the EU-AITF, the SE4ALL envelope, is addressed to finance access to energy in Africa.

The EU-AITF allocated funds to increase access of national power systems in West Africa and Ghana. One of the most significant investments in the region is the EUR 27.25million contribution for the construction of a transmission line allowing power exports initially from Cote d'Ivoire to Liberia, Sierra Leone, and Guinea. The EU-AITF supported the project through technical assistance and provided interest rate subsidies and investment grants. In Ghana, the EU-AITF in 2009 granted EUR 1.75million to the West African Power Pool (WAPP) to finance pre-investment studies for a 330 kV transmission link from Côte d'Ivoire to Ghana. The project enhanced regional integration and strengthened the Coastal Backbone, which also connects Benin, Togo and Nigeria.

Against this background, in September 2016 a **new European External Investment Plan (EIP)** (EC, 2016a)⁵⁵ to encourage investment in Africa and in the EU-Neighbourhood, to strengthen partnerships and contribute to achieve the SDGs was announced. The EIP has been conceived with the objective to **facilitate EU private enterprises exporting their businesses outside the**

⁵² <https://www.esi-africa.com/news/japanese-agency-pledges-full-support-to-ghana/>

⁵³ <https://www.mcc.gov/where-we-work/program/ghana-power-compact>

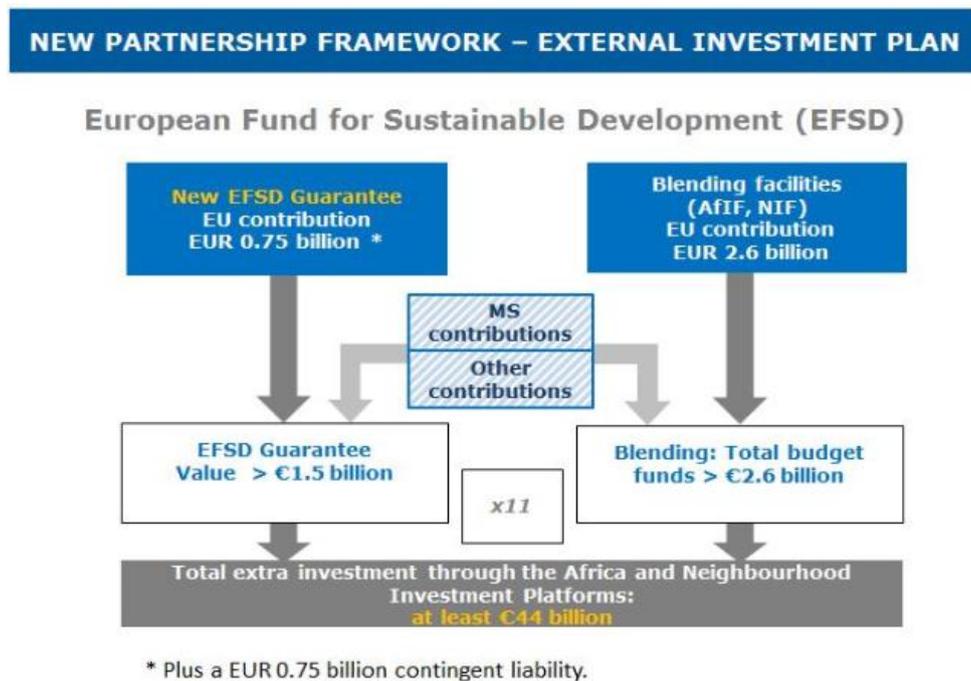
⁵⁴ EU Council (2007). The Africa-EU Strategic Partnership: a Joint Africa-EU Strategy (2007).

⁵⁵ European Commission (2016d). COM (2016) 581 final, 14/09/2016. Strengthening European Investments for jobs and growth: Towards a second phase of the European Fund for Strategic Investments and a new European External Investment Plan.

EU in countries favoring a more stable economic and political environment. At the centre of the EIP lies the creation of a **new European Fund for Sustainable Development (EFSD)** (EC, 2016b)⁵⁶.

The EFSD is expected to trigger additional public and private investment volumes, mobilising total investments of up to EUR 44billion (based on EUR 3.35billion contribution from the EU budget and the European Development Fund) and up to 88billion euro should Member States also contribute to the blending financing mechanism (Figure 8). In short, the EIP will support the implementation of the new Partnership Framework and the achievement of Agenda 2030 in Africa.

Figure 8: The European Fund for Sustainable Development (source: EU, 2016b)



4. Best practice example of PPP in Ghana

4.1 Kpone Independent Power Plant project

The ambitious Kpone Independent Power Plant project is a landmark USD 900million energy project which aims to transform electricity generation across West Africa. The project will be a Combined Cycle Gas Turbine ('CCGT') plant with a planned capacity of 350MW contributing approximately 10% of Ghana's total installed capacity and approximately 20% of its available thermal general capacity, supplying power to over one million homes. The development of the project has been commissioned in late 2014 to Cenpower Generation Company Ltd, a special-

⁵⁶ European Commission (2016e). COM(2016) 586 final of 14.09.2016. Commission proposal for a Regulation of the European Parliament and of the Council on the European Fund for Sustainable Development (EFSD) and establishing the EFSD Guarantee and the EFSD Guarantee Fund

purpose vehicle aiming to become Ghana's leading private sector power company that was created with the purpose of developing the plant.

The project finance comprises two components: a USD 650million debt tranche and a USD 250million equity tranche. The debt is being funded under export credit cover by a consortium of South African commercial banks and international DFIs. Rand Merchant Bank (RMB) acted as the global lead bank and mandated lead arranger for the commercial banking tranche. Other South African banks involved in the transaction were Nedbank and Standard Bank. The Export Credit Insurance Corporation ('ECIC') of South Africa, provided the export credit cover for the South African commercial tranche. On the other hand, FMO, the Dutch Development Bank, acted as the mandated arranger for the DFI tranche (Table 3).

Via the equity raising, three leading investment groups joined the equity consortium: Sumitomo Corporation of Japan (first ever thermal IPP investment in Africa), African Infrastructure Investment Fund II and its co-investors (via an investment vehicle called Mercury Power) and FMO. Post financial close, the equity holders in Cenpower now are AFC Equity Investments Limited (a wholly owned subsidiary of the Africa Finance Corporation (AFC) (31.85%), Sumitomo Corporation (28%), Cenpower Holdings Limited (21%), Mercury Power (15%) and FMO (4.15%).

The plant represents the biggest licensed IPP in Ghana in terms of financing, as well as the first project finance deal in Ghana **to take fuel supply risk**. In fact, the USD 93million **Fuel Finance Facility** – provided by the DFIs involved in the project – was specifically designed to address the significant constraints facing the Ghana Power Sector, including fuel supply challenges due to natural gas shortage, liquid fuel price variability and issues with availability of liquid fuel (Light Crude Oil and Distillate) storage and treatment infrastructure.

Furthermore, this is the first IPP in Ghana to be developed on a Build Operate Transfer (BOT) basis: the plant will be returned to the Ghanaian Government after 20 years of operation. It has enough potential to act as a pioneering energy project not only for Ghana but for the whole West African region. In fact, it represents a truly African solution to the continent huge power shortage problem, as the founding shareholders are Ghanaian, the construction company is African, the biggest share of equity is held by African companies and the majority of senior debt is issued by African lenders. In brief, it can be considered a leverage for further African investment in African infrastructure (Table 4).

Table 3: Case-study of PPP Combined Cycle Gas Turbine Power Plant in Ghana

Country	Ghana	Capacity	340 MW
Technology	Combined Cycle Gas Turbine (CCGT)	Development Stage	Financial closure
Type of PPI	Greenfield project	Subtype of PPI	Build, operate and transfer
Contract period	N/A	Commissioning year	2014
Main revenue source	PPA	Contract award method	License scheme
PPP Project	Yes	PPP part of public project	Yes
Sponsors	Africa Finance Corporation; Sumitomo Corporation; Cenpower Holdings Limited; Mercury Power; FMO (Dutch Development Bank)	Equity share	Africa Finance Corporation (AFC) (31.85%) \$79.6 m, Sumitomo Corporation (28%) \$70 m, Cenpower Holdings Limited (21%) \$52,5 m, Mercury Power (15%) \$37.5 m, FMO (4.15%) \$10.4 m
Concessional loans (Bilateral/Multilateral)	Development Bank of Southern Africa (DBSA) \$74.33 m EAIF (Emerging Africa Infrastructure Fund) \$74.33 m FMO(Dutch Development Bank) \$74.33 m IDC (Industrial Development Corporation) \$74.33 m DEG (Deutsche Investitions-und Entwicklungsgesellschaft mbH) \$74.33 m OFID (OPEC Fund for Infrastructure Development) \$74.33 m	Grants (FMO)	\$10.4 m
Concessional loans (Commercial) (under a guarantee by 'ECIC')	HSBC \$40 m Nedbank \$54.66 m RMB (South Africa) \$54.67 m Standard Bank \$54.66 m	Public: Private leverage achieved	N/A
Public and private debt funding	\$640 m	Private equity funding	\$250 m
Total financing mobilized	\$900 m	Debt/Equity grant ratio	70/30

Source: Author based on PPIAF data

Table 4: Kpone SWOT Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> - Largest private financed IPP in sub-Saharan Africa in the last 10 years - 67% of equity is held by African companies - 83% of senior debt is issued by African lenders - Payment guarantees by the government - Fuel supply risk covered by Fuel Finance Facility 	<ul style="list-style-type: none"> - Exchange currency rate for foreign investors - Depreciation of the cedi by 4.6% against the dollar (Nov 2016) - Lack of a legal framework for Public-Private Partnerships
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> - Deficit in power generation as an opportunity for potential investors - Return on investment due to the positive nexus electricity consumption – economic growth - Parliamentary approval of PPP Bill can enable additional private participation on infrastructure projects 	<ul style="list-style-type: none"> - Political instability can affect government’s commitment on payments - Uncertainty on Ghana’s GDP growth projections

5. Policy Conclusions

Half of Africa’s economies are dependent on a single resource export for more than three quarters of their export revenues. African governments need to structurally change and diversify away from being resource-driven and towards more services-orientated economies in order to thrive despite commodity price slumps.⁵⁷

DFIs should serve as brokers and market makers for private investors to mitigate risk perception, illiquidity and currency mismatches for large-scale private investors who want exposure to sustainable development sectors but do not invest due to high perceived risks. Investors in renewable energy in Ghana are not protected against further currency devaluation by the existing FiT scheme and there are concerns about the creditworthiness of the off-taker. Policymakers should target these key constraints to affordability and profitability to support a higher penetration of renewables in the country.

It is important that African countries begin their energy transformation through greenfield projects, since generating electricity from new renewable installations will be cheaper than generation at

⁵⁷ <http://blog.deloitte.com.ng/wp-content/uploads/2016/12/Deloitte-Africa-Construction-Trends-2016-Nov2016.pdf>

existing conventional power plants by 2030.⁵⁸ Many African countries are land-locked and some are characterised by small energy sectors spanning large geographic areas with poor infrastructure. In this framework, regional cooperation helps to overcome many barriers.

Most people without modern energy access are located in developing countries where oil and gas companies have a long history of operating. Companies can improve energy access by working with governments and local communities to determine how to best align their investments in a project with the community's needs.⁵⁹

Regulation, which is in place for network systems, and seldom for minigrids and off-grid solutions, can avoid monopoly power, high prices and low quality (hit-and-run) investment, although lack of regulation may facilitate a more rapid increase of energy access. It is thus recommended that the principles of a light-handed regulation approach be adopted, similar to the practice in Tanzania.

In conclusion, improvements in energy sector governance, energy diversification, regional co-operation, and light-handed regulation are key to bring in new energy investors in Africa.

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⁵⁸ Bloomberg New Energy Finance New Energy Outlook 2017

⁵⁹ http://ccsi.columbia.edu/files/2017/01/170620-Energy-and-Climate-Draft-Full-Master_v2.pdf

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