

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC13995

Project Name	OMVS - HYDROPOWER AND ENERGY INFRASTRUCTURE DEVELOPMENT PROJECT (P147921)
Region	AFRICA
Country	Africa
Sector(s)	Hydropower (100%)
Theme(s)	Regional integration (100%)
Lending Instrument	Investment Project Financing
Project ID	P147921
Borrower(s)	The Republic of Mali, Islamic Republic of Mauritania, The Republic of Senegal
Implementing Agency	Mali - SOGEM - Societe de Gestion de Manantali
Environmental Category	B-Partial Assessment
Date PID Prepared/ Updated	29-Sep-2014
Date PID Approved/ Disclosed	18-Feb-2015
Estimated Date of Appraisal Completion	31-Jul-2015
Estimated Date of Board Approval	29-Oct-2015
Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

The 15 member states of the Economic Community of West African States (ECOWAS) occupy some five million square kilometers and are currently home to about 300 million people. Half of the present population lives in poverty, with per capita income barely above US\$300 per year, and 170 million still lack access to electricity.

Mali, Senegal and Mauritania are member states of ECOWAS with a combined population of 30.5 million (13.5 million each in Mali and Senegal and 3.5 million in Mauritania). Mauritania's and Senegal's GDP per capita is US\$ 1,190 and US\$ 1,120 respectively, while Mali is at a significantly lower level of US\$ 683 per capita . While Mali is a landlocked country with 65% of its land covered by desert, Senegal and Mauritania both have access to the Atlantic Ocean. The Senegal River rises in Guinea and Mali and downstream forms the border between Senegal and Mali, before

spilling into the Atlantic Ocean.

Mali, Mauritania and Senegal all face daunting energy challenges. Poor infrastructure and low access to energy have constrained GDP growth in all three countries. With a growing population, energy demand is expected to grow requiring additional generation capacity for the region. Mali, Mauritania and Senegal currently rely on hydropower, supplemented with expensive oil-based power generation, to meet their baseload electricity needs. As a result of this generation mix coupled with high technical and commercial losses, utilities in all three states have been incurring financial deficits and increasingly relying on government support to cover operating costs and finance required investments. The power grids of the three countries are interconnected and countries trade power through a central dispatching center.

Sectoral and Institutional Context

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. ECOWAS includes 15 countries of which 9 small size economies and 4 land-locked countries. There are three main sources of energy in West Africa including Hydropower (concentrated in Guinea), Gas along the coast from Nigeria to Cote d'Ivoire, and solar in the Sahel region. Providing affordable, reliable, and sustainable energy services to all in West-Africa will require power trade between countries with large generation capacity and other countries.

Acknowledging the fact 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, ECOWAS Member States have established 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.

The WAPP Infrastructure Program consists of a number of distinct but mutually reinforcing infrastructure sub-programs, which will over time create a unified regional power grid. The four sub-programs include: (i) Coastal Transmission Backbone (Cote d'Ivoire, Ghana, Benin/Togo, Nigeria); (ii) Inter-zonal Transmission Hub Sub-program (Burkina Faso and Mali via Ghana, OMVS via Mali, Liberia-Sierra Leone-Guinea via Cote d'Ivoire); (iii) OMVG/OMVS Power System Development Sub-program (The Gambia, Guinea, Guinea Bissau, Mali, Mauritania and Senegal); and (iv) North-core Transmission Sub-program (Nigeria, Niger, Burkina Faso, Benin) that aims to upgrade and extend existing capacity to transfer low cost energy supply to Niger, Burkina Faso, North Benin/Togo.

The OMVS (Guinea, Mali, Mauritania, Senegal) and OMVG (The Gambia, Guinea, Guinea Bissau, and Senegal) share two common member states. Mali, Mauritania, and Senegal have been exchanging power through the interconnected OMVS grid for a number of years. Guinea will soon be interconnected to other coastal countries through the WAPP-CLSG interconnector. The OMVG interconnection is the “missing gap” in the western side of the broader WAPP network and will interlink to the OMVS grid to the north, and the CSLG transmission line to the east. The only current OMVS-OMVG link is through the transmission grid of Senegal; a more formal and shorter link is necessary to improve power flow and the stability of the two sub-regional interconnection systems.

OMVS is the most advanced sub-regional power pool in West Africa. It has become a key actor within the region, and is seen as a strong, stable regional organization with a critical role for regional integration in West Africa and an example to others, including the OMVG.

In the past decade, much investment has been made in interconnecting various countries through a grid of transmission lines. The World Bank Group has supported implementation of the WAPP master plan through several projects including IDA financing and technical assistance. This has resulted in a series of sub-regional grids but increasingly power trade is limited due to generation deficits. Going forward, WBG support will have increased focus on generation using private sector investment, creating the mechanisms to facilitate regional power trade, in addition to a continued focus on closing the missing transmission links.

OMVS Organization

OMVS was established in 1972 by the Governments of Mali, Senegal and Mauritania, with a mandate to ensure multi-purpose water resources development, including electricity supply. The hydropower potential of the Senegal River Basin is estimated at 1,200 MW, of which only 260 MW has so far been developed. During the 1990s, a special purpose company - Societe de Gestion de l'Energie de Manantali (SOGEM) (jointly owned by all three OMVS countries) was established. The OMVS Power System comprises the Manantali (200 MW) and Felou (60MW) hydroelectric plants and a 1,000 kilometer system of 225kV transmission lines and sub-stations that evacuate electricity produced at the Manantali and Felou hydroelectric plant to the main load centers of Mali, Mauritania, and Senegal. The grid is operated in real-time by a central load dispatching system located at Manantali. In March 2006, Guinea joined as the fourth OMVS riparian country and the four Heads of State approved the implementation of the joint Senegal River Basin Development Program. The OMVS has since embarked on a comprehensive program of legal and institutional reforms, supported by the World Bank through the Senegal River Basin Multipurpose Water Resources Development operation.

Manantali and Felou provide the lowest cost energy in the sub-region (about 7 US\$ cents/kWh compared to average cost of energy generation from 25 – 33 US\$ cents kWh). Power generated by Manantali and Felou is allocated on a formula basis. Mali receives 52% of the electricity generated, Senegal 33%, and Mauritania 15%. By 2018, the OMVS countries expect to benefit from the Gouina Hydropower Plant (95 MW) and the Banda Gas to Power Project (300 MW) which will enable production of natural gas for generation of electricity to reduce the cost and increase supply in Mauritania and allow regional integration through exports of electric power from Mauritania to Senegal and Mali. Studies for other hydropower sites in the Senegal basin are underway and a second phase of gas development in Mauritania could also increase the generation capacity in OMVS countries.

Relationship to CAS

The Project supports the World Bank Group's corporate goals to end extreme poverty and promote shared prosperity by providing the three countries access to additional affordable, reliable, and sustainable electricity and promoting regional integration. By supporting the option for a regional response economic opportunity and integration, the Bank also supports the potential of regional integration in markets, infrastructure and natural resource management for sustainable growth and development through improved physical connectivity, increased trade and economic competitiveness. The proposed project is part of the Sahel initiative (announced by the World Bank

President in November 2013) and is aligned with the first pillar of the Bank Africa strategy to promote competitiveness. The Project will help to the financial recovery of utilities in three countries and reduce reliance on government subsidies through lowering the cost of generation.

The project is also in line with the “Directions for the World Bank Group’s Energy Sector” which puts a strong emphasis on leveraging private sector resources and experience to enable reliable and more efficient energy sectors in developing countries, and with Africa’s energy strategy, in particular the first three pillars aiming at expanding electricity coverage, scaling up regional power generation and transmission capacity, and improving sector planning and utility performance.

Lastly, the Project is aligned with the strategic context in each country with energy as a central piece of the Country Partnership Strategies of Mauritania and Senegal, and Mali’s Interim Strategy Note; particularly with their objectives to develop an integrated transmission and distribution network and increasing access to power supply from competitive sources.

The Project complements ongoing and planned WBG operations in the sub-region, including the the Félou hydropower project (FY06), the Banda Gas to Power Guarantee operation (FY14), the Mali Energy Support Project (FY09), the Senegal Electricity Sector Support Project (FY12) and the private sector led Senegal Taiba Ndiaye thermal power generation project (FY13). All these projects aim to support power generation expansion and improved utility management in order to meet growing electricity demand in the sub-region. The Senegal River Basin Multi-Purpose Water Resources Development Project (FY14) aims to enhance regional integration among the riparian countries of the Senegal River Basin. The projet also supports studies to harness the hydropower potential in the basin. These include complementary studies for Koukoutamba dam (294 MW), Balassa dam (180 MW) as well as scoping study on micro-hydro development for rural electrification in Guinea.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The objective of the proposed project is to improve the reliability and capacity of the OMVS interconnected power system.

Key Results (From PCN)

19. The project will help increase the reliability of the utilities access to energy and facilitate energy trade within the OMVS system.
 - (a) Transmission lines rehabilitated under the project (Km)
 - (b) Distribution lines constructed under the project (Km)
 - (c) Average interruption frequency per year in the project area (number)
 - (d) Electricity losses per year in the project area – (percentage)
 - (e) Number of beneficiaries (number)

III. Preliminary Description

Concept Description

The proposed project will finance selected investments to reinforce and extend the OMVS regional power infrastructure. This includes investments improve the reliability of power generation at Manantali through the rehabilitation and upgrade of electrical installations. The project will also

strengthen the transmission infrastructure for power evacuation by financing the rehabilitation and renewal of lines and substations taking into account planned and future power generation and related load flows. Moreover, the proposed project will finance technical assistance to SOGEM to strengthen its technical, operational, and financial performance and support the preparation of tender documents for recruitment of a private operator. Lastly, the program will finance additional technical studies (including hydropower studies as needed).

The project's proposed components are the following:

Component 1: Manantali power system rehabilitation (\$35 million) will finance the (i) rehabilitation of equipment at Manantali including equipment to help implement and operate control systems, flood detection device and dispatching center; and (ii) the rehabilitation of high voltage transmission lines and substations, which includes the acquisition of back-up transformers and reactors to limit the high risk of failure and other ancillary works.

Component 2: OMVS power grid reinforcement (\$105 million) will finance the upgrade of the regional transmission infrastructure between national power systems. This component will finance the construction of new transmission lines and substations to further develop the system capacity and reliability by enhancing power flow between member countries in the context of new gas and hydro power generation and also interconnect the OMVS and the OMVG sub-regional power systems.

Component 3: Technical Assistance (\$US10 million) will finance technical assistance to SOGEM and to its newly created subsidiary with a particular focus on operation and maintenance to help strengthen its technical, operational, and financial functions and help prepare the tender documents for the recruitment of a private operator. The component will also finance the owner's engineer's contract for the supervision of the works. Because the urgency of rehabilitation often results in financing decisions taking place prior to adequate investigations and designs, the proposed project will also finance additional studies aimed at advancing the technical analysis to better integrate the ongoing rehabilitation on the mechanical and electrical installations such as analyses to better integrate the ongoing rehabilitation on the mechanical and electrical installations. Lastly, this component will finance hydropower studies (including technical, environmental and social, institutional, financial and transaction support) for future generation.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04		x	
Forests OP/BP 4.36		x	
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11	x		
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12	x		
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	

Projects in Disputed Areas OP/BP 7.60		x	
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V. Financing (in USD Million)

Total Project Cost:	150.00	Total Bank Financing:	150.00
Financing Gap:	0.00		
Financing Source			Amount
BORROWER/RECIPIENT			0.00
International Development Association (IDA)			150.00
Total			150.00

VI. Contact point

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