

**PROJECT INFORMATION DOCUMENT (PID)  
CONCEPT STAGE**

Report No.: AB2010

<b>Project Name</b>	<b>Ghana: Energy Development and Access Project</b>
<b>Region</b>	AFRICA
<b>Sector</b>	Power (100%)
<b>Project ID</b>	P074191
<b>Global Supplemental ID</b>	P070970
<b>GEF Focal Area</b>	C-Climate change
<b>Borrower(s)</b>	GOVERNMENT OF GHANA
<b>Implementing Agency</b>	Ministry of Energy, Volta River Authority, Electricity Company of Ghana
<b>Environment Category</b>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
<b>Date PID Prepared</b>	June 20, 2005
<b>Estimated Date of Appraisal Authorization</b>	January 31, 2006
<b>Estimated Date of Board Approval</b>	July 18, 2006

**1. Key development issues and rationale for Bank involvement**

1(a) **Enhancing Access to and Quality of Energy Services:** Hydropower is Ghana's major energy resource. The country's energy environment is changing dramatically. Integration through the West African Gas Pipeline (WAGP) and transmission links under the West African Power Pool (WAPP) is enabling access to other regional energy resources, the strengthening of system stability and reliability and helping the country hedge drought risks. Electricity access exceeds 50%, though its use by households and small- and medium-sized enterprises remains limited. Traditional energy resources like fuel-wood and charcoal, play an important and substantial role. Establishing a sustainable basis for their supply is a critical issue.

1(b) **Reforms in the Energy Sector:** In the last decade, Ghana has made significant progress on energy sector reform and provision of energy access. The accomplishments in reforms include tackling a long-standing issue with petroleum product pricing, the formation and operation of Public Utilities Regulatory Commission, the implementation of tariff rebalancing under the Electricity Sector Transitional Plan 1999-2003, the restructuring of sector entities and retirement of debt. In the area of rural electrification, Ghana is ahead of several other African countries in that access rates on average exceed 50 percent and a relatively dynamic community participation framework is already in place. More than 2,000 communities have been electrified under the National Electrification Scheme (NES). These accomplishments provide a solid foundation for tackling the remaining challenges of efficiency enhancement, financial discipline, institutional strengthening and more widespread energy/electricity access.

1(c) **The Challenge Ahead:** Looking forward, the challenges in the power sector are to improve supply characteristics, efficiency and the reach of energy services. These accomplishments will enable the country to: (i) serve existing customers better, (ii) ensure financial viability; and (iii) generate the opportunity and means to bring more power to more people. Similar challenges exist in growing use of modern fuels like LPG and ensuring energy security for the economically and socially vulnerable communities. A large investment program, to be financed by Government and donor development partners, is contemplated over the next 5 years to upgrade transmission and distribution infrastructure, and to expand access to modern energy services. Policymakers have to therefore create the right conditions to execute these investments efficiently and ensure economic operation of assets to achieve sustained financial viability in all segments of the energy sector, and to realize socio-economic development goals.

1(d) **Sector Issues:** The major challenges before Ghanaian policymakers are in the areas of: (i) efficiency; (ii) commercialization; (iii) rapid scale-up of energy access; and (iv) institutional restructuring and capacity enhancement.

(i) *Increasing efficiency of asset use.* The efficient use of assets will become more compelling as the country starts to deal with take-or-pay capacity costs for private power and gas purchases from West Africa Gas Pipeline beginning 2007. Robust and transparent initiatives need to be taken, accompanied by measurable performance indicators and clear accountabilities to deliver higher efficiencies in all segments of the sector. Generation assets like Takoradi 1 and the Effasu Barge need to be fully utilized. The proper use of these assets and continued power imports will help Ghana to defer investments in costly new capacity. Higher benefits will result from reduction in transmission and distribution losses.

(ii) *Commercialization.* As part of the ongoing reforms, the Government is trying to establish a more transparent and efficient power market. All bulk power entities in Ghana – including VRA and ECG – would execute commercial contracts to ensure transparency in the overall costs and to clearly identify rights and obligations of each entity. This measure would compel investment decisions to be diligent and enable the regulator to pass-through “real” costs to consumers. The commercialization of distribution functions is likely to be boosted by the proposed Management Support and Services Provider (MSSP) for ECG. The contract would establish clear accountability for performance and introduce clear criteria for measuring improvements in efficiency and quality of service, with appropriate baseline values of the indicators. A big part of commercialization is monetization of public sector cross-debt and energy receivables and payables. Besides improving the generally poor payment culture of government and public sector institutions, it would generate the cash required to settle regular capacity and energy payments for WAGP, Takoradi and the Tema Oil Refinery.

(iii) *Expanding energy access.* Since the late nineties Ghana has spearheaded numerous innovative programs to extend reliable energy access to rural areas. Under these programs more than 2000 communities have gained access. Programs such as the Self-Help Program (SHEP) have contributed to these outcomes. In 2005, the task of rural electrification has become more complex as the outreach is now to communities that are more remote and therefore more costly to connect, and concerns relating to alternatives and efficiency are

becoming more evident. For the next big leap in access therefore, alternative models to reinforce the current program and focus on off-grid and renewable technologies may become necessary. Furthermore, integrated financial mechanisms to level the playing field between various technologies and access alternatives, such as a common rural electricity fund to subsidize future access, would offer more rational ways to finance the expansion.

(iv) *Institutional restructuring and capacity building.* Efficiency gains can be enhanced via institutional restructuring in all sub-sectors. In transmission, this would take the form of new technical and operating rules and the possibility of private management options for the operations and maintenance functions of the proposed new transmission utility. In rural access, the floating of technology-neutral financing and subsidy mechanisms and institutional arrangements for executing scale-up investments are at issue. The future development of the sector, with potentially mixed ownership, possibly private operation and the advent of gas-to-power transactions, would require significant economic, technical and corporate oversight capacity in policy making and regulatory bodies. A good example would be creation of core capacity through a partnership of PURC, EC and the ETU<sup>1</sup> to perform indicative expansion planning for the national interconnected system. Capacity would be needed to plan and execute a program for retaining and reinvesting the benefits of low-cost hydropower towards future national priorities, including improving reliability and security of supply and increasing electricity access for un-served areas etc. Therefore, technical assistance to strengthen and build institutional capacity would have a high economic payoff.

1(e) **Government strategy to address key issues:** The Government's efforts to reshape the sector have broadly focused on reforms and targeted investments, consistent with promoting the economy, ensuring efficiency and expanding access.

- **Generation:** The Government is taking steps to engage the private sector to rapidly complete the combined cycle expansion of the Takoradi-2 plant and operationalize the Effasu Barge. The Energy Commission and the PURC are collaborating to explore ways to promote grid-connected embedded generation plants through standardized rules and frameworks for private small power development.
- **Transmission:** The Government issued policy directives requiring VRA to functionally unbundle and transfer national transmission and load dispatch assets to an Electricity Transmission Utility (ETU). While VRA's transmission capacity will be significantly strengthened under the ongoing WAPP initiative, additional measures need to be taken to improve the efficiency of the transmission system. This applies *inter alia* for areas where the ECG and VRA systems are linked, and where investments have been sub-optimal since the separation of these two companies.
- **Distribution:** In 1998, ECG, which is in charge of all distribution activities in Ghana, was converted into a limited liability company, ECG Ltd. under the Statutory Corporations (Conversions to Companies) Act 461 of 1993. It is proposed to de-merge the National Electricity Department, the distribution business unit of VRA. Options under consideration include merging it with ECG to create one distribution company or make it

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<sup>1</sup> Public Utility Regulation Commission, Energy Commission and Electricity Transmission Utility respectively.

a part of a new rural electrification utility. While these measures will help improve supply in rural areas, a more comprehensive private management arrangement is being contracted (the Management Support Services Agreement-MSSA) to operate ECG and address its inefficiencies and improve its operational and commercial results.

- **Energy Access:** Under an Economic Recovery Program (ERP) launched in 1983, the Government of Ghana undertook to adapt strategies that would redress problems of a declining macroeconomic environment. As part of this program, the Ministry of Energy instituted a National Electrification Scheme (NES) in 1989 as the principal instrument to achieve its policy of extending the reach of electricity to all parts of the country over a 30 year period. As a result of the program, access increased from roughly 30% in 1989 to 45% of the population in 2001. The Government wants to increase access to over 60% by 2012, even while the cost effectiveness and implementation efficiency of the program are coming into focus in the absence of a Rural Energy Agency.

1(f) **CAS and PRSP links:** The project is linked to the World Bank Country Assistance Strategy (CAS) 2004-2007, which was endorsed by the Bank's Board in March 2004. Building on the five pillars of the Ghana Poverty Reduction Strategy (GPRS), the new CAS sets out three major objectives: (i) accelerating growth and employment generation; (ii) achieving the human development Millennium Development Goals (MDGs); and (iii) enhancing governance for empowerment.

1(g) **Activities of other partners:** The European Investment Bank (EIB) and the Kuwait Fund for Arab Economic Development (KFAED) are currently co-financing the construction of a transmission line between Aboadze and Volta together with the World Bank as the first WAPP project. In the rural energy sector a number of smaller activities are ongoing. Under the Self-Help program for rural electrification continued cooperation has been extended by the Indian Export-Import Bank. UNDP is sponsoring an LPG program and the implementation of Multifunctional Platforms (MFPs) to promote productive uses for energy. The Japanese JICA and JBIC have recently been active both in the conventional and the rural energy sector. A Global Village Partnership (GVPEP) initiative is ongoing, which is to identify priority areas for development, including for energy. UNDP and the World Bank are co-sponsoring this initiative. For the preparation of this project exploratory meetings have been held with UNDP, and will be held with other partners such as EIB, USAID, AfDB and DFID. Early indications are that there is an interest by donors to participate in this project.

1(h) **Rationale for Bank involvement:** A long history of partnership in the energy sector places the Bank in a unique position to continue to assist Ghana in tackling its energy challenges. Besides strategically complementing investment financing, the Bank is assisting the sector through knowledge transfer and technical assistance. The suggested Project is guided by findings from completed and ongoing AAA work on Energy Policy issues in both urban and rural sectors. The Bank's involvement with ECOWAS countries to expand regional energy trade provides an additional dimension to its partnership with Ghana. Bank involvement will: (i) enable substantial financing support; (ii) introduce cutting-edge knowledge products, especially in the area of distribution and customer services; (iii) strategically complement regional activities in the energy sector, including the WAGP and the WAPP; and (iv) leverage

contemporary public-private financing instruments hitherto not commonly used in Africa such as “carbon credit” financing of loss reduction and efficiency improvements.

## **2. Proposed objective(s)**

2(a) The development objectives for Ghana are to: (i) improve the transmission and distribution networks to enhance reliability and efficiency of power to existing customers; (ii) provide increased access to affordable, reliable and adequate electricity; and (iii) improve the efficiency and security of fuels such as LPG, wood, and charcoal.

Proposed global objective

2(b) The Project will contribute to mitigating climate change through the reduction of greenhouse gas emissions in line with the United Nations Framework Convention on Climate Change and its Kyoto Protocol, to which Ghana is a Party (GEF OP 5 and 6). Moreover, the efficiency enhancing measures in the transmission and distribution sector are likely to generate additional greenhouse gas emission reductions for which carbon finance may be claimed.

Proposed monitoring indicators

2(c) Project specific M & E indicators will be employed. Quantitative indicators will include: power availability from generation, voltage level reliability indices for transmission, technical/commercial efficiency indicators for distribution, new consumers added for access, and standard financial indicators to measure sectoral viability. Qualitative measures will include periodic perception surveys, visual inspections, site visits and feedback from civil society in formal and informal settings.

## **3. Preliminary project description**

3(a) The proposed Project aims to target three key areas in Ghana's energy sector: transmission, distribution, and rural access. The aim of interventions in the transmission sector is to increase the capacity and reliability of the system. Investments in the distribution sector will reduce system losses, increase overall efficiency of and strengthen the distribution network, and thereby improve ECG's financial position. The rural access component will provide increased access to electricity and improved efficiency and security of fuels.

3(b) **Component 1: Transmission.** This component will be implemented by VRA. The main thrust of this component is to reduce transmission losses and to enhance the reliability of supply. Requirements in transmission could include, for example, the construction of the second Kumasi Bulk Supply Point (BSP), the third Accra BSP, a 120 km 69 kV Network Extension between Kpando and Kedjebi, and a Substation Upgrade Project. The transmissions network is currently also benefiting from a number of investments to be undertaken under a new regional World Bank project in the context of the WAPP, which are mainly in the area of transmission.

3(c) **Component 2: Distribution.** This component will be implemented by ECG, and will build on the ongoing work under the Distribution System Upgrading Project (DSUP), which is

part of the Thermal Power Project (P000926).<sup>2</sup> Key investments focus on the improvement of energy service quality and resulting financial flows by rehabilitating the existing networks, enhancing the quality of service delivery, implementing loss reduction measures and enhancing commercial capabilities. Major investments in network rehabilitation could include upgrades of critical supply points and sub-stations, switching and control equipment, rehabilitation and/or replacement of distribution transformers, upgrades to existing overhead lines, replacement of capacitors, computerization of commercial operations, secondary network automation, rural SCADA, prepayment metering, voltage regulators on long feeders, an energy conservation and safety program, and additional service centers. The investment program in distribution will be implemented under the MSSA regime being established for ECG.

3(d) **Component 3: Access Expansion.** The component would complement the Government's efforts to achieve its electrification goals. This component will build on the existing access expansion programs (NES), which have reached the mid-point of their implementation. The support would help Ghana to take stock of results, and promote more effective processes and institutional arrangements to enhance impacts. Access intensification strategies will be developed for grid-connected areas. For new areas, alternatives such as renewables, where these are least cost, and off-grid technologies, will be promoted in addition to the grid-expansion models. This component would also support promotion of efficiency and security of fuels such as LPG, wood, and charcoal. The Energy Sector Management Assistance Program (ESMAP) will support a component on “Productive Use for Energy”, to complement the Access Expansion Component.

3(e) **Component 4: Capacity Building.** Capacity building efforts will complement the efforts of the Government to establish and operate robust, sustainable energy sector institutions and carry out informed policy making.

3(f) **Financing needs:** The total project cost is estimated to be about US\$160 million. The level of investment required in the transmission and distribution components alone add up to approximately US\$142 million. Of this VRA's business requires about US\$63 million, ECG requires about US\$41 million, and NED requires about US\$38 million. IDA funding of approximately US\$80 million is potentially available. It is expected that the GEF would contribute about US\$7 million to the project in support of its policies on removal of barriers for renewable energy sources and energy efficiency. This leaves a funding gap of approximately US\$73 million. The Government will be seeking additional bilateral assistance to address the funding gap. If at appraisal the financing of the entire program is not secured, the team will follow a strategy of scaling down program components.

#### **4. Safeguard policies that might apply**

As the Project interventions will largely focus on the replacement of equipment or on small-scale extensions as part of sub-projects, the project category is expected to be B. Under the Bank's program to pilot the use of borrower safeguard systems, the Bank is considering the potential use of Ghanaian systems to address environmental and social safeguard issues in this project in the

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<sup>2</sup> This project is scheduled for completion in December 2006, and focuses on stabilizing the network around the Greater Accra Area, while the proposed project focuses on enhancing reliability outside of Accra.

following areas: (a) Environmental Assessment; (b) Cultural Property; (c) Natural Habitats; and (d) Resettlement. Before a final determination is made of the areas for piloting, diagnostic work will be undertaken to assess: (a) the equivalence of Ghanaian systems and World Bank requirements; and (b) the acceptability of implementation practices, track record and capacity of the agencies involved. For the areas selected for piloting, OP/BP 4.00, *Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects* will apply. In the event that the Bank decides not to use borrower systems in any of these areas, the respective operational policies will apply as follows: (a) OP/BP 4.01, *Environmental Assessment*; (b) OPN 11.03, *Cultural Property*; (c) OP/BP 4.04, *Natural Habitats*, and/or (d) OP/BP 4.12, *Involuntary Resettlement*.

**5. Tentative financing**

Source:	(\$m.)
BORROWER/RECIPIENT	10
INTERNATIONAL DEVELOPMENT ASSOCIATION	80
GLOBAL ENVIRONMENT FACILITY	7
FINANCING GAP	63.2
Total	160.2

**6. Contact point**

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