PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

<table>
<thead>
<tr>
<th>Project Name</th>
<th>WAPP APL4 (Phase 1) - Côte d'Ivoire, Sierra Leone, Liberia, and Guinea Power System Re-development</th>
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<tbody>
<tr>
<td>Region</td>
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<tr>
<td>Sector</td>
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<tr>
<td>Borrower(s)</td>
<td>COTE D’IVOIRE, LIBERIA AND GUINEA</td>
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<td></td>
<td>Republic of Côte d’Ivoire</td>
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<td></td>
<td>Republic of Guinea</td>
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<td>Republic of Liberia</td>
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<td>Cotonou, Benin</td>
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<tr>
<td>Environment Category</td>
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<td>Date PID Prepared</td>
<td>January 28, 2009</td>
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<tr>
<td>Estimated Date of Appraisal Authorization</td>
<td>January 19, 2010</td>
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<tr>
<td>Estimated Date of Board Approval</td>
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1. Key development issues and rationale for Bank involvement

1.1 Regional Overview: The 15 member states1 of the Economic Community of West African States (ECOWAS) occupy some five million square kilometers and are currently home to about 250 million people. Half of the present population lives in poverty, with per capita income barely above US$300 per year. Despite the region’s large energy endowment, the per capita consumption of electricity is among the lowest in the world with approximately 160 kWh per capita. Faced with this power system expansion challenge, ECOWAS Member States have acknowledged that past efforts to achieve national self-sufficiency in electricity supply have been uneconomical due to the high cost of establishing power generation and transmission infrastructure. They also acknowledge two major shortcomings in the region at the present time: (a) over-reliance on hydro-based power systems will not provide sufficient regional security of electricity supply, and (b) the lack of adequate transmission infrastructure (within and between national power systems) is the weakest link in the drive towards greater cooperation in power sector development. To address these challenges ECOWAS has formed and put in place the West Africa Power Pool (WAPP) – *a cooperative power pooling mechanism for integrating national power system operations into a unified regional electricity market* – with the expectation that it will, over the medium to long term, assure citizens of a stable and reliable electricity supply at affordable costs.

1.2 WAPP Cooperation Framework: ECOWAS Member States are facing up to the challenge ahead by taking collective action to mobilize financing on a larger scale than has hitherto been forthcoming to establish, *inter alia*, a robust infrastructure platform for the WAPP. They have recognized that a pre-condition for successful regional energy integration in West Africa is the establishment of a transparent and harmonized policy, regulatory and commercial framework for cross-border electricity

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1 Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.
trade throughout the community. Accordingly, the community’s highest decision-making body – the Summit of the Heads of State and Government of the ECOWAS Member States – is pursuing a deliberate, step-by-step approach to forge consensus, put in place the core (legal, regulatory, technical, investment programming) building blocks for the WAPP initiative, so as to provide prospective donors and financiers with clear evidence of the collective ownership by ECOWAS member states.

1.3 In July 2006, the “WAPP Organization” was formally inaugurated as an all-inclusive organization of (public and private) electric power utilities based in ECOWAS member states. The governance structures of the WAPP organization comprise, a) The General Assembly, which comprises representatives of all members and is the highest decision making body; b) The Executive Board, which consists of six elected members and the Secretary General and is responsible for policy, overseeing WAPP operations and planning for future development; c) The WAPP Organizational Committees, which include the Engineering and Operations, the Strategic Planning and the Finance & Human Resources Committees and is composed of technical experts of WAPP Membership to provide support and advice to the Executive Board; and, d) The WAPP Secretariat, which is the administrative organ headed by the Secretary General and is responsible for the day-to-day operations of the WAPP.

1.4 The Revised Master Plan of the WAPP retained the interconnections between Man - Monrovia and Conakry - Bumbuna on the priority list of projects. WAPP is now implementing these as the CLSG Power Network (in reference to the Member States involved; ie Cote d’Ivoire, Liberia, Sierra-Leone and Guinea); incorporating the bulk power infrastructure between Man in Cote d’Ivoire and Linsan in Guinea as one sub-program. Realisation of the CLSG Power Network will also interlink the WAPP Coastal Transmission Backbone and the OMVG/OMVS Power system Development. The proposed CLSG Power Network project remains one of the high priority projects in the revised ECOWAS Master Plan.

1.5 World Bank support of the WAPP: On June 30, 2005, the Bank’s Executive Board of Directors endorsed the application of the adjustable program lending (APL) instrument, within the framework of the World Bank’s Regional Integration Assistance Strategy (RIAS) for West Africa, as the vehicle for providing IDA credit support to the WAPP initiative. The Bank has earmarked substantial IDA resources (USD 350 million equivalent, under the IDA Regional Pilot Program) to put in place a multi-year programmatic framework to help close the financing gap and thereby ensure timely implementation of priority WAPP investments and technical assistance activities of the Revised ECOWAS Master Plan.

1.6 The APL instrument would enable IDA credit support to be provided in a flexible manner – when borrowers have satisfied the policy triggers (country commitments under the ECOWAS Energy Protocol, EEP) and when individual WAPP priority investments are ready to receive IDA credit support. The originally designed APL structure excluded the two most fragile states in the region, Liberia and Sierra Leone. The proposed APL4 structure closes this gap by including the proposed regional investments required for these areas in the framework of the World Bank APL program. The figure below illustrates the APL phases envisaged under the WAPP program.

1.7 The APL Program is consistent with the WAPP sub-programs indicated earlier and would combine investments to develop the necessary generation and transmission infrastructure with the introduction of common “rules of practice” covering the institutional, regulatory, technical/operational

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2 On June 30, 2005, the Board approved the first constituent lending operation under the WAPP APL facility – an IDA credit to Ghana (USD 40 million equivalent) for development of the first phase of the Coastal Transmission Backbone Project (WAPP APL 1 – Phase 1 of Coastal Transmission Backbone). Subsequently, on June 29, 2006, the Board approved two sets of IDA credits: (i) USD 45 million equivalent to Ghana and (ii) USD 15 million equivalent to Benin for the second phase of the Coastal Transmission Backbone Project (WAPP APL 1 – Phase 2 of Coastal Transmission Backbone); and (iii) USD 25 million equivalent each to Mali, Mauritania and Senegal (OMVS countries) to develop the 60 MW OMVS Felou Hydroelectric Project (WAPP APL 2 - OMVS Felou HEP).
and commercial pre-requisites for promoting cross-border electricity trade – WAPP Cooperation Agreements. Although tailored to specific power system configurations within the sub-program, each WAPP Cooperation Agreement will be formulated based on the core principles embodied in the EEP. Over time, the expectation is that two zonal power pooling mechanisms will converge into a unified, well functioning regional power pooling mechanism.

1.8 **CLSG Power Network:** The proposed CLSG Power Network comprises a transmission interconnection between Côte d’Ivoire, Liberia, Sierra-Leone and Guinea totaling about 1,100km in length together with the scheduled exploitation of viable indigenous generation resources in accordance with a least-cost regional generation plan.

1.9 The candidate generation schemes to be evaluated and prioritized for incorporation in the CLSG project are the following:
   A. 200 MW Thermal Plant in Yekepa or Buchanan in Liberia based on imported coal.
   B. Reconstruction of Mount Coffee HEP in Liberia
   C. St Paul River HEP in Liberia
   D. Mano River HEP in Liberia & Sierra-Leone
   E. Benkongor HEP in Sierra-Leone
   F. Yiben and Bumbuna Completion in Sierra-Leone.
   G. Kassa B HEP in Guinea
   H. HEP development in Lower Konkoure basin (ie Kaleta, Souapiti and/or Amaria)

1.10 The line route for the proposed transmission network which is about 1,100 km long will be in the proximity of four hydro sites considered to be of regional significance (Mano River, Benkongor, Yiben and Kassa A/B). Accordingly, the line will be located appropriately to enhance the development prospects of these sites, maximize future utilization and to avoid the need for relocation.

1.11 The proposed transmission network can be considered to be in two logical parts. The part of the CLSG Network which starts from Man (Côte d’Ivoire) to Monrovia (Liberia) targets the provision of electricity and at reasonable cost to the economic center of Nzérékoré in Guinea, the nearby mining concessions in the Nimba Mountains of Liberia as well as the urban centers of Buchanan and Monrovia in Liberia. The interconnection with the Côte d’Ivoire network will allow the countries to quickly obtain cost effective and reliable supply to reduce the amounts of unmet demand in the near term. The aim of the interconnection for the medium to long term is to secure and improve the reliability of supply by giving access for the development of the three local generation schemes identified earlier as A, B and C. The other part of the CLSG Network which connects Monrovia (Liberia) through Sierra-Leone to Linsan (Guinea) seeks to increase access and reliability of electricity service in the zone by: i) connecting together the power networks of the three states of Liberia, Sierra-Leone and Guinea; ii) providing physical and market access for the development of the most competitive schemes among the other substantial generation resources of the area (ie Schemes D – H above); and at the same time, iii) completing the interconnection of the CLSG Power Network with the rest of the WAPP network.

1.12 **Partnership of WAPP Donors:** The WAPP initiative is a partnership of ECOWAS Member States that is supported by several donors and international financing institutions (IFIs), including the World Bank (WB), African Development Bank (AfDB), European Investment Bank (EIB), US Agency for International Development (USAID), Agence Française de Développement (AFD), European Commission (EC), West African Development Bank (BOAD), ECOWAS Bank for Investment and Development (EBID), Africa Finance Corporation (AFC), and Islamic Development Bank (IsDB). The ECOWAS Secretariat is responsible for coordination of the partnership through the “Meeting of WAPP Donors” which convenes regularly to reviews and update financing commitments for WAPP priority investment projects.
2. Proposed objective(s)

2.1 WAPP APL: The goal of West Africa Power Pool (WAPP) is to establish a well-functioning, cooperative, power pooling mechanism for West Africa, as a means to increase access of the citizens of the Economic Community of West African States (ECOWAS) to stable and reliable electricity at affordable costs.

2.2 The overall developmental objective of the CLSG Power Network - WAPP APL4 (Phase 1) project is to increase access to electricity supply to Liberia and Guinea through power provided in the medium to long term from the exploitation of viable indigenous generation resources in accordance with a least-cost plan, but obtained in the near-term from Côte d’Ivoire and commercial mining operations in the area. WAPP APL4 (Phase 2) will include Sierra Leone.

2.3 The CLSG Power Network project which is accorded high-priority by WAPP will provide and augment power supply for economic recovery by extending the regional transmission network from the substation at Man in northern Côte d’Ivoire through the rich mining areas of Nimba Mountains and important economic centers of Nzérékoré in Guinea, Buchanan and Monrovia in Liberia and through the Bumbuna HEP in Sierra-Leone to Kindia/Linsan in Guinea for the benefit of the population centers there as well.

2.4 For the near-term, the much needed electricity supply to the main economic centers which are presently under-served either because of inadequate or non-existent generation capacity will be obtained from pre-existing sources.

2.5 For the medium to long term, the project will facilitate i) the extension of electricity access, ii) the development of the indigenous energy resources of the area to increase supply and iii) unconstrained cross border electricity exchanges which will enable the optimal utilization of these resources through power pooling to reduce the cost of electricity supply in the region as a whole.

3. Preliminary description

3.1 The CLSG Power Network - WAPP APL4 (Phase 1) project, will finance the following complement of investments and technical assistance:

Component 1: 225 kV Interconnection between Cote d’Ivoire and Liberia (US$ 190 million). This component involves the construction of a 225 kV transmission network from Man in Cote d’Ivoire to Monrovia in Liberia. It includes the following elements:

- Construction of 450 km of 225 kV transmission line;
- Construction of five (5) new 225/90/33 kV substations in Man (Côte d’Ivoire), Yekepa (Liberia), Buchanan (Liberia); Monrovia (Liberia); and, Nzerekore in Guinea.

Originally the routing of the line was to go through Sanniquellie (Liberia) but the node in this area has been changed to Yekepa since this is where the main load in the area (ie the iron ore mining operation) is based.

Component 2: Supply Alternatives and Energy Security (US$ 5 million). This component is to provide technical assistance to i) undertake a comparison of the supply options to determine the least cost addition plan for meeting the needs of the participating countries by prioritizing the generation projects and ii) prepare for early implementation the priority generation projects identified.
The technical assistance under this component will evaluate the status of preparedness of each of the supply alternatives and by taking into account their location, generation capacity, cost and production profile, and recommend the optimum sequence of generation additions that best meets the projected demand and ensures energy security. The deliverables of the technical assistance in respect of the preparation of the priority generation projects would include where necessary feasibility studies and Environmental and Social Impact Assessments (ESIAs), as well as procurement plans and documents.

**Component 3: Development of the Institutional Implementation Framework** (US$ 5 million). This component will provide technical assistance for i) the structuring and initial set-up of the Special Purpose Vehicle (SPV); ii) the establishment of the regulatory arrangements iii) the negotiation of the cooperation agreements between participating states and utilities; and iv) the preparation or updating of national electrification plans for each of the participating countries as well as priority national projects required to maximize the benefits of interconnection. This component will also provide v) the necessary complementary investment for system control and communication (SCADA), for the efficient operation of the interconnection as part of the larger West African Power Pool (WAPP). The use of an Optical Transmission System (OTS) based on optical ground wire on the 225 kV line will be considered as primary communication channel.

3.2 Liberia will cover about 82% of the overall project cost, Côte d'Ivoire will cover about 10.5%, and Guinea will cover about 7.5% of the overall project costs. The feasibility studies for the CSLG Power Network, Environmental Impact Assessment and Resettlement Actions Plans, and the bidding documentation are being financed by the European Investment Bank (EIB) and are underway.

4. **Safeguard policies that might apply**

The proposed 225 kV transmission line will run mainly through unpopulated areas, and impacts to the local population are unlikely to be significant. However, due to the regional nature and length of the proposed transmission line a category A rating is proposed. The following safeguard policies apply: Environmental Assessment (OP/BP 4.01), Involuntary Resettlement (OP/BP 4.12), Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), and Physical Cultural Resources (OP/BP 4.11).

5. **Tentative financing**

 Source: ($m.)

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<td>International Development Association (IDA)</td>
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<td>Foreign Multilateral Institutions (unidentified)</td>
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<td><strong>Total</strong></td>
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6. **Contact point**

Contact: Fanny Kathinka Missfeldt-Ringius  
Title: Senior Energy Economist  
Tel: (202) 458-9645  
Fax: (202) 614 1337  
Email: fmissfeldt@worldbank.org