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Report No: 89594-AFR

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A PROPOSED CREDIT IN THE AMOUNT OF SDR 33.4 MILLION (US\$47 MILLION  
EQUIVALENT) TO THE REPUBLIC OF THE GAMBIA

A PROPOSED CREDIT IN THE AMOUNT OF SDR 21.4 MILLION (US\$30 MILLION  
EQUIVALENT) TO THE REPUBLIC OF GUINEA

A PROPOSED CREDIT IN THE AMOUNT OF SDR 55.5 MILLION (US\$78 MILLION  
EQUIVALENT) TO THE REPUBLIC OF GUINEA-BISSAU

A PROPOSED CREDIT IN THE AMOUNT OF SDR 32 MILLION (US\$45 MILLION  
EQUIVALENT) TO THE REPUBLIC OF SENEGAL

FOR THE

OMVG INTERCONNECTION PROJECT

April 6, 2015

Energy and Extractives Global Practice  
Africa Region

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective February 28, 2015)

Currency Unit = US\$  
EUR 0.88 = US\$1  
US\$1 = SDR 0.7105351

FISCAL YEAR  
January 1 – December 31

## ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
AFD	<i>Agence Française de développement</i> (French Development Agency)
AMA	Asset Management Agency ( <i>Agence de gestion des Ouvrages communs de l'OMVG</i> )
ATMO	<i>Assistance Technique à la Maîtrise d'Ouvrage déléguée</i>
CESMP	Contractor Environmental and Social Management Plan
CLSG	Cote d'Ivoire - Liberia - Sierra Leone - Guinea interconnector
CQS	Consultants' Qualifications
CRSE	<i>Commission de Régulation du Secteur de l'Electricité</i> (Electricity Sector Regulatory Commission)
DSE	Environmental and Social Management Department
ECOWAS	Economic Community Of West African States
EDG	<i>Electricité de Guinée</i> (Electricity of Guinea)
EEP	ECOWAS Energy Protocol
EHS	Environmental, Health and Safety
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
ESIA	Environmental and Social Impact Analysis
ESMP	Environmental and Social Management Plan
FIRR	Financial Internal Rate of Return
FM	Financial Management
Genco	Generation Company
GDP	Gross Domestic Product
CGFO	Ground wires containing optic fibers
GHG	Greenhouse Gas
GRS	Grievance Redress Service
GW	Giga Watt
GWh	Giga Watt hour
HFO	Heavy Fuel Oil
HV	High Voltage
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
IDA	International Development Agency

IFR	Interim Financial Report
IPP	Independent Power Producer
ISDB	Islamic Development Bank
KF	The Kuwait Fund
KfW	Kreditanstalt für Wiederaufbau (Reconstruction Credit Institute, Germany)
kV	Kilo Volt
KVA	Kilovolt Ampere
kWh	Kilo Watt Hour
LMCC	Local Monitoring and Coordination Committee
M&E	Monitoring and Evaluation
MW	Mega Watt
NGO	Non-Government Organization
NCB	National Competitive Bidding
NMC	National Monitoring Committee
NPV	Net Present Value
OMVG	<i>Organisation pour la Mise en Valeur du fleuve Gambie</i> (The Gambia River Basin Development Organization)
OMVS	<i>Organisation pour la Mise en Valeur du fleuve Sénégal</i> (Senegal River Basin Development Organization)
O&M	Operations and Maintenance
PAP	Project Affected Persons
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PRG	Partial Risk Guarantee
QCBS	Quality and Cost-Based Selection
RAP	Resettlement Action Plan
REIs	Requests for Expressions of Interest
RFP	Request for Proposals
RPF	Resettlement Policy Framework
SBD	Standard Bidding Documents
SEC	Special Establishment Convention (Convention portant création de l'Agence des Ouvrages communs de l'OMVG)
SSA	Sub-Saharan Africa
TA	Technical Assistance
TSA	Transmission Service Agreement
RoW	Right of Way
WADB	West African Development Bank
WAPP	West African Power Pool

Vice President:	Makhtar Diop
Country Director:	Colin Bruce
Senior Global Practice Director:	Anita Marangoly George
Practice Manager:	Meike van Ginneken
Task Team Leaders:	Pedro E. Sanchez and Chris Trimble



**AFRICA**  
**OMVG INTERCONNECTION PROJECT**

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**PAD DATA SHEET**  
*Africa*  
*OMVG Interconnection Project*  
**PROJECT APPRAISAL DOCUMENT**

*AFRICA*

Report No.: 89594-AFR

Basic Information			
Project ID P146830	EA Category B - Partial Assessment	Team Leader Pedro E. Sanchez & Chris Trimble	
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ]		
	Financial Intermediaries [ ]		
	Series of Projects [ ]		
Project Implementation Start Date 30-Apr-2015	Project Implementation End Date 30-Jun-2022		
Expected Effectiveness Date 30-Aug-2015	Expected Closing Date 31-Dec-2022		
Joint International Finance Corporation (IFC) No			
Practice Manager/Manager  Meike van Ginneken	Senior Global Practice Director  Anita Marangoly George	Country Director  Colin Bruce	Regional Vice President  Makhtar Diop
The Republic of The Gambia, The Republic of Guinea, The Republic of Guinea-Bissau, The Republic of Senegal			
Responsible Agency: OMVG			
Contact: Justino Vieira		Title: Executive Secretary	
Telephone No.: +221338895101		Email: <a href="mailto:jvanaksa@omvg.sn">jvanaksa@omvg.sn</a>	
Project Financing Data(in USD Million)			
[ ] Loan	[ ] IDA Grant	[ ] Guarantee	

<input checked="" type="checkbox"/> [ X ]	Credit	<input type="checkbox"/> [ ]	Grant	<input type="checkbox"/> [ ]	Other					
Total Project Cost:		696.00			Total Bank Financing:			200.00		
Financing Gap:		0.00								
<b>Financing Source</b>						<b>Amount</b>				
BORROWER/RECIPIENT						16.00				
International Development Association (IDA)						200.00				
African Development Bank						134.00				
European Investment Bank						106.00				
France Government. of [Ministry of Foreign Affairs (MOFA) and <i>Agence Française de Développement</i> (AFD) (C2D)]						51.80				
Islamic Development Bank						93.70				
Germany <i>Kreditanstalt Fur Wiederaufbau</i> (KFW)						32.00				
West African Development Bank						53.60				
Kuwait Fund for Arab Economic Development						23.90				
Total						711.00				
<b>Expected Disbursements (in USD Million)</b>										
Fiscal Year	2015	2016	2017	2018	2019	2020	2021	2022		
Annual	0.0	55.9	84.3	42.0	8.8	4.0	3.0	2.0		
Cumulative	0.0	55.9	140.2	182.2	191.0	195.0	198.0	200.0		
<b>Proposed Development Objective(s)</b>										
The project development objective is to enable electricity trade between The Gambia, Guinea, Guinea-Bissau and Senegal.										
<b>Components</b>										
<b>Component Name</b>						<b>Cost (USD Millions)</b>				
Component 1: Extension of WAPP transmission network – OMVG Interconnection						163.00				
Component 2: Technical Assistance to OMVG						37.00				
<b>Institutional Data</b>										
<b>Practice Area / Cross Cutting Solution Area</b>										



Energy & Extractives				
<b>Cross Cutting Areas</b>				
<input type="checkbox"/> Climate Change <input type="checkbox"/> Fragile, Conflict & Violence <input type="checkbox"/> Gender <input type="checkbox"/> Jobs <input type="checkbox"/> Public Private Partnership				
<b>Sectors / Climate Change</b>				
Sector (Maximum 5 and total % must equal 100)				
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Energy and mining	Transmission and Distribution of Electricity	100	100	
Total		100		
I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.				
<b>Themes</b>				
Theme (Maximum 5 and total % must equal 100)				
Major theme	Theme	%		
Trade and integration	Regional integration	70		
Financial and private sector development	Infrastructure services for private sector development	15		
Environment and natural resources management	Climate change	15		
Total		100		
<b>Systematic Operations Risk- Rating Tool (SORT)</b>				
<b>Risk Category</b>			<b>Rating</b>	
1. Political and Governance			Substantial	
2. Macroeconomic			Substantial	
3. Sector Strategies and Policies			Substantial	
4. Technical Design of Project or Program			Moderate	
5. Institutional Capacity for Implementation and Sustainability			High	
6. Fiduciary			Substantial	
7. Environment and Social			Substantial	

8. Stakeholders		High	
9. Other		High	
<b>OVERALL</b>		<b>High</b>	
<b>Compliance</b>			
<b>Policy</b>			
Does the project depart from the CAS in content or in other significant respects?		Yes [ ] No [ X ]	
Does the project require any waivers of Bank policies?		Yes [ ] No [ X ]	
Have these been approved by Bank management?		Yes [ ] No [ ]	
Is approval for any policy waiver sought from the Board?		Yes [ ] No [ X ]	
Does the project meet the Regional criteria for readiness for implementation?		Yes [ X ] No [ ]	
<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>	
Environmental Assessment OP/BP 4.01	<b>X</b>		
Natural Habitats OP/BP 4.04	<b>X</b>		
Forests OP/BP 4.36	<b>X</b>		
Pest Management OP 4.09		<b>X</b>	
Physical Cultural Resources OP/BP 4.11	<b>X</b>		
Indigenous Peoples OP/BP 4.10		<b>X</b>	
Involuntary Resettlement OP/BP 4.12	<b>X</b>		
Safety of Dams OP/BP 4.37		<b>X</b>	
Projects on International Waterways OP/BP 7.50		<b>X</b>	
Projects in Disputed Areas OP/BP 7.60		<b>X</b>	
<b>Legal Covenants</b>			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Implementation committees		2 months after effectiveness	
<b>Description of Covenant</b>			
By no later than 2 months after the Effective Date, (i) the Participating Countries and OMVG shall establish the Monitoring and Advisory Committee, and (ii) the Recipient shall establish a National Monitoring Committee with composition, functions and resources satisfactory to the Association and, within applicable local government units, Local Monitoring and Advisory Committees with composition and responsibilities in form and substance satisfactory to the Association, as further described in the ESMP and the Project Implementation Manual.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>

Internal Auditor		3 months after effectiveness	
<b>Description of Covenant</b>			
An internal auditor for the OMVG Secretariat to be recruited no later than 3 months after the Effective Date, with qualifications and experience satisfactory to the Association.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Owner’s Engineer Contract		4 months after effectiveness	
<b>Description of Covenant</b>			
The owners engineer has been recruited no later than 4 months after the Effective Date.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Commercial Agreements		12 months after effectiveness	
<b>Description of Covenant</b>			
The Recipient shall take all measures required on its part to ensure that each of the Kaleta Power Purchase Agreements and the Transmission Service Agreements shall have become effective by the date which is 12 months after the Effective Date.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
AMA established		24 months after effectiveness	
The Recipient shall take all measures required on its part to ensure that the Asset Management Agency be established no later than 24 months after the Effective Date.			
<b>Conditions</b>			
<b>Source Of Fund</b>	<b>Name</b>	<b>Type</b>	
IDA	Special Establishment Convention	Effectiveness	
<b>Description of Condition</b>			
The Special Establishment Convention has been adopted by the Heads of State of each of the Participating Countries.			
<b>Source Of Fund</b>	<b>Name</b>	<b>Type</b>	
IDA	Subsidiary agreements	Effectiveness	
<b>Description of Condition</b>			
The Subsidiary Agreements have been executed on behalf of the Participating Countries and OMVG.			
<b>Source Of Fund</b>	<b>Name</b>	<b>Type</b>	
IDA	Operations Manual	Effectiveness	
<b>Description of Condition</b>			

The Participating Countries have adopted the Operations Manual related to the implementation of the Project in form and substance satisfactory to the Association.

Source Of Fund	Name	Type
IDA	Financing for Western Branch	Disbursement on component 1

#### Description of Condition

Financing for the Western Branch (Linsan - Kaolack) has become effective, and the right of the Participating Countries to make withdrawals under the relevant financing agreement (other than the effectiveness of the IDA Financing Agreement) shall have vested.

Source Of Fund	Name	Type
IDA	Project Management Firm (ATMO) Contract	Disbursement on component 1

#### Description of Condition

The contract for the Project Management Firm (Assistance Technique à la Maîtrise d'Ouvrage) has been signed in form and substance satisfactory to the Association.

Source Of Fund	Name	Type
IDA	AMA created	Annual disbursement on component 2.2

#### Description of Condition

(i) the Asset Management Agency has been legally established and made operational in the territory of one of the Participating Countries in accordance with the AMA Legislation, all in form and substance satisfactory to the Association, and AMA has assumed full control of the management and operation of the OMVG Transmission Network; (ii) the AMA Project Agreement have been signed in form and substance satisfactory to the Association; (iii) OMVG has entered, under terms and conditions acceptable to the Association, into an assignment and assumption Agreement with the Asset Management Agency pursuant to which OMVG shall, among other things, assign all of its rights under the Subsidiary Agreements to AMA and the Asset Management Agency shall assume all of OMVG's obligations (financial and otherwise) under the Subsidiary Agreements; and (iv) AMA has appointed OMVG to continue to perform until the Closing Date, all fiduciary, administrative, disbursements, safeguards, reporting and other Project implementation support responsibilities under the Project, under terms and conditions acceptable to the Association.

Source Of Fund	Name	Type
IDA	Contributions to O&M fees	Disbursement on component 2.2

The Asset Management Agency has made payments into the O&M Dedicated Account, on a pari passu basis with the Financing provided for Part 2.2 of the Project for the previous year.

#### Team Composition

##### Bank Staff

Name	Title	Specialization	Unit
Pedro E. Sanchez	Lead Energy Specialist	Co-Task Team Leader (ADM)	GEEDR

Christopher Philip Trimble	Energy Specialist	Co-Task Team Leader	GEEDR
Alpha Mamoudou Bah	Senior Procurement Specialist	Senior Procurement Specialist	GGODR
Salamata Bal	Senior Social Development Specialist	Senior Social Development Specialist	GURDR
Aissatou Diallo	Senior Finance Officer	Senior Finance Officer	WFALA
Maman-Sani Issa	Senior Environmental Specialist	Senior Environmental Specialist	GENDR
Manuel Jose Millan Sanchez	Power Engineer	Power Engineer	GEEDR
Marie-Paule Ngaleu	Program Assistant	Program Assistant	GEEDR
Bella Lelouma Diallo	Senior Financial Management Specialist	Financial Management Specialist	GGODR
Cheick Traore	Senior Procurement Specialist	Senior Procurement Specialist	GGODR
Chris Saunders	Energy Specialist	Energy Specialist	GEEDR
Yussuf Uwamahoro	Energy Specialist	Energy Specialist	GEEDR
Nathalie Munzberg	Senior Counsel	Senior Counsel	LEGEN
Amadou Mamadou Watt	Energy Specialist	Energy Specialist	GEEDR
Michel Rogy	Senior ICT Policy Specialist	ICT Policy Advisor	GTIDR
Moez Cherif	Senior Energy Economist	Economic Analysis	GEEDR
Seynabou Thiaw Seye	Program Assistant	Program Assistant	AFCF1
Carmen Maria Pereira	Liaison Officer	Liaison Officer	AFMGW
Racky Dia Camara	Program Assistant	Program Assistant	AFMGN
Yassin Saine Njie	Program Assistant	Program Assistant	AFMGM
<b>Non-Bank Staff</b>			
<b>Name</b>	<b>Title</b>	<b>City</b>	
Mamadou Mansour Mbaye	Consultant	Washington, DC	
Jeesun Han	Consultant	Washington, DC	
David Ganske	Consultant	Washington, DC	
Farah Mohammadzadeh	Consultant	Washington, DC	



## I. STRATEGIC CONTEXT

1. **Sub-Saharan Africa (SSA) faces a power crisis.** Only one in three Africans has access to power. The combined generation capacity of SSA – with a population of 800 million – is only 68 gigawatts (GW), no more than that of Spain, a country of 40 million people. Excluding South Africa, SSA's power consumption is about one percent of the Organization for Economic Cooperation and Development (OECD) levels. Power consumption in SSA is enough only to power one light bulb per person for three hours each day. Average power costs are approximately double those found in the rest of the developing world. This is mostly due to reliance on expensive liquid fuel thermal generation. Cheaper and cleaner energy sources such as hydropower, geothermal, and natural gas are unevenly located. A change of the energy mix away from thermal generation will require regional interconnections to connect energy resources to power consumers.
2. **Regional power trade is even more important in West Africa than elsewhere on the continent.** Eleven out of 15 countries are small size economies [Gross Domestic Product (GDP) <US\$5 billion] and do not have enough demand to develop at scale to achieve lower cost generation capacity. The cost of electricity generation is very high as a result of the region's high dependence on expensive (and dirty) oil-based thermal generation. This means that high tariffs of US\$0.20-30 per kWh are still not sufficient to cover the cost of supply.
3. **The proposed OMVG<sup>1</sup> interconnection will enable trade of electricity between The Gambia, Guinea, Guinea-Bissau, and Senegal and link them with the rest of West Africa.** Many inter-connector transmission lines have been built or are under construction and OMVG is the missing link to create the transmission backbone infrastructure of the West African Power Pool (WAPP). In parallel to creating this missing link, a focus on investments to developing generation capacity and moving beyond hardware to the software needed for increased power trading will be necessary to make the potential of power trade a reality.
4. **The proposed OMVG interconnection will help to optimize current and future generation investments.** By aggregating demand it will enable larger and more economical generation plants, including the development of the 6,000 megawatt (MW) hydropower potential of Guinea. It will improve the use of existing generation capacity through more economical dispatch and ensure continuity and quality of service in case of breakdown or maintenance.
5. **The proposed OMVG interconnection is a unique opportunity to extend energy services while also improving the financial viability of the national power utilities.** Power trade will also help deeper political and economic integration and promote increased regional stability. The OMVG interconnection is potentially transformational and economically viable under various scenarios for generation capacity coming on-line. Given the governance and capacity context, however, developing the interconnection future power trade in a sustainable and equitable manner will be challenging. Risk mitigation measures to address the challenges are laid out in the document.

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<sup>1</sup> The Gambia River Basin Development Organization (OMVG) / Organisation pour la Mise en Valeur du fleuve Gambie).

## **A. Regional and Country Context**

6. **Regional integration is critical to greater shared prosperity and ending poverty in the 15 member states of the Economic Community of West African States (ECOWAS).** The ECOWAS states occupy some five million square kilometers and are home to about 300 million people. They had an average economic growth of 6 percent per year during 2008-2012. Average per capita income is approximately US\$2,000 per year (current GDP per capita), and half the population lives in poverty as defined by those living on US\$2 per day. A substantial reduction of poverty will require sustained economic growth rates. This in turn will require massive investments to make up for current deficits in infrastructure. The high cost of infrastructure, particularly in some of the smaller countries, has been a barrier to development.

7. **The Gambia, Guinea, Guinea-Bissau, and Senegal are located in the Gambia River Basin and have a combined population of 29 million and GDP of US\$23 billion.** The OMVG was created in 1978 by a convention signed between Senegal and The Gambia to manage the river and its basin and to foster its economic development. Guinea and Guinea-Bissau became members in 1981 and 1983, respectively.

8. **Underscoring its vulnerability to external shocks and lack of diversification, real GDP growth in The Gambia is projected to contract by close to one percent in 2014.** This reflects sharp contractions in agricultural production, tied to poor rains, and in tourism receipts, tied to the outbreak of Ebola in neighboring countries that has discouraged travel to the wider sub-region. The 2014 downturn follows a modest recovery in 2012-2013, when GDP growth averaged 5.1 percent, in the aftermath of the 4.3 percent contraction in 2011 due to severe Sahelian drought. The Gambia is heavily dependent on rain-fed agricultural production, food imports, tourism receipts, and remittances inflows. Gambian transit and re-export trade activity has been hampered over the past decade by gains in competitiveness in neighboring countries and the impacts of the most recent political crises in Mali and Guinea-Bissau. The Gambian population stood at 1.8 million in 2013, and the GDP per capita was US\$494. Overall poverty rates declined from 58 percent in 2003 to 48.4 percent in 2010 (below \$1.25 per day), and education coverage and quality improved.

9. **A fragile economy, Guinea is in the middle of a delicate transition towards greater political and macroeconomic stability.** Guinea remains one of the poorest countries in the world with a per capita GDP of about US\$492 in 2013 and a population of 11.7 million. After years of instability, political isolation and military rule, Guinea has made considerable progress in restoring normalcy over the last four years. Guinea adopted a new constitution and fully re-integrated into the international community. Macro-economic stability was restored through prudent monetary and fiscal policies, and debt sustainability dramatically improved after the Highly Indebted Poor Countries (HIPC) completion point in 2012. Economic growth has increased, averaging close to 3 percent from 2010 to 2014. However, poverty has worsened in recent years with the 2012 Limited Poverty Evaluation Survey showing that 55 percent of the population is considered to be poor, compared with 53 percent in 2007 and 40 percent in 1995. Building on its vast endowment of natural resources (including both mining and hydropower), Guinea has now embarked on a path of long term development.



10. **In Guinea-Bissau, elections restored constitutional order in early 2014, following a military coup in April 2012, creating the conditions for a resumption of economic growth.** The military coup plunged the economy of Guinea-Bissau into recession, as donors suspended their operations and the transition government mismanaged the cashew campaigns of 2012 and 2013. The cashew sector accounts for the vast majority of production and employment and employs most of the country's poor—where poverty at the national poverty line exceeds 70 percent. The return to democracy in 2014 was accompanied both by a better cashew campaign and the resumption of donor support, improving the economic outlook for this poor economy with a GNI per capita of US\$520 (Atlas method) and a population of about 1.7 million.

11. **Senegal aspires to be an emerging economy by 2035, but has been in a weak-growth equilibrium since 2006.** With a population of about 14 million in 2013, a poverty rate of 46.7 percent in 2011, and a per capita GDP of US\$1,072 in 2013, Senegal has not shared the rapid growth experienced by many other SSA countries over the last decade. Compared to an average growth rate of 6 percent in the rest of SSA, growth in Senegal averaged only 4 percent between 2000 and 2010, with population growth at 2.5 percent. Senegal's democratic tradition has been strengthened by the March 2012 presidential elections.

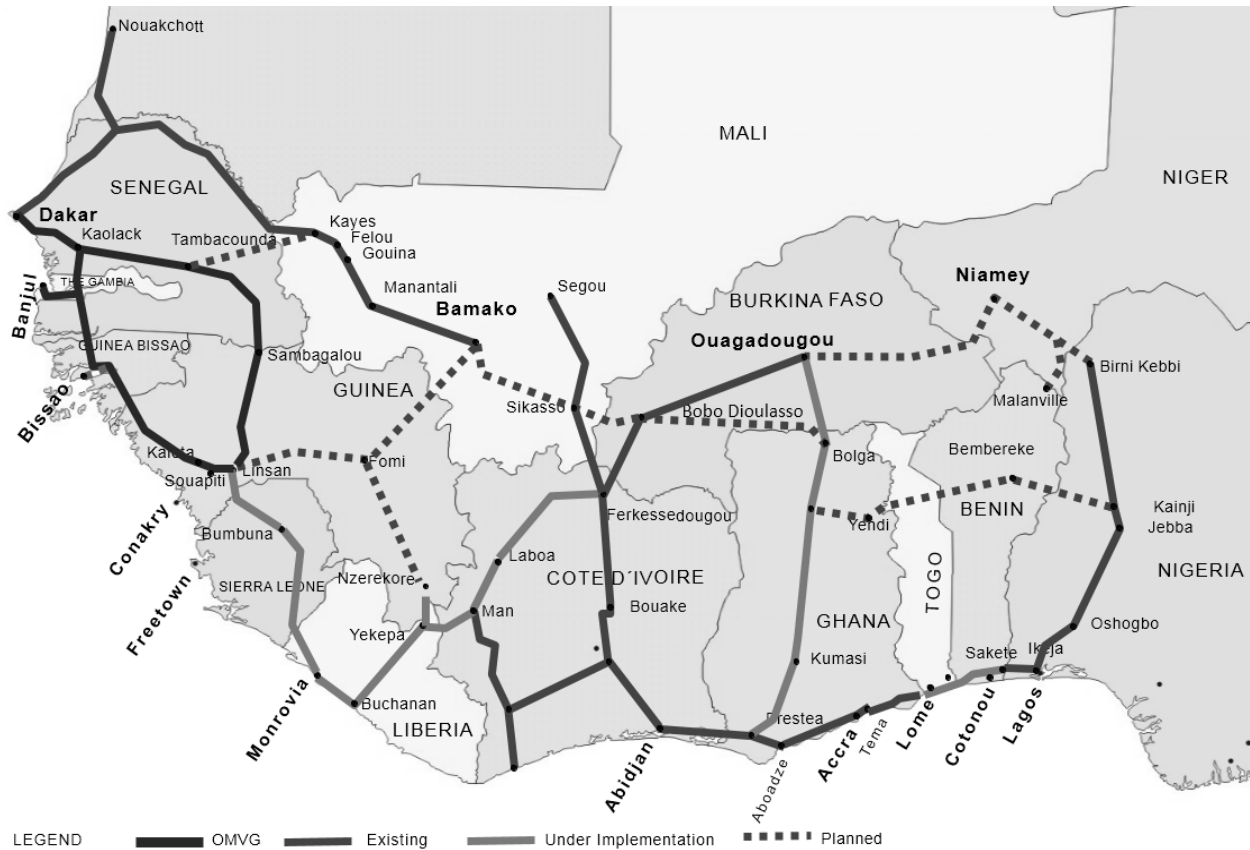
12. **The Ebola epidemic has had a significant negative impact and threatens to hinder prospects to reduce poverty and macroeconomic stability in the sub region.** Ebola has already had serious adverse economic effects on Guinea in particular, straining the country's healthcare system and generating huge fiscal pressures as revenues have contracted and expenditures have increased. Economic growth has been revised downward from 4.5 percent to 0.5 percent of GDP in 2014. Senegal has faced one Ebola case, but has been able to contain the disease. All four countries have felt the impact of the disease, with the tourism industry in Guinea-Bissau also being impacted. If not contained, Ebola could have a serious adverse impact on economic performance over the medium term and lead to pronounced economic contraction in 2015 and onward.

## **B. Sector Context**

13. **Despite significant energy resources, West African countries continue to have low rates of electricity access.** Energy resources in West Africa are concentrated in a few countries. 170 million people in ECOWAS countries lack access to electricity. ECOWAS countries are also among the lowest in the world in terms of electricity consumption, at approximately 160 kWh per capita. Power outages are frequent in many countries leading the private sector to invest widely in backstop generation or absorb serious losses in sales.

14. **Regional integration of the power systems in ECOWAS will facilitate large-scale development of the region's cost-effective and clean hydropower and natural gas resources.** Guinea's 6,000 MW of hydropower potential could be a source of sustainable power supply in West Africa. Also, gas along the coast from Cote d'Ivoire to Nigeria and in Mauritania can be converted into power. The cost of producing thermal power using liquid fossil fuels can reach US\$0.50 per kWh compared to US\$0.05-10 per kWh for hydropower and US\$0.15-20 per kWh for gas-to-power generation.

**Figure 1: The WAPP Network by 2020**



15. **Completion of the OMVG represents a critical step of interconnection of the WAPP network from Nigeria to Senegal by connecting the existing OMVS<sup>2</sup> network to the north and the CLSG<sup>3</sup> network to the east (Figure 1).** Much progress has been made on developing the WAPP transmission backbone with many interconnections being finalized or under construction. Once the CLSG interconnector is completed, the networks of Guinea will be connected to the Southern Backbone of Ivory Coast-Togo-Benin-Nigeria. Once the OMVG project is completed, this integration will reach up to Senegal.

16. **The OMVG grid will allow for the transfer of surplus generation from the country/region with lower future generation costs to the system with the higher generation costs.** The Gambia, Guinea-Bissau, and Senegal are highly dependent on expensive liquid fuel thermal generation, while Guinea has a large hydropower potential. Aggregating demand from OMVG countries will enable the development of competitively priced power supply capacity through economies of scale.

17. **This is the right time to proceed with the OMVG interconnection.** The OMVG interconnection project was originally conceived in the 1990s and several efforts have been made

<sup>2</sup> OMVS stands for Organisation pour la Mise en Valeur du fleuve Sénégal.

<sup>3</sup> CLSG stands for Cote d'Ivoire-Liberia-Sierra Leone-Guinea.

to implement it. Previous efforts have failed due to various factors, including political instability in the sub-region, lack of political consensus, and lack of financing. There is now strong political support for the project and a financing plan that includes sufficient financing from eight donors. A number of generation projects are being constructed so the line does not risk becoming a stranded asset.

**18. While all OMVG countries are currently facing generation deficits this is expected to change in the coming years.** The 240 MW Kaleta hydro plant in Guinea will come online in 2015. Thirty percent of its generation capacity is reserved for exports to OMVG neighbors. The Sambangalou hydropower project in Senegal/Guinea<sup>4</sup> is expected to come online in 2020. The OMVG Council of Ministers signed a power sharing agreement for Kaleta and Sambangalou in 2012. Term sheets for Power Purchase Agreements (PPAs) and Transmission Service Agreements (TSAs) have been agreed between ministers in early 2015. Several other projects are expected to come online. The 140 MW Gouina hydropower project in Mali will come on line in 2019. Several projects are under development in Senegal. The confirmation of the financing for the OMVG interconnector will spur regional power development, especially hydropower development in Guinea, by providing visibility on future larger off taker markets for independent power producers (IPPs)

**19. The power sector in Senegal is relatively advanced but suffers from financial shortfalls, while the power sector in The Gambia, Guinea, and Guinea-Bissau is underdeveloped.** The economies of all four countries have been held back by a power infrastructure deficit. Governance challenges have also impeded economic growth necessary to reduce poverty in a sustainable manner. Key electricity sector data for each utility is summarized in Table 1. A description of the state of the electricity sector and the benefits of the OMVG interconnection for each country follows below the table.

**Table 1: Summary of Key Electricity Sector Statistics for OMVG countries**

	The Gambia (2013)	Guinea (2012)	Guinea-Bissau (2013)	Senegal (2013)
<b>Access rate (%)</b>	35%	12%	19%	57%
<b>Utility</b>	NAWEC	EDG	EAGB	SENELEC
<b>Installed Capacity (MW)</b>	102 MW	235 MW	11 MW	757 MW
<b>% Thermal</b>	100%	45%	100%	90%
<b>% Hydro</b>	0%	55%	0%	10% (OMVS imports)
<b>Available Capacity</b>	45 MW	160 MW	5.5 MW	618 MW
<b>Peak Demand (MW)</b>	75 MW	277 MW	58 MW	487 MW
<b>Utility financials</b>				

<sup>4</sup> Note that the reservoir of Sambangalou will span Guinea and Senegal (82 percent in Guinea, 18 percent in Senegal), while the power plant will be located in Senegal, hence Senegal will be the exporting country.

<b>Estimated cost of supply (US\$ / kWh sold)<sup>5</sup></b>	\$0.50	\$0.19	n/a	\$0.31
<b>Average tariff (US\$ / kWh sold)</b>	\$0.33	\$0.12	\$0.40	\$0.24
<b>Average revenue (US\$ / kWh sold)</b>	\$0.30	\$0.11	n/a	\$0.24
<b>Utility operational efficiency indicators</b>				
<b>Bill collection rate</b>	90%	87%	90%	81%
<b>T&amp;D losses</b>	20%	41%	47%	18%
<b>Customers per employee</b>	75	114	89	387
<b>Reference alternative energy sources</b>				
<b>Reference Cost (US\$ / kWh)<sup>6</sup></b>	\$0.40-\$0.50	\$0.10	\$0.40-\$0.50	\$0.20
<b>Reference Plant</b>	Small scale diesel unit	Kaleta	Small scale diesel unit	Tobene

n/a = data not available

## **The Gambia**

20. **Access to electricity is approximately 35 percent in The Gambia, where electricity is expensive and supply is insufficient to meet demand.** Power supply within The Gambia is provided by the National Water and Electric Company (NAWEC), a vertically integrated state-owned utility. Cost of supply remains one of the highest in Africa (US\$0.50 per kWh sold in 2013) as 99 percent of generation capacity depends on imported liquid fuel. In 2013, average revenue was US\$0.30 per kWh sold. While the sector is subsidized to bridge some of the gap between cost and revenues, the utility is not able to spend adequate resources on maintenance, and in 2013 only 45 MW of an installed 102 MW was operational. Technical and commercial losses stood at 20 percent in 2013, but bill collection rates have improved to 90 percent in 2013 with the introduction of pre-paid meters. IDA is currently financing the development of an energy sector strategy and is preparing a new national energy project.

21. **OMVG represents a strategically critical means for The Gambia to close its supply/demand gap and reduce the average cost of supply.** OMVG offers The Gambia a low cost means to expand base load capacity by 55 MW (40 percent of forecasted demand in 2020). The Gambia will be able to access new capacity at a cost of US\$0.09-0.15 per kWh, compared to its alternative of power from small diesel plants at US\$0.30-40 per kWh. This will reduce average cost of supply in The Gambia by at least 20 percent.

## **Guinea**

22. **Despite abundant hydropower potential, access to electricity in Guinea is only 12 percent.** Responsibility for the sector lies with the Ministry of Energy and Hydraulics (MEH). *Electricité de Guinée* (EDG), the state-owned utility owns 107 MW of thermal generation capacity

<sup>5</sup> The financial cost of supply including the full value chain (generation, transmission and distribution), and all operating and capital costs. Note this is likely an underestimate of the full cost of supply because all costs may not be reflected in the utility financial statements, e.g. capital investments may be financed through the state.

<sup>6</sup> Includes a \$0.02 transmission cost

and 128 MW of hydropower generation capacity. Only 30 percent of the installed thermal capacity is currently operational. Technical and commercial losses are approximately 41 percent. EDG has resorted to rolling blackouts as a result of a significant shortfall in power generation and frequent network breakdowns. In 2012, EDG lost US\$0.07 for every kWh it generated. While the average tariff was US\$0.12 per kWh, the average cost of supplying the end users was US\$0.19 per kWh. IDA is supporting the turnaround of EDG through a management contract and infrastructure investment under the Guinea Power Sector Recovery Project (P146696, US\$50 million), as well as through the Guinea Electricity Sector Efficiency Improvement Project (P077371, US\$25.5 million), which seeks to improve the electricity sector's commercial and operational efficiency.

**23. The OMVG interconnection will contribute to the Government of Guinea's energy strategy set out in the 2012 Energy Sector Policy Letter – General Policy Declaration.** It will help to develop and monetize the country's significant hydropower potential. The long-term marginal cost of developing this generating capacity is around US\$0.06-US\$0.08 per kWh, significantly below that of neighboring countries. The transmission infrastructure will also enable future electrification of new regions within Guinea.

### **Guinea-Bissau**

**24. Only 19 percent of the population of Guinea-Bissau has access to electricity.** *Electricidade e Aguas da Guine-Bissau* (EAGB) is the state owned electricity utility providing services. The Ministry of Energy and Industry is responsible for oversight of EAGB. The electricity grid in Guinea-Bissau is limited to the capital, Bissau, yet 75 percent of the population lives outside Bissau. Total electricity supply costs are exorbitant as EAGB is fully dependent on high cost imported liquid fuel, and technical and commercial losses are about 47 percent. Despite high average tariffs of US\$0.40 per kWh, EAGB is not able to recover costs making expenditure on maintenance difficult. Generation capacity is currently 11 MW (down from 25 MW in 2000), of which only 5.5 MW is available. The new government has made considerable efforts to increase the available capacity. Peak demand was estimated to be 58 MW in 2013. IDA is supporting the improved performance of the energy sector through the Emergency Electricity and Water and Electricity Rehabilitation Project (P120910 original and P125374 additional financing, total of \$14.9 million), and the Emergency Water and Electricity Services Upgrading Project (P148797, US\$22.5 million), which includes an emphasis on improving customer management and revenue collection through the installation of pre-paid meters.

**25. The OMVG interconnection represents a critical infrastructure for Guinea-Bissau to access competitively priced and clean base load generation.** The OMVG interconnection contributes to the government of Guinea-Bissau's 2010 energy strategy. The strategy prioritizes increasing the capacity of electricity generation, and specifically highlights the OMVG interconnection as a medium term priority to access lower cost electricity (access to lower cost base load capacity against an available supply of 5.5 MW). At commissioning of the OMVG interconnection, Guinea-Bissau will be able to import 28 MW<sup>7</sup> of capacity which will help to close the supply demand gap and substantially reduce the cost of generation. Access to imports via the interconnection is estimated to reduce cost of supply in Guinea-Bissau by 30-50 percent. The OMVG interconnection will also provide backbone infrastructure that will enable electrifying

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<sup>7</sup> From Kaleta and Sambangalou

other parts of the country beyond Bissau. In addition, the OMVG interconnection will enable the development of domestic hydropower resources including the 20MW Saltinho Hydropower plant.

### **Senegal**

26. **Senegal's electricity sector is relatively advanced, but has been facing financial challenges created in part by a dependency on expensive imported fuel.** Responsibility for the energy sector lies with the Ministry of Energy. The access rate to electricity is 57 percent, relatively high for the region. Senelec is a state owned national electricity utility which has a monopoly for transmission, owns about half of the generation capacity. Distribution is shared with a number of rural concessionaires. The remainder is owned by IPPs. Thermal generation capacity using imported liquid fuels account for 90 percent of installed capacity. The remaining 10 percent of power is imported through the OMVS grid. Senegal's electricity tariffs are among the highest in Africa, and collected revenues of US\$0.24 per kWh in 2013 do not cover the full financial cost of supply of approximately US\$0.31 per kWh in 2013. The Government of Senegal is implementing a sector strategy to phase out subsidies, through diversification of the energy mix, increase in revenues, and improvement of the efficiency of service delivery. The World Bank Group is assisting the Government's effort to improve operational and financial performance of the transmission and distribution of electricity, including advisory services to support the reform of Senelec through the Senegal Electricity Sector Support project (P125565, US\$94 million).

27. **The OMVG interconnection will improve Senegal's security of supply and reduce the average cost of generation.** The OMVG interconnection is aligned with the 2012 Letter of Development Policy for the Energy Sector. The OMVG interconnection will initially provide 110 MW of capacity (15 percent of forecasted demand in 2020). An additional 400 MW of capacity is projected to be made available in later phases, accounting for 30 percent of forecasted demand in 2025. The OMVG interconnection is expected to provide electricity priced at US\$0.9-0.15 per kWh, which is a significant cost reduction to reference alternative sources expected to deliver energy at an estimated US\$0.16-0.20 per kWh. The OMVG interconnection will provide a transmission backbone to Tambacounda, a strategically important region with rich mining potential. The interconnection also offers a means to reach the isolated Casamance region.

### **C. Higher Level Objectives to which the Project Contributes**

28. **The OMVG interconnection will contribute to the World Bank Group goals to end poverty and boost shared prosperity.** The recent paper "Directions for the World Bank Group's Energy Sector (Report No. 79597)" highlights energy as an important engine of economic growth, on which both poverty reduction and shared prosperity depend. Inclusive economic growth is the single most effective means of reducing poverty and boosting prosperity. Most economic activity would be impossible without energy. The proposed project will enable countries to have greater access to reliable and competitively priced electricity, which is essential for business development, job creation, income generation, and international competitiveness.

29. **The project contributes to the 2011 Africa Region Strategy and other regional strategy papers.** The Africa Region Strategy vision articulated the need for regionally integrated infrastructure including in the provision of energy services at globally competitive costs. The strategy also underlines the importance of linkages between the energy sector and strategic sectors

in the Africa region. For example, access to lower cost energy is highlighted as an essential condition for improving the competitiveness of farming businesses. In addition, the project is aligned to the Regional Integration Assistance Strategy (RIAS) that aims at financing activities that improve access to clean energy and supply reliability. Finally, the project has been considered as a priority project within the Program for Infrastructure Development in Africa (PIDA), led by the African Union Commission.

**30. The activities proposed under this project are also well aligned with the World Bank's strategies in each of the countries that aim for improved access to affordable electricity.** In Senegal, the World Bank Group joint Country Partnership Strategy FY13-17 (Report No. 73478-SN) identifies that approximately 90 percent of the existing electricity supply capacity relies on oil imports and a priority is for the Bank to support the Government with its efforts to improve the energy mix. In the World Bank Group Country Assistance Strategy for Guinea FY14-17 (Report No. 76230-GN), strategic objective two highlights the need for urgent investments to improve the reliability of energy services and to support the development of the hydropower potential. The 2<sup>nd</sup> Joint IDA/IFC/AfDB Partnership Strategy for The Gambia FY13-16 (Report No. 72140-GM) identifies the high cost and the lack of availability of electricity as a serious constraint to enterprise development. The OMVG project is directly referenced. Likewise in the World Bank Group joint Interim Strategy Note for Guinea-Bissau FY14-15, the OMVG interconnection is identified as a major medium term goal.

## **II. PROJECT DEVELOPMENT OBJECTIVES**

### **A. PDO**

**31. The project developmental objective is to enable electricity trade between The Gambia, Guinea, Guinea-Bissau, and Senegal.**

#### **Project Beneficiaries**

**32. The direct project beneficiaries are the consumers of electricity provided by power utilities in the Republics of The Gambia, Guinea, Guinea-Bissau, and Senegal.** With an increase in electricity supply, households will have more reliable access to energy and will improve the competitive edge of firms in each country, create jobs, and spur economic growth. Households and businesses are also expected to benefit from high speed broad band connectivity to the four countries through access provided by the fiber optic cable included in the interconnection.

#### **PDO Level Results Indicators**

**33. The key PDO Level Results Indicators for the OMVG project are the following:**

- Electricity Trade (Export/Import) Capacity of Senegal (KVA)
- Electricity Trade (Export/Import) Capacity of Guinea (KVA)
- Electricity Trade (Export/Import) Capacity of Guinea-Bissau (KVA)
- Electricity Trade (Export/Import) Capacity of The Gambia (KVA)
- Institutional structure to facilitate electricity trade (Composite Index)
- Project beneficiaries (number, including of which female)

34. Annex 1 presents the results framework for the project.

### III. PROJECT DESCRIPTION

#### A. Project Components

35. The **proposed project will support the extension of the transmission network among member states of the OMVG and provide technical assistance (TA) to support project implementation and operation of the transmission facilities**. The OMVG interconnection consists of: 1,677 km of power transmission line in 225 kV;<sup>8</sup> 15 substations HV / MV for powering loads from national utilities; and two dispatching centers (see Figure 2 below). The project will also partly finance the operations and maintenance (O&M) contract costs for the first five years of operations (FY2018-2022).

36. There are two components for the proposed OMVG interconnection project:

37. **Component 1: Extension of WAPP transmission network – OMVG Interconnection (Component cost US\$586 million, IDA credit US\$163 million)**. This component is comprised of the following sub components:

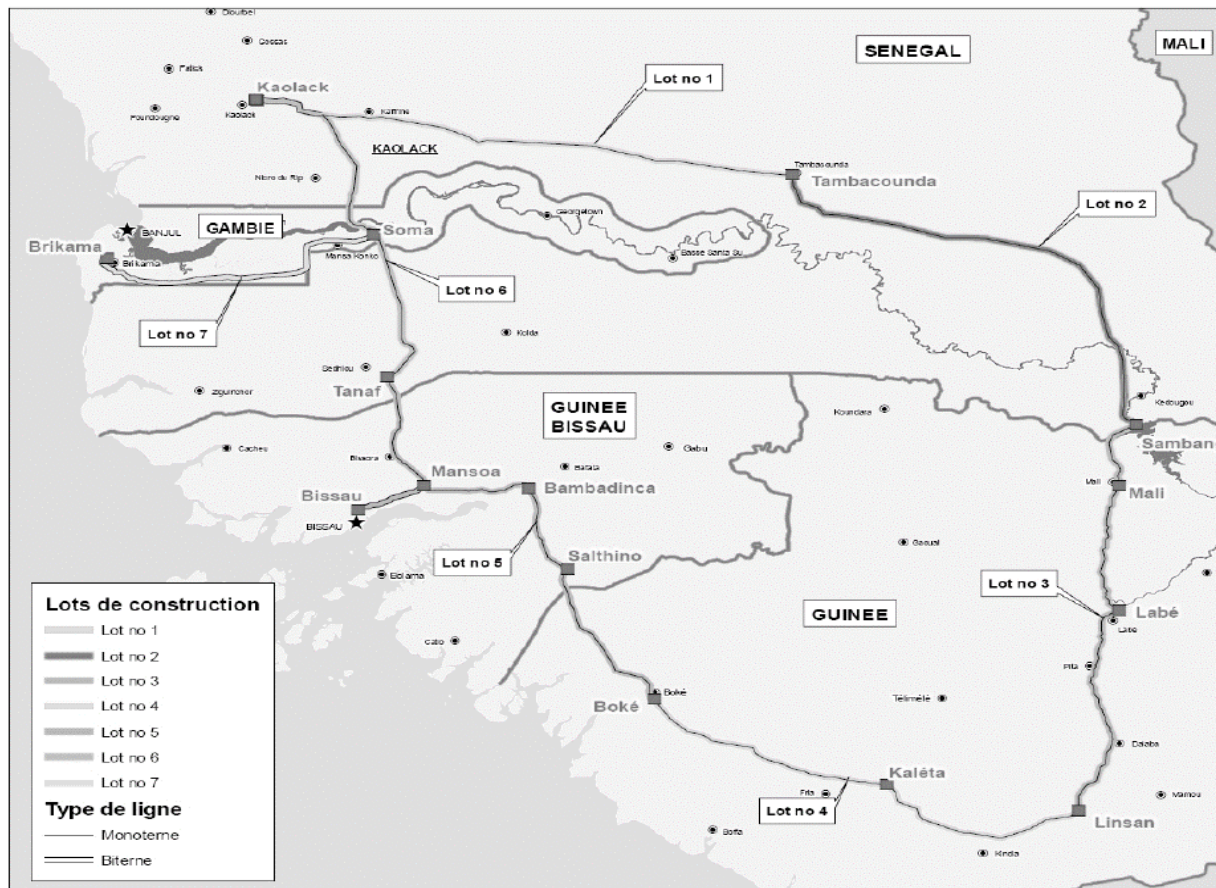
- (i) **Sub-Component 1.1: Transmission lines (sub-component cost: US\$397 million, IDA credit US\$140 million)**. The project will finance the construction of 1,677km of 225 kV transmission network capable of handling 800 MW. The IDA credit will finance the construction of 566km of 225 kV transmission lines interconnecting the electrical networks of the four countries of the OMVG. One of the ground wires will be equipped with a fiber optic cable (24 pairs). Excess fiber communications capacity will be available for renting to public communications enterprises. IDA financing will co-finance Lot 5, Lot 7, and Lot 6 between Soma and Tanaff (see Figure 2).
- (ii) **Sub-Component 1.2: Substations (sub-component cost: US\$189 million, IDA credit US\$23 million)**. The project will finance the construction of fifteen 225/30 kV Substations and dispatching centers on the interconnection (located in the corresponding Substation). The IDA credit will finance the engineering and construction of two 225/30 kV Substations in Guinea-Bissau (Bambadinca and Saltinho).

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<sup>8</sup> One of the ground wires will be equipped with a fiber optic cable (24 pairs).



**Figure 2: The OMVG Interconnection**



**38. Component 2: Technical Assistance to OMVG (Component cost US\$112 million, IDA credit US\$37 million).** This component is comprised of the following sub components:

(i) **Sub-Component 2.1: Implementation Support (sub-component cost: US\$92 million, IDA credit US\$17 million).** This sub-component finances costs of the Project Management Unit (PMU), project supervision costs including the owner's engineer, costs associated with implementing the Environmental and Social Management Plan (ESMP) and Resettlement Action Plans (RAPs), internal audits, TA related to the fiber optic cables, as well as further study of how to strengthen or mainstream collaboration between OMVG and OMVS. The IDA credit will finance retention of an experienced project management firm to manage the PMU on behalf of OMVG (more below and in Annex 3 on implementation arrangements) (*ATMO – Assistance Technique à la Maîtrise d'Ouvrage déléguée*), ESMP implementation costs, internal audits, and TA for the fiber optics, as well as the further study of how to strengthen or mainstream collaboration between OMVG and OMVS organizations, under the framework of the WAPP. Costs for national governments and national utilities to engage with OMVG through the monitoring and advisory committee are financed by the AfDB.

(ii) **Sub-Component 2.2: Operations and Maintenance support to OMVG Transmission Company (sub-component cost: US\$20 million, IDA credit US\$20 million).** To ensure sustainable performance of the transmission facilities, an Asset Management Agency (AMA) will be created under OMVG, which will contract a qualified company for the operations and maintenance (O&M) of the transmission infrastructure. This component will finance part of the O&M fees during the first five years of operation (expected FY2018-2022), on a sliding scale. Offtaker utilities will be required to pay their full bills from the date of commissioning of the OMVG interconnector. AMA will create an O&M dedicated account and, starting in the second year of operation, deposit part of the revenues from utilities into this O&M dedicated account. The balance of AMA revenues from utilities will be used to cover O&M costs and will be supplemented by IDA financing (IDA financing will not be transferred to the O&M dedicated account). In this way, at the end of the fifth year, the O&M dedicated account is estimated to contain resources equivalent to approximately 1.5 years of expected O&M expenditures.

## B. Project Financing

39. **The lending instrument is Investment Project Financing.** Financing agreements will be signed with each government. Each borrower elected to have retroactive financing of up to 20 percent of the amount available. Retroactive financing is available for eligible payments made after June 30, 2014.

40. **In addition to IDA, the project will be financed by French Development Agency (AFD), the African Development Bank (AfDB), the Islamic Development Bank (ISDB), the West African Development Bank (WADB), the European Investment Bank (EIB), the Kuwait Fund (KF), and the German Government (KfW) on a parallel financing basis.** The cost allocation for the investment component is based on the principle that each country will finance assets within its territory. Loans from donors will have relatively long maturities (13-40 years, median 25 years) and average interest rates of 1.67 percent. Each of the four governments will on-lend to OMVG and AMA, the implementing agencies, on the same financing terms. The four governments have also agreed to counterpart funds of approximately US\$16 million to finance interest during construction and compensation costs of the Resettlement Action Plan (RAP) under component 2.1 (Senegal US\$7 million, Guinea US\$3 million, Guinea-Bissau US\$5 million, and The Gambia US\$1 million).<sup>9</sup>

41. **Table 2 below presents a summary of the project costs and financing by source of financing.**

**Table 2: Project Cost and Financing (US\$m)**

	IDA	AfDB	ISDB	EIB	AFD	KFW	WADB	KF	States	Total
<b>Component 1</b>										
1.1 Lines	\$140	\$66	\$54	\$57	\$47	\$32	\$1	\$0	\$0	\$397
% of sub-component	35%	17%	14%	14%	12%	8%	0%	0%	0%	

<sup>9</sup> Breakdown between IDC and RAP respectively for each country approximately as follows: Senegal (\$6m / \$1m), Guinea (\$2m / \$1m), Guinea-Bissau (\$4m / \$1m), and The Gambia (\$0.6m / \$0.4m).

1.2 Sub-stations & dispatching	\$23	\$16	\$37	\$46	\$3	\$0	\$40	\$24	\$0	\$189
% of sub-component	12%	9%	19%	24%	2%	0%	21%	13%	0%	
Total Component 1	<b>\$163</b>	<b>\$82</b>	<b>\$90</b>	<b>\$104</b>	<b>\$50</b>	<b>\$32</b>	<b>\$41</b>	<b>\$24</b>	<b>\$0</b>	<b>\$586</b>
% of component	28%	14%	15%	18%	9%	5%	7%	4%	0%	
<b>Component 2</b>										
2.1 Implementation Support	\$17	\$52	\$3	\$2	\$2	\$0	\$13	\$0	\$3	\$92
% of sub-component	18%	56%	4%	3%	2%	0%	14%	0%	3%	
- of which RAP	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3	\$3
2.2 O&M	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20
% of sub-component	100%	0%	0%	0%	0%	0%	0%	0%	0%	
Total Component 2	<b>\$37</b>	<b>\$53</b>	<b>\$4</b>	<b>\$2</b>	<b>\$2</b>	<b>\$0</b>	<b>\$13</b>	<b>\$0</b>	<b>\$3</b>	<b>\$112</b>
% of component	33%	47%	3%	2%	2%	0%	12%	0%	5%	
Total Project financing	<b>\$200</b>	<b>\$135</b>	<b>\$94</b>	<b>\$106</b>	<b>\$52</b>	<b>\$32</b>	<b>\$54</b>	<b>\$24</b>	<b>\$3</b>	<b>\$698</b>
Other Expenditures										
Interest during construction									\$13	\$13
Total Project cost	<b>\$200</b>	<b>\$135</b>	<b>\$94</b>	<b>\$106</b>	<b>\$52</b>	<b>\$32</b>	<b>\$54</b>	<b>\$24</b>	<b>\$16</b>	<b>\$711</b>
% of project	28%	19%	13%	15%	7%	4%	8%	3%	3%	100%

Note: IDA financing includes 13% contingency costs.

42. A breakdown of IDA financing by country and by regional and national IDA allocations are shown in Table 3 below.

**Table 3: Regional and National IDA Allocation for IDA Financing (US\$m)**

	Regional IDA allocation	National IDA allocation	Total
The Gambia	\$44	\$3	<b>\$47</b>
%	93%	7%	
Guinea-Bissau	\$76	\$2	<b>\$78</b>
%	97%	3%	
Guinea	\$20	\$10	<b>\$30</b>
%	67%	33%	
Senegal	\$30	\$15	<b>\$45</b>
%	67%	33%	
Total	<b>\$170</b>	<b>\$30</b>	<b>\$200</b>
%	85%	15%	

### C. Lessons Learned and Reflected in the Project Design

43. The OMVG project has been designed taking into account broad lessons from the World Bank's experiences across Sub-Saharan Africa, particularly from the following Bank-financed projects focused on regional power interconnection and trade: WAPP-CLSG Power

Interconnection Project (P113266); Ethiopia-Sudan Interconnector (P074011); the Energy Service Delivery Project – Benin (P079633); and the Felou Hydroelectric Project – Mali (P114935).

44. **The following lessons learned from the implementation experience of these projects and ensuing country dialogue have informed the design of this project and arrangements to avoid implementation delays to the extent possible.**

**Table 4: Lessons Learnt from Previous Projects**

<i>Lessons</i>	<i>Reflection in Project Design</i>
<b>Design, Project Development Objectives and Indicators</b>	
(1) Lessons from projects show the importance of defining an appropriate and realistic Project Development Objective (PDO) as well as relevant outcomes and targets consistent with the PDO. An interconnection project creates the capacity to generate exports and revenues, as well as lay the groundwork for future interconnection opportunities. Indicators should not be restricted to levels of exports and revenues. Indicator targets should also take into account not only the interconnection's technical capacity but also the political economy risks and contractual delays.	(1) Based on the experiences of past projects, the PDO has been clearly and simply defined within the anticipated scope of the project to enable electricity supply to The Gambia, Guinea, Guinea-Bissau and Senegal through developing the interconnection infrastructure. Further, the key indicators and intermediate indicators are clearly measurable at the end of the project as well as modest in design.
(2) The design of the implementation timeline of the Ethiopia-Sudan Interconnector was comprised of two years of construction and two years of operation, which did not incorporate flexibility or a "soft start" for the start of the exports. When coupled with ambitious indicators, the rigid timeline contributed to lower achievements for the target indicators.	(2) The design of the project does not include trade indicators since the exports are beyond the control of the project. However, as part of the design, the project structure includes the signature of PPAs among the participating countries to ensure the initial trade.
(3) Line capacity – experience from other interconnection projects in the Africa region and other regions demonstrate the need to build line capacity with long term load development in mind. Many interconnections have been built to meet short term demand and have quickly become congested, resulting in the need for expensive expansion in the future that can also pose difficult Right of Way challenges.	(3) Capacity of the OMVG interconnection is designed with long term development in mind. Excess capacity is built into the design to allow for growth in supply volumes along the line.
<b>Project Implementation Capacity</b>	
(1) The ECOWAS Heads of State endorsed the establishment of "Special Purpose Companies" (SPC) as a major vehicle for the implementation of WAPP regional priority projects. The WAPP Joint Implementation Unit (JIC) set up the CLSG Regional Transmission Company (RTC) through a treaty among the States. The RTC is to design, construct, operate, maintain, and develop the CLSG line and will function as a supranational. However the CLSG RTC took several years to create since it had to be ratified in each parliament.	(1) The OMVG interconnection will be implemented by an existing institution, the OMVG. This will help to avoid project delays needed to create a new SPC to initiate project implementation.
(2) Uniform implementation of the entire transmission line: In the past, some Bank-financed WAPP	(2) The OMVG project will be implemented through the OMVG in the four countries in order to implement the

transmission line projects have relied on the existing power utilities to prepare the segment of the line that was located in their territory. This has led to delays of completion for the overall line, as different power utilities operated at different speeds. For the Ethiopia-Sudan Interconnection experience, the implementation arrangements included an effective combination of national entities and joint committees and working groups. The implementation framework and the underlying contractual agreements provided a strong platform for commitment, leadership, and project oversight.	entire transmission line in a uniform manner. A PMU will be set up within the OMVG which will be in charge of implementing the project. This way no one country will be responsible for carrying out the project within their territory, but rather the OMVG will be accountable for the development of the entire length of the transmission line, helping implement the entire transmission line in a uniform manner.
(3) Based on the Ethiopia-Sudan Interconnector experience, the construction delays prevented full implementation of all activities in the Supervision Engineers' contract by that date. The Ethiopian Electric Power Corporation (EEPCo) opted to allow the Engineer's contract to expire and have its own staff provide the remaining supervision. The decision constrained EEPCo's capacity for supervision of the remaining transmission and substations works and prevented the completion of the overseas training for EEPCo staff required to sustain and enhance their capacity in interconnection operations and power trade.	(3) Under the OMVG Interconnection project, the capacity of the OMVG as the implementing agency will be strengthened through sub-component 2.1. A project management firm will be retained to manage the PMU and ensure the overall coherence of the project. In addition, under the AfDB and WADB financing, a consultant firm will be retained to play the role of the owner's engineer in order to supervise the technical activities of the project. The owners engineer will be contracted and supervised by the OMVG, rather than the national utilities.
<b>Implementation Delays</b>	
(1) In the earlier WAPP program, implementation delays have been caused by a piecemeal approach to constructing the transmission line whereby each segment was subject to the responsibility of each country and respective national power utility.	(1) Against this backdrop, the OMVG project will be implemented and operated by a single supranational entity, the OMVG, which will oversee the construction of the entire line.
(2) In previous interconnection projects there have been a high number of effectiveness conditions that were not always meaningful (cross effectiveness, etc.).	(2) A more phased approach is used in the proposed project, combining effectiveness conditions critical for construction to commence, and legal covenants which capture important aspects of project design to be implemented in the future.
<b>Sustainability</b>	
(1) Lessons from past projects show that cross-border transmission line is a necessary condition for trade to take place, but not a sufficient condition to enable the flow of trades when excess power is not available to be traded on the line, leading to a lack of transmission line usage.	(1) There is a written agreement between the four countries to export a portion of the electricity generated by the first two hydropower plants which will become PPAs.
(2) Lessons from OMVS show how to create discipline of payment of bills by member utilities. In its first years of operations, OMVS experienced issues of delayed payment of bills by utilities, leading to a significant build-up of arrears and insufficient O&M funds. Since agreements in 2009, payments by utilities have not been an issue. To prevent arrears from building up again, SOGEM and the three utilities have agreed to: (a) Enforcement of resolution No. 470 of OMVS' Council of Ministers which requires that electricity supply be reduced and then cut if bills are not paid on time;	(2) This lesson is important in the context of OMVG where all four member utilities are in a weak financial position. There are three ways this project will mitigate the risk of non-payment of bills by utilities. First, the OMVG Council of Ministers will approve the term sheets of the PPAs including payment guarantees. Second, member utilities will put in place agreements similar in nature to those followed by OMVS member utilities to prevent build-up of arrears. Third, component 2.2 will help build a discipline of payment by utilities, while also protecting the quality operator from non-payment.



(b) Payment of new bills by bank draft fifteen days after reception of the bill; and (c) An electricity company which has not paid by that time will be bound by resolution No. 470 (i.e., reduction at 30% to 100% power supply) and will have to regularize its payment within ten days. Any future payment for this company will have to be made by a guaranteed bank draft.	
<b>Fiber Optic Cables</b>	
(1) The WAPP Secretariat and ECOWAS Commission commissioned several studies between 2008 and 2010 to identify the communications infrastructure requirements of the Power Pool Companies, and to ascertain to what extent existing fiber on power lines could be leveraged into an international fiber network for telecommunication purposes in the ECOWAS region.	(1) The OMVG project will incorporate a technical assistance related to the fiber optic cables of OMVG which will include a strategic study for the resale of excess capacity available, including a legal and regulatory analysis, a market study, a business model and a recommended implementation plan

## IV. IMPLEMENTATION

### A. Institutional and Implementation Arrangements

45. **The implementation agencies for the project will be the OMVG and the AMA.** The OMVG will be responsible for Component 1 – Extension of the WAPP transmission network, and Sub-component 2.1 – Implementation Support. The AMA will be the implementing agency for Sub-component 2.2 – O&M.

### Construction Phase

46. **The responsibility for the implementation of works has been entrusted to the OMVG in resolution 5/CM/35/B/G adopted by the OMVG Council of Ministers on August 2, 2008 in Banjul.** The OMVG will carry out project implementation through a PMU located within the OMVG Executive Secretariat. The PMU will be supported by an owner's engineer on technical aspects and by national and local monitoring committees for the purposes of facilitating, monitoring and supervising implementation activities on the ground, in particular monitoring the implementation of the ESMP.

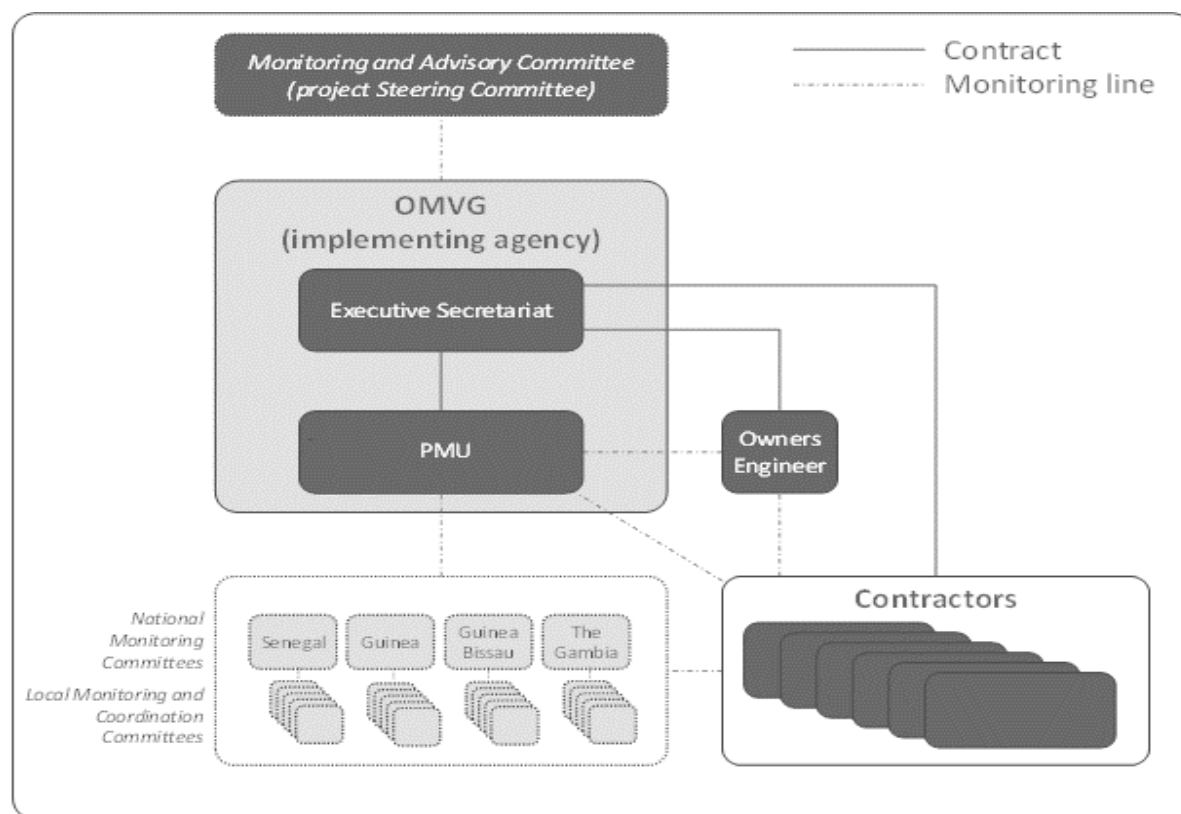
47. **The institutional and implementation arrangements during the construction phase are outlined in Figure 3.** In addition to resolution no 5/CM/35/B/G, in November 2013 in Conakry, the Council of Ministers took a decision authorizing the OMVG Executive Secretariat in collaboration with member States and donors to establish the: (i) monitoring and advisory committee (which will serve as the project Steering Committee), (ii) national monitoring committees, and (iii) local coordination and monitoring committees.

48. **Monitoring and Advisory Committee:** This Committee will serve as the project steering committee. It will have responsibility for strategic guidance and oversight of the project and will play a central role in the coordination, monitoring and orientation of project activities. It will comprise 19 members representing various project stakeholders as follows: the OMVG Executive Secretariat (Chair), heads of national OMVG units (4), national energy directorates (4), national electricity companies (4), finance ministries (4), WAPP (1), and a representative of Non-

Government Organization (NGO)s engaged in the environmental and social sectors (1). The secretariat of this committee will be assumed by the Coordinator of the PMU. The Committee will meet whenever necessary, but at least semi-annually during the construction phase.

49. **Project Management Unit:** Given the current limited project management capacity in OMVG, a PMU will be established under the OMVG Executive Secretariat. The PMU will be responsible for: (i) coordination and planning of the works; (ii) supervision and monitoring/control of the project activities; (iii) administrative and financial management; (iv) procurement activities; (v) implementation of safeguards measures; (vi) performing secretariat duties of the monitoring and advisory committee; and (vii) reporting on progress to donors and other relevant stakeholders. Management of the PMU will be delegated to an experienced project management firm<sup>10</sup> to be selected on a competitive basis financed by the technical assistance component of the project. In addition, the project management firm will be supported by a technical team financed by the AfDB. The structure of the PMU, comprising 36 positions, is shown in Annex 3.

**Figure 3: Institutional arrangements during construction phase**



50. **National Monitoring Committees:** each OMVG Member State will establish a National Monitoring Committee (NMC) that will be responsible for monitoring and supervising activities on the ground, including environmental and social monitoring and administrative, technical and financial facilitation. Each committee shall be chaired by the head of the OMVG national unit and shall comprise representatives of: the ministries in charge of energy, agriculture, local government,

<sup>10</sup> In French, this arrangement is referred to as *Assistance Technique à la Maîtrise d'Ouvrage déléguée (ATMO)*.

finance, and the environment as well as the national electricity company. The NMCs will be supervised and coordinated by the OMVG Executive Secretariat through the Monitoring and Advisory Committee. The PMU will provide progress reports on a regular basis to OMVG Executive Secretariat, who will update the Monitoring and Advisory Committee.

51. **Local Monitoring and Coordination Committees:** under the authority of NMCs, Local Monitoring and Coordination Committee (LMCCs) will be created in applicable local government units. The purpose of the LMCCs will be to monitor implementation of field activities including the ESMP and RPF.

### **Operations Phase**

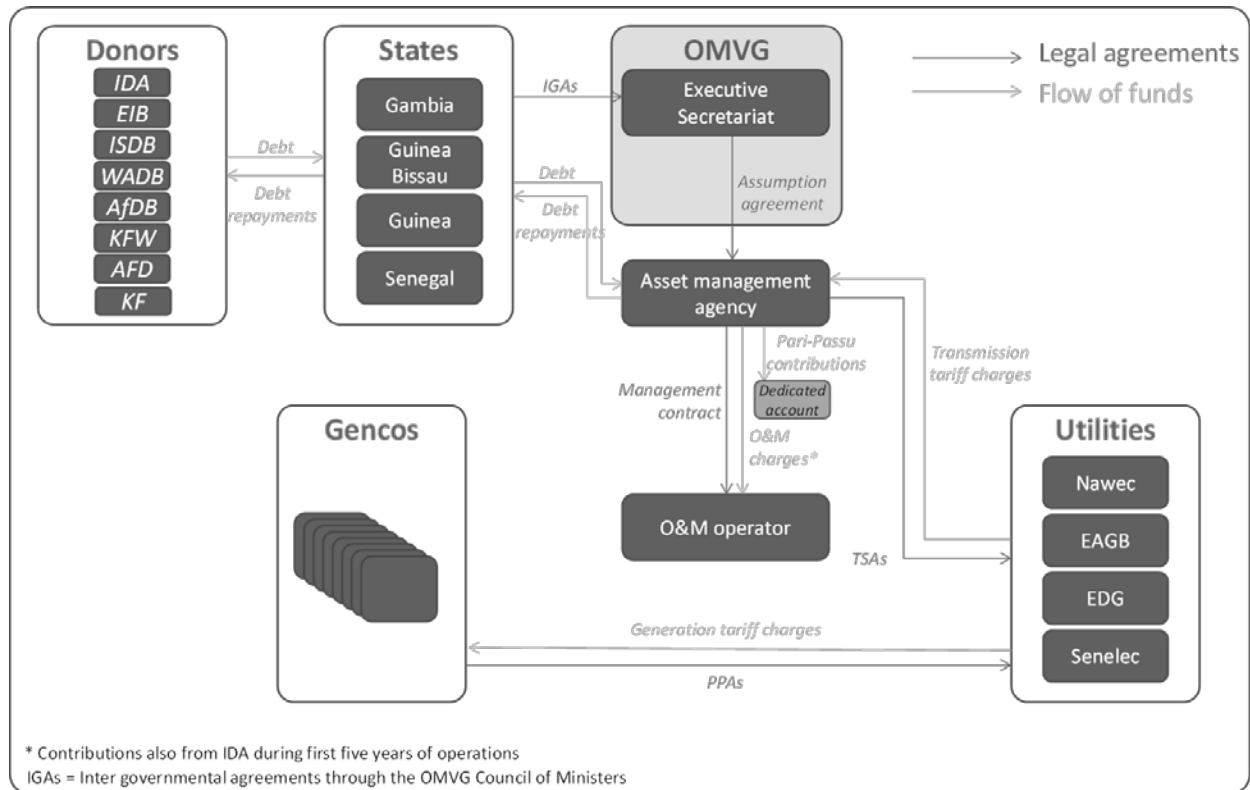
52. **The AMA will be the implementing agency for Component 2.2.** To avoid creation of new PMU at late stage with limited role, the AMA will appoint OMVG to perform its project implementation support responsibilities including (i) supervision and monitoring/control of the project activities; (ii) administrative and financial management; (iii) implementation of safeguards measures; and (iv) reporting on progress to donors and other relevant stakeholders. The AMA will be created through a Special Establishment Convention among the OMVG countries. The Special Establishment Convention will need to be ratified within 12 months of project effectiveness (project remedy). The establishment of AMA is a disbursement condition for component 2.2.

53. **The capacity of the OMVG is expected to be built through the project.** It will be reassessed during the project's mid-term review, including assessment of the capacity of OMVG to continue to perform all project implementation support activities on AMA's behalf. Staffing of the OMVG may have to be adjusted following the mid-term review.

54. **When the OMVG transmission infrastructure is commissioned and the network transitions from construction to operation, management of the assets and liabilities will transfer from OMVG to the AMA.** The AMA will be responsible for managing the operations of the system, billing and collecting revenues from transmission service agreements with each national utility, and meeting debt obligations to OMVG states. The overall contractual arrangements and financial flows during operations are shown in Figure 4.



**Figure 4: OMVG Transmission Network in Operational Phase –  
Contracts and Financial Flows**



55. **The signing of the Transmission Service Agreements (TSAs) between the AMA and each of the utilities using the transmission line** are expected to occur during project implementation as new generation assets are developed.

56. **AMA will contract a competitively selected qualified operator to ensure adequate operations and maintenance (O&M) of the network.**

57. **AMA will create an O&M dedicated account and, starting in the second year of operation, deposit part of the revenues from utilities into this O&M dedicated account.** The balance of AMA revenues from utilities will be used to cover O&M costs and will be supplemented by IDA financing on a *pari passu* basis. IDA funds will finance the qualified O&M operator and will not be transferred to the O&M dedicated account.

58. **Project implementation arrangements, while reflective of the complexity of the project, are designed to be as practical as possible.** Additional details on the project implementation arrangements can be found in Annex 3.

## **B. Results Monitoring and Evaluation**

59. **The OMVG will be responsible for results monitoring and evaluation.** Activities to be monitored include the timely and efficient construction and commissioning of the interconnection

loop, quality control and processing of payments to contractors approved by the owner's engineer, as well as the effective implementation of the ESMP and Resettlement Action Plans (RAPs), which will be prepared during project implementation and prior to works in line with the Resettlement Policy Framework (RPF).

**60. The OMVG will report on project progress on a quarterly basis using a single report format for monitoring progress on the project that has been agreed by the donors.** The quarterly report will contain information on the status of project implementation, financing, procurement, updated results indicators, and a detailed overview of awarded contracts and disbursements by contract and co-financiers. It will also include a tracking mechanism for the implementation of the ESMP and the RAP.

### **C. Sustainability**

**61. Cost reflective tariffs and the establishment of a financially ring-fenced AMA are key elements for the sustainability of the project.** Discipline of payments by utilities will be instilled through contracting mechanisms, including conditions for suspension of power supply in the event of non-payment. IDA financing for part of the O&M costs in the first five years of operations will allow AMA to build up about 1.5 years of revenues in reserve to ensure it will have sufficient funds to pay its bills even in case of late payment by one of the off-taker utilities or unexpected expenditures.

**62. Transmission tariffs will be determined on the basis of a single "postage stamp" price.** The tariffs will allow the AMA to generate enough revenue to cover the O&M expenditures and repayment of the debt. As the financing and maintenance costs of the interconnection network do not depend on volumes of power traded, the price per kWh will depend largely on the volume of traffic on the network. The "postage stamp" cost will be high in the beginning but is expected to go down as more power plants are constructed in the region. The specific rate will be set annually based on the expected traffic for the next year.

**63. Key for the sustainability of the project in the long term is to achieve financial viability of the project through trading along the system, and development of future projects in the sub-region.**

## **V. KEY RISKS AND MITIGATION MEASURES**

### **A. Overall Risk Rating and Explanation of Key Risks**

<b>Risk Category</b>	<b>Rating</b>
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	High

6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	High
9. Other – Sustainability (delays in generation coming online, and utility financial health)	High
<b>OVERALL</b>	<b>High</b>

64. **The overall risk rating for the OMVG project is high.** This is mainly due to the high risk country environments, and the following key risks:

65. **Project Stakeholder Risk.** The implementation of this project will involve four governments, 12 national institutions (at least two ministries and one utility company per country), and eight international donors. The risks of interference or undue influence are high at all levels in the decision chain. The main mitigation measure is the political agreement to have OMVG as the implementing agency, which will sign contracts and supervise implementation. As an existing regional institution, the time needed to create new institutions is avoided, delays in implementation are thus mitigated, and undue influence during implementation is minimized. The risk of delay and lack of coordination due to the involvement of multiple donors has been mitigated through regular bi-monthly meetings between donors as well as joint missions during project preparation. Joint missions are planned to continue during project implementation.

66. **Institutional Capacity for implementation and sustainability.**

(i) Implementation: this project will involve construction works in four countries. It requires effective coordination because the non-performance of one segment could detrimentally affect the rest. The OMVG has limited management capacity which could cause potential delays in procurement, difficulty coordinating with donors, and governance challenges. To mitigate these risks, the project provides for retaining an experienced project management firm, which will be responsible for managing the PMU to ensure that all technical, fiduciary, and safeguards aspects of the project are carried out appropriately.

(ii) Sustainability: the ability to attract a qualified sector operator to manage O&M of the transmission line and non-payment from the off-takers are key risks. To help attract a strong qualified operator and to mitigate the risk of non-payment from the off-takers, the project will contribute to O&M costs for the first five years of operations to enable AMA to build up a reserve to ensure future payments.

67. **Sustainability - lack of surplus energy to trade due to delays in generation coming online.** Delays in generation coming on line are a major risk to the project which could result in a high transmission tariff. In the short term, only limited surplus energy is expected to be available for trade which could result in high transmission tariffs. With a strong pipeline of regional projects, volumes are sufficiently high in the medium to long term to generate low transmission tariffs. However in the short to medium term, there is a high risk of transmission tariffs that may be difficult for national utilities to accept and pay. This risk is mitigated to some extent by the fact that, even in a low growth scenario, total energy cost is still expected to be lower than alternative energy sources in each country. The risk is also mitigated through ongoing support being provided

to national utilities through other projects. In particular for Guinea, IDA is supporting the development of the hydro pipeline through (i) the creation of a public private partnership (PPP) unit within the Ministry of Energy dedicated to developing hydro PPPs; (ii) the development of a hydro atlas to more accurately identify and map hydro projects; and (iii) the development of an investment prospectus which will have a strong focus on hydro projects.

68. **Sustainability - utility financial health.** The national power utilities of the four OMVG member countries will be the off-takers of power from the transmission line. Each utility suffers from lack of capacity and financial viability. The main mitigation measures are various projects financed by donors to enhance the performance of the national utilities in order to improve their performance. These include:

- (i) In the case of Guinea, IDA is financing the appointment of a management contractor for EDG under the Power Sector Recovery Project (P146696), which is expected to improve the financial health of EDG.
- (ii) In the case of The Gambia, IDA is supporting the long-term planning of NAWEC through the development of an energy sector strategy, which is expected to have a positive impact on NAWEC's financial health. A new IDA project is expected to be presented for Board approval in FY16.
- (iii) In the case of Guinea-Bissau, IDA is financing an Emergency Water and Electricity Services Upgrading Project (P148797), which is expected to decrease the cost of supply and reduce electricity losses and increase revenue collection through the installation of pre-paid meters, as well as the Emergency Electricity Water and Rehabilitation Project (P120910), which is expected to improve service delivery.
- (iv) In the case of Senegal, the World Bank Group is assisting the government's effort to improve operational and financial performance of the transmission and distribution of electricity, including IDA financed technical assistance to support the reform of Senelec through the Senegal Electricity Sector Support project (P125565). Power sector reforms also feature prominently in the development policy operations in Senegal.

## VI. APPRAISAL SUMMARY

### A. Economic and Financial Analysis

#### *Economic Analysis*

69. **The economic analysis for the OMVG Interconnector Project results in an economic internal rate of return (EIRR) of 17.03 percent for the four countries.** A sensitivity analysis shows that the EIRR is robust for changes in discount rates, oil prices, and overall project costs. The economic analysis estimates the net economic benefits of the OMVG interconnection by estimating the fuel and investment savings that would be achieved when the transmission line is built, relative to a "business as usual" case without the interconnection where countries fulfill the demand for electricity by developing power systems on a national basis. The economic analysis analyzed two main benefits including improved optimization of the generation investments and improved use of the generation capacity. The economic analysis assessed three scenarios: base

case growth in demand, low demand growth, and high demand growth. In each scenario, the cost savings resulting from the interconnection are estimated as the main economic benefit.

70. **Based on the difference in net present value (NPV) of both investment and operating costs for the four countries' electricity networks, the interconnection project has a positive NPV of US\$885 million (with a 10 percent discount rate) and an EIRR of 17.03 percent for the four countries under the base case scenario.** In the pessimistic scenario with low growth and significant delays to surplus energy being developed, the NPV of avoided costs is reduced to US\$255 million, with an EIRR of 12.26 percent. In the optimistic scenario, the NPV of avoided costs increases to US\$1.5 billion, with an EIRR of 22.9 percent. These results are driven by savings on operating expenses (notably fuel supply), which more than offset the increase in investment costs.

71. **A sensitivity analysis was carried out.** The results of the economic analysis are sensitive to underlying fuel prices as heavy fuel oil (HFO) and diesel are alternative sources of power generation without the interconnection. In the base case, a reference price of US\$80 per barrel (based on several industry forecasts) was used. At US\$50 per barrel, the NPV is reduced to US\$239 million with an EIRR of 13 percent. Additional details are provided in Annex 5.

72. **The project is expected to contribute positively to the reduction of carbon emissions.** A greenhouse gas (GHG) accounting analysis conducted for the interconnection estimates that net emissions reduction are estimated at 392ktCO<sub>2e</sub>, with a social value of US\$5.1 million (with a minimal impact on project EIRR).

73. **Justification of public financing.** The investment component of the project consists of construction of an interconnection loop that will remain state-owned. Transmission projects, unlike generation projects which may have potential for IPP arrangements, are generally difficult to finance privately due to their natural monopoly nature. Hence public sector financing is the most efficient and least costly financing mechanism under the existing institutional framework.

74. **Value added of World Bank support.** There are two added value benefits from the Bank's support. First, the role of the Bank in the OMVG interconnection project leverages the Bank's experience in neighboring countries and lessons learned from previous and ongoing regional interconnection projects, including OMVS and CLSG, as well as in other parts of the continent (see lessons learnt Table 4 for more details on how these lessons have been incorporated into the project design). Second, the involvement of IDA as the largest financier of the project is helping to leverage the participation of several other donors.

### ***Financial Analysis***

75. **The financial analysis confirms that the OMVG Interconnection Project will be financially viable although it will require high transmission tariffs in the short run for the AMA to recover its cost.** The project will have a financial internal rate of return (FIRR) of 3.84 percent, higher than the cost of capital (1.67 percent) and a financial net present value of US\$173 million. Details on the financial analysis and the revenue and tariff assumptions are included in Annex 5.

76. **The average transmission tariffs will have to be in the range of US\$0.01-0.05 per kWh for the newly formed AMA to be able to cover its operating costs, make provisions for the renewal of the assets, and to meet its debt service obligations.** The average power purchase cost of imported energy, including generation costs and transmission tariff, will be approximately US\$0.09-0.15 per kWh. This compares favorably to a cost for alternative sources of US\$0.20 per kWh in Senegal and US\$0.40-0.50 per kWh in Guinea-Bissau and The Gambia.

77. ***Financial Performance of the National Power Utilities.*** The utilities in Senegal, Guinea, Guinea-Bissau, and The Gambia are financially fragile. The power sector in each country is making losses due to a combination of high generation costs, low revenues, efficiency constraints of utilities, and high debt ratios. All national utilities in the four countries depend on government subsidies. The project is expected to alleviate some of the financial constraints on the national utilities since the cost of power import is expected to be less than the marginal cost of domestic generation.

## **B. Technical**

78. **The project uses well established technologies and presents no unusual construction and operational challenges.** The equipment and the technologies involved in construction and operation of transmission lines are well known and proven including in SSA. The design, including technical parameters and estimated project costs for the transmission line, have been established by a feasibility study prepared by reputable international engineering consultancy firms. An international consultancy firm is currently preparing technical specifications and tender documents.

79. **The project costs are based on the feasibility study developed in 2008, updated by in 2013 taking into consideration possible price variations in input costs for transmission lines and substations from 2008 to 2013.** The cost estimates have been appraised and are deemed to be in line with current market prices. Taking into account the possibility of relative cost increases based on the final route alignment, the contingency amount has been estimated at 12 percent of the total cost for all the countries.

80. **As part of the project's implementation arrangements and as is common for these types of projects, an owner's engineer will be contracted.** The owner's engineer will be a reputable international engineering company and will help to ensure that construction is carried out in accordance with designs and international quality standards.

## **C. Financial Management**

81. **The overall financial management (FM) risk rating is assessed as Substantial and is expected to be Moderate once the mitigation measures are implemented.** A FM assessment of the OMVG concluded that the following issues need to be addressed to ensure adequate financial management arrangements: (i) FM staff will need to be hired and FM procedures need to be developed as part of the OMVG Operations Manual; (ii) staff of the OMVG Secretariat need to be made familiar with IDA financed-projects and FM procedures; and (iii) an internal auditor needs to be contracted. Details on the FM arrangements are included in Annex 3.

## **D. Procurement**

**82. The overall project risk for procurement is Substantial and is expected to be Moderate once the mitigation measures are implemented.**

**83. Procurement for the project will be carried out in accordance with applicable guidelines.** These include the World Bank's "Guideline: Procurement under IBRD Loans and IDA Credits" dated January 2011 (revised July 2014); and "Guidelines: Selection and Employment of Consultants by World Bank and Borrowers" dated January 2011 (revised July 2014), and the provisions stipulated in the Financing Agreement.

**84. In addition to IDA financing, for the procurement of works, goods and non-consultancy services, the following donors agreed to use World Bank procurement policies:** AFD, EIB, WADB, and KfW. ISDB and KfW financing will follow the respective procurement policies of ISDB. AfDB will follow their own procurement policies.

**85. The procurement assessment showed that the main issues/risks concerning the procurement activities for the project's implementation are:** (i) the multiple donors and, related to that, the multiple procedures to be used with parallel financing; (ii) lack of OMVG experience with the World Bank's procedures and needs to improve its capacity in procurement; (iii) the OMVG's existing operations manual does not take into account World Bank procurement procedures; and (iv) lack of procurement specialist with sufficient experience in World Bank procedures. A summary of the procurement capacity assessment is provided in Annex 3

**86. To address these risks, the project will finance three activities to improve OMVG procurement capacity:** (i) boost procurement capacity through senior ATMO staff; (ii) prepare procurement procedures as a chapter within the OMVG Operations Manual; and (iii) train the staff and technical experts involved in the project implementation in World Bank procurement procedures, including contracts management. In addition, for the procurement of investment components that OMVG is carrying out during preparation period, the OMVG is supported by a reputable international engineering consultancy firm financed by the AfDB under a technical assistance operation.

## **E. Social and Environmental (including Safeguards)**

**87. The project is classified as Environmental Assessment (EA) category B (partial assessment).** The potential negative biophysical and social impacts of the establishment of the right of way (RoW) of the transmission line and its 15 substations are expected to be moderate. The following safeguards policies are triggered: Environmental Assessment (OP/BP4.01), Natural Habitats (OP/BP4.04), Forests (OP/BP4.36), Physical Cultural Resources (OP/BP4.11), and Involuntary Resettlement (OP/BP4.12). Construction of infrastructure will also comply with World Bank Group Environmental, Health and Safety (EHS) guidelines on Electric Power Transmission and Distribution.

**88. The Environmental and Social Impact Assessment (ESIA) and ESMP were published as follows:** in the World Bank InfoShop on November 11, 2014, on the OMVG website on October 28, 2014, in Guinea-Bissau on November 27, 2014, in The Gambia on December 10, 2014, in

Guinea on December 8, 2014, and in Senegal on February 6, 2015. The RPF was published in the World Bank InfoShop on December 12, 2014, on the OMVG website on December 12, 2014, and was disclosed in all countries by February 11, 2015.

**89. The ESIA and the RPF completed during project preparation concluded that the overall environmental and social impact of the project is positive though some adverse impacts must be considered during the construction of the infrastructure and their exploitation.** The overall biophysical affected area will be about 6,700 hectares along the RoW, while the construction of each substation will require approximately 7.5 hectares of land. Public consultation meetings, including to discuss various compensation options, were held intermittently from 2006 through 2014 during project preparation.

**90. The safeguard policies listed above are triggered due to the following potential impacts:**

- 270 hectares (four percent of the project influence area) of gazetted forest areas or park forest will be cleared in The Gambia, thereby inducing temporary disturbance of terrestrial fauna and potential depletion of flora diversity; however no irreversible or high magnitude adverse impacts are related to the loss of natural habitats and terrestrial wildlife due to the RoW passing through the marginal areas of gazetted forests. Further review during appraisal of area data in consultation with the Gambia National Environmental Agency (NEA) confirmed this.
- 8,750 hectares of land will be permanently set aside for the construction and maintenance of project infrastructure. Of this, it is expected that the project will result in a loss of 8 hectares of agricultural land out of the 2,050 hectares directly impacted by the RoW and the substations. The remaining 6,700 hectares to be set aside represent the marginal areas around the RoW in which electromagnetic waves present potential health risks following construction of the transmission lines;
- Three houses potentially affected by the construction of substation in Labe (Guinea).
- Increased human pressure on the degrading of non-gazette forest ecosystems and savannahs because of increased access.
- Occupational diseases and risks during construction because of immigrant employees and non-compliance to safety measures.

**91. The project will finance the implementation of the Environmental and Social Management Plan (ESMP) and the Resettlement Policy Framework (RPF).** IDA will finance the non-compensation related aspects of the ESMP, to be implemented by OMVG. OMVG will be responsible, through the PMU, National Monitoring Committees, and Local Monitoring and Coordination Committees, for the implementation of the RAP(s) in the territories of the Member States. Compensation funds and associated relocation expenses will be financed by relevant states.

**92. World Bank Grievance Redress Mechanism.** Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could



occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).

## ANNEX 1: RESULTS FRAMEWORK

**Country: Africa**

**Project Name: OMVG Interconnection Project (P146830)**

### Results Framework

#### Project Development Objectives

The project development objective is to enable electricity trade between The Gambia, Guinea, Guinea-Bissau, and Senegal.

**These results are at** | Project Level

#### Project Development Objective Indicators

Indicator Name	Baseline	Cumulative Target Values (Calendar Year)								
		2015	2016	2017	2018	2019	2020	2021	2022	End Target
Electricity Trade (Export/Import) Capacity of Senegal (Kilovolt-Ampere (KVA))	0	0	0	0	222,000	222,000	222,000	222,000	222,000	222,000
Electricity Trade (Export/Import) Capacity of Guinea (KVA)	0	0	0	0	340,000	340,000	340,000	340,000	340,000	340,000
Electricity Trade (Export/Import)	0	0	0	0	170,000	170,000	170,000	170,000	170,000	170,000

Capacity of Guinea-Bissau (KVA)										
Electricity Trade (Export/Import) Capacity of The Gambia (KVA)	0	0	0	0	180,000	180,000	180,000	180,000	180,000	180,000
Institutional structure to facilitate electricity trade (composite index)	0	0	2	3	3	3	3	3	3	3
Project beneficiaries (number)	0	0	0	0	6,684,250	6,684,250	6,684,250	6,684,250	6,684,250	6,684,250
- <i>Of which female</i>	0	0	0	0	3,342,125	3,342,125	3,342,125	3,342,125	3,342,125	3,342,125

### Intermediate Results Indicators – Component 1

Indicator Name	Baseline	Cumulative Target Values								
		2015	2016	2017	2018	2019	2020	2021	2022	End Target
The ATMO is performing adequately (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A
Transmission lines constructed (Kilometers) – Core Sector Indicator	0	0	0	0	1677	1677	1677	1677	1677	1677

Number of substations constructed (Number)	0	0	3	10	15	15	15	15	15	15
Length of fiber optic network built (km)	0	0	0	0	1677	1677	1677	1677	1677	1677
Qualified Operator for the AMA (Yes/No)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Electricity Trade (Export/Import) Capacity of Senegal (KVA)	This indicator measures the installed capacity of the transmission infrastructure (firm installed capacity on substations) that enables importing or exporting electricity from/to OMVG countries. Measured through reports from the Owners Engineer and PMU.	Annual	Technical Reports	OMVG
Electricity Trade (Export/Import) Capacity of Guinea (KVA)	This indicator measures the installed capacity of the transmission infrastructure (firm installed capacity on substations) that enables importing or exporting electricity from/to OMVG countries. Measured through reports from the Owners Engineer and PMU.	Annual	Technical Reports	OMVG
Electricity Trade (Export/Import) Capacity of Guinea-Bissau (KVA)	This indicator measures the installed capacity of the transmission infrastructure (firm installed capacity on substations) that enables importing or exporting electricity from/to OMVG countries. Measured	Annual	Technical reports	OMVG

	through reports from the Owners Engineer and PMU.			
Electricity Trade (Export/Import) Capacity of The Gambia (KVA)	This indicator measures the installed capacity of the transmission infrastructure (firm installed capacity on substations) that enables importing or exporting electricity from/to OMVG countries. Measured through reports from the Owners Engineer and PMU.	Annual	Technical Reports	OMVG
Institutional structure to facilitate electricity trade (composite index)	Structures for the OMVG to facilitate electricity trade between the four OMVG countries are in place. This includes i) payments of transmission tariffs made within three months of invoice issued; ii) entities exist (AMA); and iii) capacity to dispatch (Dispatch Centers staffed). Measured annually by a composite index (0-3), with one point for each measure.	Annual	Technical Reports	OMVG
Direct project beneficiaries (number)	Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., children who benefit from an immunization program; families that have a new piped water connection). Please note that this indicator requires supplemental information. Supplemental Value: Female beneficiaries (percentage). Based on the assessment and definition of direct project beneficiaries, specify what proportion of the direct project beneficiaries are female. This indicator is calculated as a percentage.	Annual	Utility annual reports	OMVG
Female beneficiaries (number)	Based on the assessment and definition of direct project beneficiaries, specify what percentage of the beneficiaries are female.	No description provided.	No description provided.	No description provided.

### Intermediate Results Indicators – Component 2

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
The ATMO is performing adequately	This indicator measures the OMVG's ability to implement the project. It is measured by the project management firm delivering on its areas of responsibility including (i) coordination and planning of the works; (ii) supervision and monitoring/control of the project activities; (iii) administrative and financial management; (iv) procurement activities; (v) implementation of safeguards measures; (vi) performing secretariat duties of the monitoring and advisory committee; and (vii) reporting on progress to donors and other relevant stakeholders	Annual	OMVG report	OMVG
Transmission lines constructed, including fiber optics	This indicator measures the length of the transmission lines, including fiber optics, constructed for the specified distance	Annual	Consultant report	OMVG
Number of substations constructed	This indicator measures the number of substations constructed.	Annual	Technical reports	OMVG
Length of fiber optic network built	Core indicator. This indicator measures the cumulative number of kilometers of fiber optic backbone built under the project. This indicator measures the progress towards a fully redundant regional network	Annual	Technical reports	OMVG
Management Contractor for OMVG Transmission Company	This indicator measures OMVG's capacity to ensure an adequate operation and maintenance of the infrastructure financed under the project	Annual	Technical reports	OMVG

## ANNEX 2: DETAILED PROJECT DESCRIPTION

### AFRICA: OMVG Interconnection Project (P146830)

1. The proposed project is designed to support the expansion of the WAPP transmission network among Member States of the OMVG and in that connection will finance the construction of the related transmission lines and substations and the technical assistance to support project implementation and operation of the transmission facilities for the first five years. The OMVG interconnection will extend the western side of the WAPP transmission system from the CLSG interconnection to Senegal, connecting the electrical networks of the four OMVG countries. The loop consists of: 1,677 km of power transmission line in 225 kV<sup>11</sup>; 15 substations HV / MV for powering loads from national utilities; and 2 dispatching centers. See map Figure 2.
2. The interconnection is divided into 16 line sections. This number is defined by the presence of the 15 sub-stations, to which is added an additional disconnection point between Kaolack and Soma, near Birkelane (Senegal), at the location where two single circuit lines join to become a double circuit line.
3. Table 5 below shows the lengths of each of the sections.

**Table 5: OMVG Interconnection Sections**

Line Section		Line Length (km)		
No	Name	Single Circuit	Double Circuit	Total
1	Birkelane – Tambacounda	226.89		226.89
2	Tambacounda - Sambangalou	261.54		261.54
3	Sambangalou-Mali	45.06		45.06
4	Mali-Labé	82.29		82.29
5	Labé –Linsan	137.78		137.78
6	Linsan – Kaléta	110.12		110.12
7	Kaléta – Boké	127.89		127.89
8	Boké – Salthino	98.45		98.45
9	Salthino – Bambadinca	56.35		56.35
10	Bambadinca – Mansoa	52.90		52.90
11	Mansoa – Tanaff	73.47		73.47
12	Mansoa – Bissau		35.66	35.66
13	Tanaff – Soma	95.90		95.90
14	Soma – Birkelane	84.11		84.11
15	Birkelane - Kaolack		35.13	35.13
16	Soma – Brikama		153.80	153.80
<b>TOTAL</b>		<b>1452.75</b>	<b>224.59</b>	<b>1677.34</b>

<sup>11</sup> One of the ground wires will be equipped with a fiber optic cable (24 pairs).

4. The network of corridors has been designed to interlink the identified interconnection points to meet the requirements of the OMVG countries, as well as to foster an interconnection with existing networks in each country, the planned networks (ECOWAS) and/or existing (OMVS) in the sub-region. The choice of corridors has also taken into account the following constraints and general considerations that could have repercussions on the technical and environmental feasibility of the project and cost of implementation.

- a. To be as short and as direct as possible to minimize costs;
- b. To avoid crossing problem zones, involving non-standard and more costly technical solutions: large stretches of water, mountains, mangroves, etc.;
- c. To stay at a distance from urbanized sectors;
- d. To avoid crossing protected areas: parks, natural reserves, etc.;
- e. To avoid crossing tourist areas or important panoramic sites.

5. The line voltage of 225kV was initially determined in the 1997 report, and has been validated during the feasibility study of 2002 -2004. This level of voltage, that is now a standard for electrical power transmission networks in West Africa, is maintained.

6. The power wheeling capacity of the line was established considering a certain transmission capacity reserve. Since a transmission line has a life expectancy going beyond 50 years and that energy demand is difficult to evaluate over such a long period, the considered conductor for each sections aim to have the capacity to cope with the expected increase along the forthcoming years. Thus, different conductors have been proposed depending on the line sector (single or double circuit):

- a. For all single circuit sections and double circuit between Kaolack and Birkelane: aluminum alloy (AAAC), 570mm<sup>2</sup>, with two conductors per phase. This conductor presents amperage of approximately 1000A, which translated into a thermal transit of around 800MW for two conductors. Therefore, not only can more power be carried and regulation of voltage made easier, this conductor also offers a better transit reserve for all future expansions.
- b. For double circuit Mansoa-Bissau section: aluminum alloy (AAAC), 228mm<sup>2</sup>, with one conductor per phase. This conductor presents amperage of approximately 560A, which translated into a thermal transit of around 200MW for one conductor.
- c. For double circuit Soma-Brikama section: aluminum alloy (AAAC), 228mm<sup>2</sup>, with two conductors per phase. This conductor presents amperage of approximately 560A, which translated into a thermal transit of around 400MW for two conductors.

7. The line pylons will be equipped with two ground wires with one equipped with optic fiber. Two different types of guard wires shall be used: (a) ACSR type cable; and (b) CGFO type cable. Ground wires containing optic fibers (CGFO) will have 24 optic fibers.

8. Concerning the number of pairs of the fiber optic cable, the cables of the first generation often contain between 6 (e.g. SOGEM, Lesotho Electricity Company...) and 12 pairs, of which



usually 2 are equipped for communication purposes and used by the electricity company for its own internal communication. Currently, the cables are typically 24 pairs at least given that extra costs compared to 12 are negligible (e.g. SNEL in DRC).

9. OMVG Interconnection will also consist of 15 HV/MT substations. Each of the substations is identified in Table 6 below. These substations will be connected to a loop network whose aim is to supply electric energy to the four OMVG member countries.

**Table 6: List of stations for the project of Interconnection of the OMVG Countries**

No	Country	Substation	Voltage	MVA
1	Senegal	Sambangalou	225 kV	2x30
2		Tambacounda	225/30 kV	2x20
3		Kaolack	225/30 kV	2x40
4		Tanaff	225/30 kV	2x20
5	The Gambia	Soma	225/30 kV	2x15
6		Brikama	225/33 kV	2x75
7	Guinea-Bissau	Mansoa	225/30 kV	2x15
8		Bissau	225/30 kV	2x40
9		Bambadinca	225/30 kV	2x15
10		Salthino	225/30 kV	2x15
11	Guinea	Boké	225/30 kV	2x15
12		Kaléta	225/30 kV	2x40
13		Linsan	225/110/30 kV	2x75, 2x15
14		Labé	225/30 kV	2x25
15		Mali	225/30 kV	2x15

10. There are two components for the proposed OMVG interconnection project: Component 1: Extension of WAPP transmission network – OMVG Interconnection, and Component 2: Technical Assistance to OMVG.

11. **Component 1: Extension of WAPP transmission network – OMVG Interconnection (Project Cost US\$586 million; IDA credit US\$163 million).** This component is comprised of the following sub components: (a) Sub-Component 1.1. 225 kV Transmission lines, and (b) Sub-Component 1.2. Substations.

12. **Sub-Component 1.1. 225 kV Transmission lines (Project Cost: US\$397 million, IDA credit US\$140 million).** The project will finance the construction of 1,677km of 225 kV transmission network capable of handling 800 MW and connecting the electrical networks of the four countries of the OMVG. IDA credit will finance the construction of 566 km of 225 kV transmission network. The 566 km of transmission lines include construction of Lots 5 and 7 and Lot 6 between Soma and Tanaff. IDA financing will be used to construct transmission lines according to the following distribution: Senegal: 103.6 km; Gambia: 158.9 km; Guinea: 86.4 km, Guinea-Bissau: 217.6 km. Table 7 below shows all the lots, with components included under Bank financing shaded.

**Table 7: 225kV Lines by section and country**

Lot No	Length per Sections		Length per Country		Total Lot (km)
	Section	km	Country	Km	
1	Birkelane - Tambacounda	226.89	Senegal	226.89	226.89
2	Tambacounda - Sambangalou	261.54	Senegal	261.54	261.54
3	Sambangalou - Mali	45.05	Senegal	14.7	265.13
			Guinea	30.36	
	Mali - Labé	82.29	Guinea	82.29	
	Labé - Linsan	137.78	Guinea	137.78	
4	Linsan - Kaléta	110.12	Guinea	110.12	238.01
	Kaléta - Boké	127.89	Guinea	127.89	
5	Boké - Salthino	98.45	Guinea	86.43	316.83
			Guinea-Bissau	12.02	
	Saltinho - Bambadinca	56.35	Guinea-Bissau	56.35	
	Bambadinca - Mansoa	52.9	Guinea-Bissau	52.9	
	Mansoa - Tanaff	73.47	Guinea-Bissau	60.63	
			Senegal	12.84	
	Mansoa - Bissau	35.66	Guinea-Bissau	35.66	
6	Tanaff - Soma	95.9	Senegal	90.78	215.14
			The Gambia	5.12	
	Soma - Birkelane	84.11	The Gambia	23.91	
			Senegal	60.2	
7	Birkelane - Kaolack	35.13	Senegal	35.13	153.8
	Soma - Brikama	153.8	The Gambia	153.8	

13. *Type of line.* As described above, the line forming the network loop is single-circuit on triangular pylons at 225 kV voltage on all the sections except in the sections Mansoa-Bissau and Soma-Brikama that are equipped with a double circuit line.

14. *Type of conductor.* The proposed lines conductor will consist of:

- (i) 570 mm<sup>2</sup> aluminum alloy (AAAC) for all single circuits (377.1 km).
- (ii) 228 mm<sup>2</sup> aluminum alloy (AAAC) for the double circuit Mansoa-Bissau (35.66 km) and Soma-Brikama (153,8 km).

15. The lines will be equipped with two ground wires, one of them with optic fiber. Beyond the support of the teleprotection, remote control, and telecontrol of the electrical network, the OMVG optic fiber network will provide an additional contribution to the public telecommunications. Indeed, optic fibers are available for renting to public communications enterprises, much needed in the sub-region. Despite the opening up of the telecommunications sector and impressive mobile penetration growth, internet penetration remains very low in most

ECOWAS countries. Excess fiber communications capacity on the high voltage cross-border infrastructure of WAPP provides redundancy to existing routes to submarine cables and completes the missing gaps with the partially completed regional transmission networks operated by telecoms operators. Out of the four OMVG member states only Guinea-Bissau is not connected to submarine cables and would benefit from several options for improved international connectivity through the OMVG project.

16. The construction of an access road usable for the construction of the line and later for the supervision, inspection and maintenance, is anticipated where existing access is insufficient.

17. **Sub-Component 1.2. Substations (Project Cost: US\$189 million, IDA credit US\$23 million).** The project involves the engineering and construction of fifteen 225/13 kV Substations and two dispatching centers (located in the corresponding Substation) on the interconnection. The IDA credit involves the engineering and construction of two 225/30 kV Substations in Guinea-Bissau, located at Bambadinca and Saltinho.

18. Bambadinca substation's role is to supply a network of distribution for the nearby city. The substation is part of the main loop and includes:

**a. High voltage section**

- i. Two 225 kV-30 kV power transformers, of a capacity of 15 MVA each for the distribution;
- ii. Two 225 kV outgoing lines allowing the inclusion of the substation in the loop;
- iii. A 225 kV inductance shunt with a capacity of 20 MVA<sub>r</sub>;
- iv. A simple set of 225 kV bars that could be doubled at a later stage.

**b. Medium voltage section**

- i. Two incoming circuit breakers, 30 kV;
- ii. One tie breaker, 30 kV;
- iii. Two 30 kV bars;
- iv. Four outgoing circuit breakers, 30 kV;
- v. Two outgoing fused isolating switches for the auxiliary services transformers;
- vi. Two auxiliary services transformers each rated 200 kVA.

19. The Saltinho substation supplies power to the neighboring cities, and is part of the power loop. It comprises:

**a. High voltage section**

- i. Two 225 kV-30 kV power transformers, of a capacity of 15 MVA each for the distribution;
- ii. Two 225 kV outgoing lines allowing the inclusion of the substation in the loop;
- iii. A 225 kV inductance shunt with a capacity of 20 MVA<sub>r</sub>;
- iv. One simple set of 225 kV bars which can be doubled at a later stage;
- v. One 225 kV non-equipped spare outgoing bay, in reserve for connection with the Boé aluminum plant.

**b. Medium voltage section**

- i. Two incoming circuit breakers, 30 kV;
- ii. One tie breaker, 30 kV;

- iii. Two 30 kV bars;
- iv. Four outgoing circuit breakers, 30 kV;
- v. Two outgoing fused isolating switches for the auxiliary services transformers;
- vi. Two auxiliary services transformers each rated 200 kVA.

20. **Component 2: Technical Assistance to OMVG (Project Cost US\$112 million, IDA credit US\$37 million).** This component is comprised of the following sub components: (a) Sub-Component 2.1. Implementation Support; and (b) Sub-Component 2.2. Operations and Maintenance support to OMVG Transmission Company.

21. **Sub-Component 2.1. Implementation Support (Project Cost: \$92 million, IDA credit US\$17 million).** The Implementation Support component for the total Project includes costs of the Project Management Unit (PMU)<sup>12</sup>, project supervision costs including the owner's engineer (co-financed by the AfDB and WADB), costs associated with implementing the ESMP and RAPs, internal audits, TA related to the fiber optic cables, as well as the further study of how to strengthen or mainstream collaboration between OMVG and OMVS organizations. Costs for national governments and national utilities to engage with OMVG through the monitoring and advisory committee are financed by the AfDB.

22. IDA credit will provide financing to retain an experienced project management firm that will manage the Project Management Unit on behalf of OMVG (*ATMO - Assistance Technique à la Maîtrise d'Ouvrage*), financing for internal audits, ESMP implementation costs, and a technical assistance related to the fiber optic cables of OMVG, as well as the further study of how to strengthen or mainstream collaboration between OMVG and OMVS organizations. The fiber optic TA will include (i) a strategic study for the resale of excess capacity available, including a legal and regulatory due diligence, a market study, a business plan and a recommended organizational structure as well as (ii) support in defining the reference offer for the resale of excess capacity and associated reference contracts taking into account of the applicable international, regional and national legal and regulatory frameworks.

23. **Sub-Component 2.2. Operations and Maintenance support to the OMVG Transmission Company (Project Cost US\$20 million, IDA credit US\$20 million).** To ensure a sustainable performance of the transmission facilities, the AMA under OMVG will contract a qualified operator for the O&M of the transmission infrastructure. The O&M contractor will be selected through a competitive process.

24. The AMA will collect revenues from customers that will include national electricity utilities (Senelec, EDG, EAGB and NAWEC), and users of the fiber optic cables. These revenues will be used to pay O&M fees, and to meet OMVG debt obligations to OMVG states. However, each national electricity utility is currently in a weak financial position which presents a risk of non-payment for the O&M operator.

25. To mitigate risk of non-payment and attract a strong qualified operator, the IDA credit contributes to the financing of the O&M contract costs for its first five years of operations.

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<sup>12</sup> The PMU may also be responsible for management of other projects, such as Sambangalou.

Discipline of payments by utilities will be instilled through contracting mechanisms including conditions for suspension of power supply in the event of non-payment.

26. During the first five years of operation, O&M fees will be financed through a combination of IDA and AMA revenues. From its revenues, the AMA will contribute to an O&M dedicated account on a *pari passu* basis with IDA contributions to O&M fees. The O&M dedicated account will accumulate funds to be used to protect against the risk of future non-payment from utilities after the closing date of IDA's operation.

27. O&M fees are estimated to cost approximately US\$13 million per year, or two percent of initial capital costs.<sup>13</sup> IDA will contribute to O&M fees over the first five years of operations on a sliding scale: US\$6 million in the first year, US\$5 million in the second year, US\$4 million in the third year, US\$3 million in the fourth year, and US\$2 million in the fifth year.

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<sup>13</sup> The actual O&M cost will be determined through the competitive bidding process for a qualified O&M operator.

## **ANNEX 3: IMPLEMENTATION ARRANGEMENTS**

### **AFRICA: OMVG Interconnection Project (P146830)**

#### **Project Institutional and Implementation Arrangements**

##### *Institutional and legal aspects for project implementation*

1. The implementation agencies for the project will be the OMVG and the AMA. The OMVG will be responsible for Component 1 – Extension of the WAPP transmission network, and Sub-component 2.1 – Implementation Support. The AMA will be the implementing agency for Sub-component 2.2 – O&M. A monitoring and advisory committee will be established and will be responsible for the overall strategic guidance and oversight of the project.
2. The institutional and implementation arrangements are determined by the legal instruments governing the OMVG, national legislations of member States, and international treaties ratified by all member States. Project activities will be subject to the regulations governing the electricity sector in the various states (including regulations on the production, sale and transmission of electricity) as well as transnational law as provided in OMVG legal instruments.
3. The OMVG legal instruments take into account the sovereignty of member states and define the organization's mode of operation and the conditions for the implementation of OMVG programs and projects. The main instruments are: the Convention on the legal status of the river Gambia; the Convention on the creation of the OMVG (hereafter referred to as the "OMVG Convention"); the Framework agreement on the privileges and immunities of the OMVG; the Convention on the legal status of common works; and the fiscal and customs regulations governing contracts for studies and works on common structures.
4. The OMVG's authority is founded on the devolution of powers by the States as set out in the OMVG Convention. A special convention on the establishment of common structures between the contracting States sets out the conditions for executing and operating all common interest infrastructure such as the Project facilities as well as the reciprocal duties of States in this regard.
5. The draft Special Establishment Convention specifies the general delegation of powers granted to the OMVG by entrusting it with the management of the interconnection line. This delegation of authority will include confirmation of the declaration of the interconnection as a common infrastructure, and all the provisions required for the construction and exploitation of the network.

##### Construction Phase

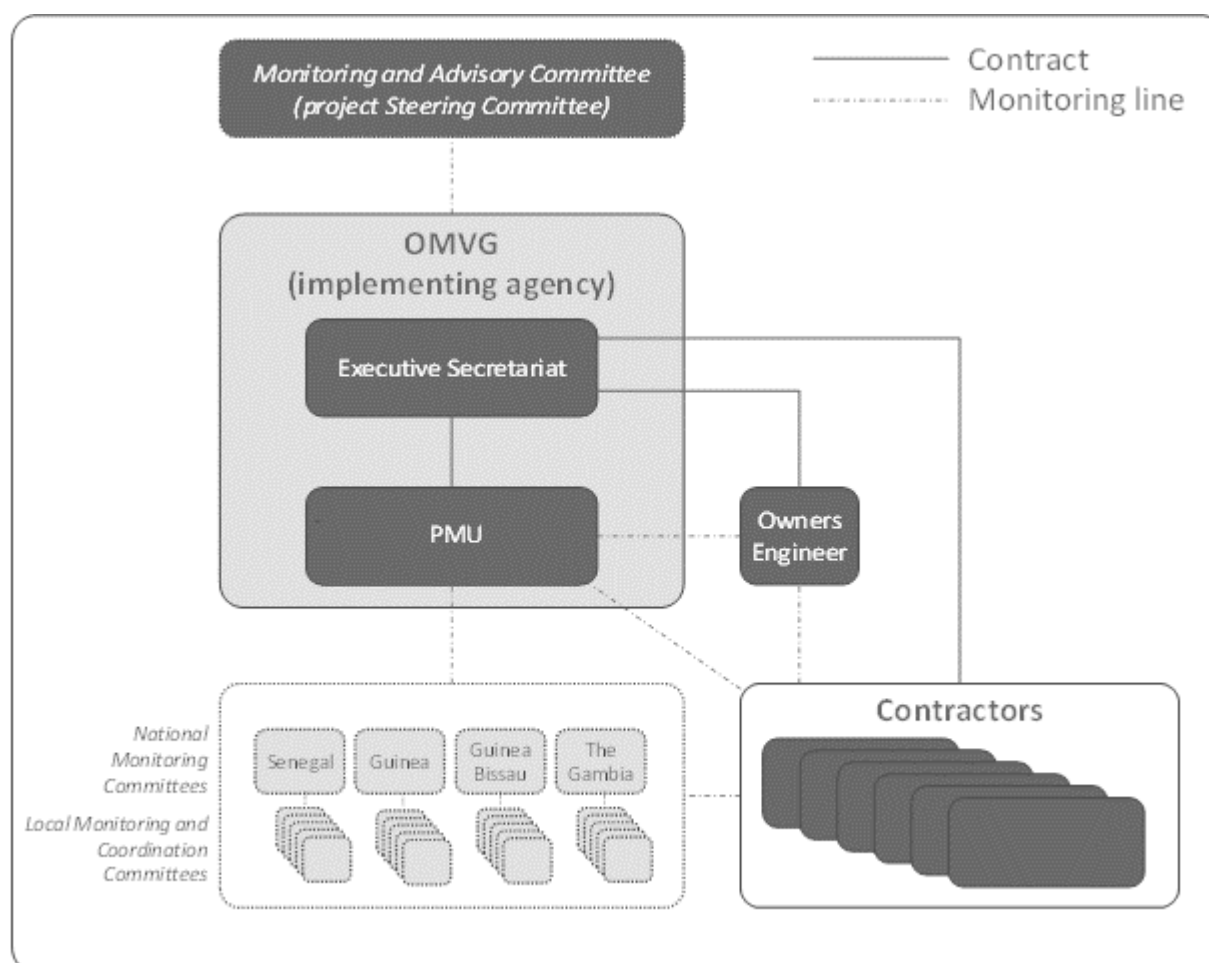
6. The responsibility for the implementation of works has been entrusted to the OMVG in resolution 5/CM/35/B/G adopted by the OMVG Council of Ministers on August 2, 2008 in Banjul. The OMVG will carry out project implementation through a PMU located within the OMVG Executive Secretariat. The PMU will be supported by an owner's engineer on technical aspects

and by national and local monitoring committees for the purposes of facilitating, monitoring and supervising implementation activities on the ground, in particular monitoring the implementation of the ESMP.

7. The institutional and implementation arrangements during the construction phase are outlined in Figure 5. In addition to resolution no 5/CM/35/B/G, in November 2013 in Conakry, the Council of Ministers took a decision authorizing the OMVG Executive Secretariat in collaboration with member States and donors to establish the: (i) monitoring and advisory committee (which will serve as the project Steering Committee), (ii) national monitoring committees, and (iii) local coordination and monitoring committees.

8. Monitoring and Advisory Committee: This Committee will serve as the project steering committee. It will have responsibility for strategic guidance and oversight of the project and will play a central role in the coordination, monitoring and orientation of project activities. It will comprise 19 members representing various project stakeholders as follows: the OMVG Executive Secretariat (Chair), heads of national OMVG units (4), national energy directorates (4), national electricity companies (4), finance ministries (4), WAPP (1), and a representative of NGOs engaged in the environmental and social sectors (1). The secretariat of this committee will be assumed by the Coordinator of the PMU. The Committee will meet whenever necessary but at least semi-annually during the construction phase.

**Figure 5: Institutional arrangements during construction phase**



9. **Project Management Unit:** Given the current limited project management capacity in OMVG, a PMU will be established under the OMVG Executive Secretariat. The PMU will be responsible for: (i) coordination and planning of the works; (ii) supervision and monitoring/control of the project activities; (iii) administrative and financial management; (iv) procurement activities; (v) implementation of safeguards measures; (vi) performing secretariat duties of the monitoring and advisory committee; and (vii) reporting on progress to donors and other relevant stakeholders. Management of the PMU will be delegated to an experienced project management firm, to be selected on a competitive basis financed by the technical assistance component of the project. In addition, the project management firm will be supported by a technical team financed by the AfDB. The structure of the PMU, comprising 36 positions, is shown in Table 8.

**Table 8: Project Management Unit - Structure**

Position	Number
<b>Management (ATMO)</b>	
Coordinator (General Coordinator)	1
Financial Management Specialist (Head of Unit)	1



Electrical Engineer (Head of the Unit)	1
Civil Engineer specialist in Dams	1
Environment Specialist (Head of Unit)	1
<b>Sub Total</b>	<b>5</b>
<b>Support Staff (Financed by the AfDB)</b>	
Electrical Engineer	1
Civil Engineering Engineer	1
Civil Engineer –Site	1
Electromechanical Engineer - Site	1
Electrical Engineers specialists in lines and substations - Site	6
Social Safeguards Specialist	1
Expert ESMP / PR – Site	2
Administration & Logistics	1
Procurement experts	2
Monitoring and Evaluation Expert	1
Expert Communication / Documentation	1
IT / Web Master	1
Project Accountant	1
Assistant accountant of the project	1
Executive Assistant	1
Secretary / Standard	1
Couriers	1
Drivers	5
Saplings	2
<b>Sub Total</b>	<b>31</b>
<b>Total</b>	<b>36</b>

10. National Monitoring Committees: each OMVG Member State will establish a National Monitoring Committee (NMC) that will be responsible for monitoring and supervising activities on the ground, including environmental and social monitoring and administrative, technical and financial facilitation. Each committee shall be chaired by the head of the OMVG national unit and shall comprise representatives of: the ministries in charge of energy, agriculture, local government, finance, and the environment as well as the national electricity company. The NMCs will be supervised and coordinated by the OMVG Executive Secretariat through the Monitoring and Advisory Committee. The PMU will provide progress reports on a regular basis to OMVG secretariat, who will update the Monitoring and Advisory Committee.

11. Local Monitoring and Coordination Committees: under the authority of NMCs, Local Monitoring Coordination Committee (LMCCs) will be created in applicable local government units. The purpose of the LMCCs will be to monitor implementation of field activities including the ESMP and RPF.

12. Contractors: will be responsible for the construction of infrastructure in the specific Lots awarded to them during the competitive bidding process.

13. It is expected that the OMVG will manage all construction contracts including advertising, approving, and signing. Contracts will not be signed by the countries. Utilities will not have a formal role in implementation, beyond signing PPAs and TSAs. In operational phase, the utilities will be the off-takers of energy.

14. National ESIA institutions, national institutions in charge of heritage conservation, contractors, and the owners engineer will have specific roles to play during implementation of the ESMP and RPF. These are detailed in the Environmental and Social section below.

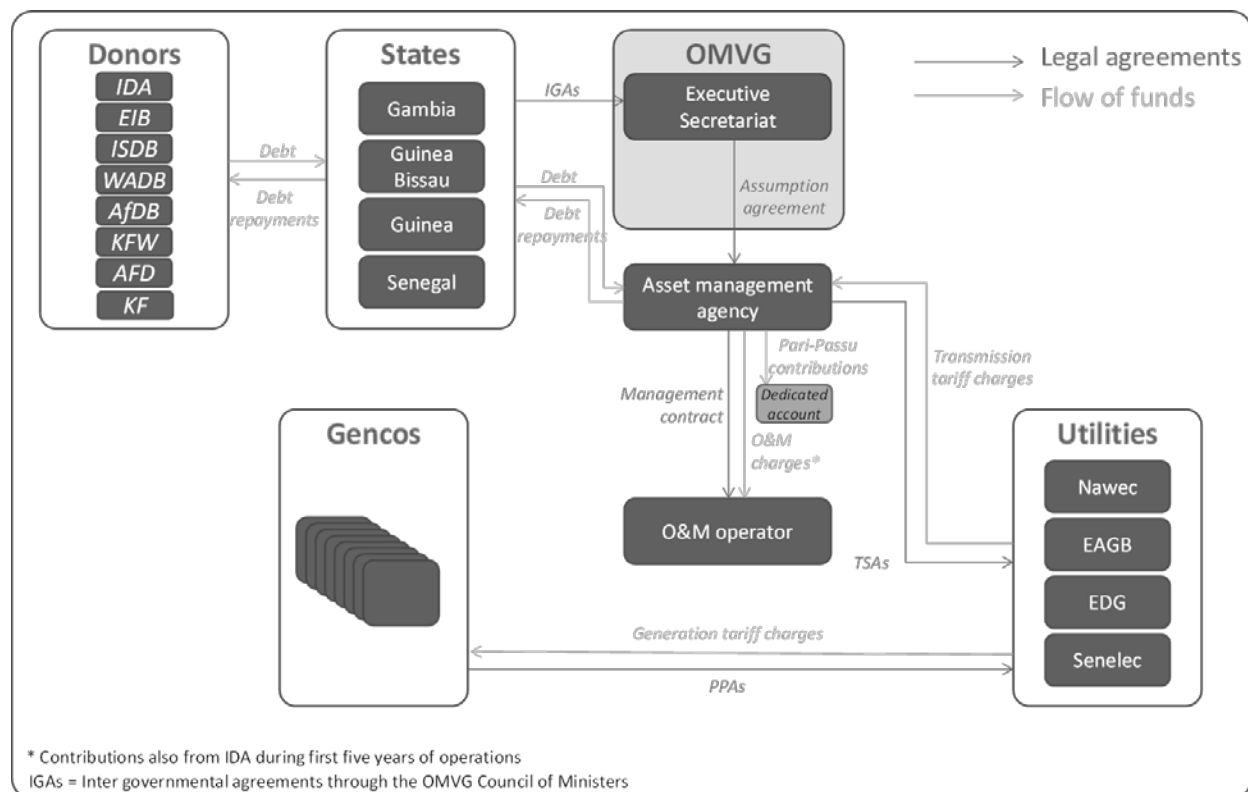
#### Operations Phase

15. The AMA will be the implementing agency for Component 2.2. The AMA will appoint OMVG to perform its project implementation support responsibilities including (i) supervision and monitoring/control of the project activities; (ii) administrative and financial management; (iii) implementation of safeguards measures; and (iv) reporting on progress to donors and other relevant stakeholders. The AMA will be created through a Special Establishment Convention among the OMVG countries. The Special Establishment Convention will need to be ratified within 12 months of project effectiveness (project remedy). The establishment of AMA is a disbursement condition for component 2.2.

16. The capacity of the OMVG is expected to be built through the project. Its will be reassessed during the Project's mid-term review, including assessment of the capacity of OMVG to continue to perform all project implementation support activities on AMA's behalf. Staffing of the OMVG may have to be adjusted following the mid-term review.

17. When the OMVG transmission infrastructure is commissioned and the network transitions from construction to operation, management of the assets and liabilities will transfer from OMVG to the AMA. The AMA will be responsible for managing the operations of the system, billing and collecting revenues from transmission service agreements with each national utility, and to meet debt obligations to OMVG states. The overall contractual arrangements and financial flows during operations are shown in Figure 6.

**Figure 6: OMVG Transmission Network in Operational Phase – Contracts and Financial Flows**



18. The signing of the Transmission Service Agreements (TSAs) between the AMA and each of the utilities using the transmission line are expected to occur during project implementation as new generation assets are developed.

19. AMA will contract a competitively selected qualified operator to ensure adequate operations and maintenance (O&M) of the network.

20. AMA will create an O&M dedicated account and, starting in the second year of operation, deposit part of the revenues from utilities into this O&M dedicated account. The balance of AMA revenues from utilities will be used to cover O&M costs and supplemented by IDA financing on a *pari passu* basis. IDA funds will finance the qualified O&M operator and will not be transferred to the O&M dedicated account.

## Financial Management, Disbursements and Procurement

### Financial Management

21. A Financial Management (FM) assessment of the OMVG was carried out in July 2014. The objective of the assessment was to determine whether OMVG has adequate FM arrangements in place to ensure that the Project funds will be used only for the purposes for which the financing was provided, with due attention to considerations of economy and efficiency.

22. The FM assessment considers, based on the existing FM arrangements, the degree to which: (a) the budgeted expenditures are realistic, prepared with due regard to relevant policies, and executed in an orderly and predictable manner, (b) reasonable records are maintained and financial reports produced and disseminated for decision-making, management, and reporting, (c) adequate funds are available to finance the Project, (d) there are reasonable controls over Project funds, and (e) independent and competent audit arrangements are in place.
23. The assessment complied with the Financial Management Manual for World Bank-Financed Investment Operations that became effective on March 1, 2010 and AFTFM Financial Management Assessment and Risk Rating Principles.
24. The assessment concluded that the project financial management is weakened by: (i) lack of fiduciary function: the FM staff is not yet in place and there is no FM manual, (ii) non-familiarity of the staff of the OMVG with IDA financed-projects and FM procedures, and (iii) lack of internal audit unit.
25. The overall fiduciary risk rating is assessed as Substantial and is expected to be Moderate once the mitigation measures are implemented (refer to Financial Management Action Plan).
26. *Internal Control System:* the “*Règlement Financier*” of OMVG will be used. In addition, an Administrative, Accounting and Financial Procedures chapter will be included in the OMVG Operational Manual to document the financial management arrangements of the Project.
27. An Internal Auditor (individual consultant) will be recruited by the OMVG. The Internal auditor will monitor the administrative, financial, operational and accounting internal control measures and will make recommendations for improvement.
28. *Planning and Budgeting System:* the budget cycle process (task, responsible staff, and deadline) will be clearly described in the Administrative, Accounting and Financial Procedures chapter of the Operations Manual. The budget cycle will follow as much as possible the rules of the “*Règlement Financier*” of OMVG.
29. The existing computerized accounting system (TOMPRO) will be configured to produce activities and budget execution reports, including actual and committed expenditures as well as variances.
30. *Accounting:* the SYSCOHADA accounting standards will be applicable. SYSCOHADA is the assigned accounting system in West African Francophone countries<sup>14</sup>. Project accounts will be maintained on a cash basis, supported with appropriate records and procedures to track commitments and to safeguard assets.
31. The existing accounting software (TOMPRO) will be extended to host the Project.

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<sup>14</sup> The ROSC Accounting and Auditing identified some differences with the International Accounting Standards but they are not expected to impact the project.

32. The Administrative and Financial Department of the PMU will be headed by a Financial Management Specialist and will comprise junior staff.
33. *Financial Reporting:* the OMVG will submit the Interim Financial Report (IFR) to the Bank within 45 days after the end of the calendar quarterly period. The report may include:
- a Sources and Uses of funds Statement, both cumulatively and for the period covered by the report, showing separately funds provided under the Credit;
  - a Uses of funds by components Statement, cumulatively and for the period covered by the report;
  - the designated account reconciliation;
  - the disbursement forecasts of the upcoming six months;
  - explanation of variances between the actual and planned.
34. The OMVG will also produce the projects Annual Financial Statements and these statements will comply with SYSCOHADA and World Bank requirements.
35. These Financial Statements may comprise:
- a Statement of Sources and Uses of Funds which recognizes all cash receipts, cash payments and cash balances,
  - a Statement of Commitments,
  - accounting policies adopted and explanatory notes,
  - a Management Assertion that project funds have been expended for the intended purposes as specified in the relevant financing agreements.
36. The accounting software will be configured to generate directly the quarterly and annual financial statements.
37. *Auditing:* the Financial Statements for the project will be audited annually by an external auditor with qualification and experience satisfactory to the World Bank.
38. The OMVG will agree on the format of the external auditors' terms of reference with all donors.
39. A single opinion on the Audited Project Financial Statements in compliance with International Federation of Accountant (IFAC) will be required. In addition, the external auditors will prepare a Management Letter giving observations and comments, and providing recommendations for improvements in accounting records, systems, controls and compliance with financial covenants in the Financial Agreement.
40. The audited financial statements must be submitted to the Bank within six (6) months after closure of the fiscal year.

### *Financial Management Action Plan:*

		Action	Date due by	Responsible
1	Internal Control	The Administrative, Accounting and Financial Procedures have been designed and agreed (as a chapter of the Operations Manual)	By effectiveness	OMVG
2	Internal Auditor	Hire an internal auditor  Recruit an internal auditor within the OMVG Executive Secretariat	3 months after effectiveness	OMVG

### *Disbursements and fund flow arrangements*

41. Disbursements under this project will be carried out in accordance with the provisions of the Disbursement Guidelines (“*World Bank Disbursement Guidelines for Projects*, dated May 1, 2006”), the Disbursement Letters and the Financing Agreements.

42. *Designated Account:* as 100% of the proceeds of the IDA financing for all four (4) participating countries will be on-lent to the OMVG, the Project will open one (1) pooled Designated Account (DA). The proceeds of the IDA financing accounts (i.e. IDA credits for the four countries) will be disbursed to the pooled DA. The pooled DA will be opened at a commercial bank on terms and conditions acceptable to the Bank. This account will be managed by the OMVG according to the “Règlement Financier” Policy. The OMVG may delegate the management of the DA to the PMU. O&M fees paid by IDA would have to go directly to the operator on account fees due and billed during the life of the project.

43. *Disbursement Methods.* The disbursement methods will be indicated in the Disbursement letter and will consist of the following: the project may use the “Advance” method to request advances to the DA up to its ceiling amount; under the “Direct Payment” method, IDA may make payments to supplier/contractors for eligible goods/services provided to the project; under the “Reimbursement” method, IDA reimburse the Recipient for eligible project expenditures it has pre-financed from its own resources; finally, IDA may pay amounts to a third party for eligible expenditures under special commitments entered into at the Recipient’s request. The minimum value of applications with the exception of applications for advances is equal to twenty (20%) of the DA ceiling.

44. *Designated Account Replenishment and documentation.* At project effectiveness, the OMVG will submit an application for the initial advance to the DA in an amount up to the ceiling. The DA will be replenished through the submission of withdrawal applications on a monthly basis by the OMVG Secretariat and will include all supporting documents such as Statements of Expenditures (SOE) and/or records evidencing eligible expenditures as specified in the Disbursement Letter. All supporting documentation will be retained at OMVG and must be made available for periodic review by Bank’ missions and external auditors.

45. *Disbursement categories and percentages.* As shown in the project cost tables, the project will be co-financed by other lenders in a parallel manner such that each lender finances the entirety of a specific project part (i.e., separate lots have been assigned to each donor in the procurement plan and technical design documents). As a result, IDA will finance 100% of eligible expenditures for the project parts (lots) assigned to IDA. The table of eligible expenditures which sets out the allocation of financing proceeds to disbursement category is shown below.

46. *Authorized signatories.* Applications for withdrawal of proceeds will be signed by authorized signatories designated by the Recipient representative as specified in each Financing Agreement. As 100% of the financing proceeds will be on-lent to OMVG, each member country has designated Project Implementing Entity (initially OMVG and later the AMA) officials as authorized signatories for the purpose of submitting withdrawal applications to IDA through the Financing Agreement (Article II (2.02) and the Authorized Signatory Letter (ref. Annex to the DL).

47. *Counterpart Funds.* States will finance US\$16 million in interest during construction and RPF compensation costs. Interest during construction will be paid directly to respective lending institutions. RPF costs will be paid directly to project affected persons.

**Table 9: Disbursement table by expenditure category (US\$m)**

Category	Amount of the Credit Allocated (expressed in USD million)					Percentage of Expenditures to be Financed
	Total	The Gambia	Guinea	Guinea-Bissau	Senegal	
(1) Goods, works, non-consulting services, and consultants' services for Component 1.1 and Component 1.2 of the Project	\$163	\$42  Part of Lot 6 (Tanaff-Soma) and Lot 7 (Soma-Birkama)	\$20  Part of Lot 5 (Boké-Saltinho)	\$73  Part of Lot 5: Mansoa – Tanaf, Mansoa-Bissau, Bambadinca-Mansoa, Saltinho-Bambadinca and Boké – Saltinho and 1.2	\$28  Part of Lot 5 (Mansoa-Tanaff) and part of Lot 6 (Tanaff-Soma)	100%
(2) Goods, works, non-consulting services, and consultants' services for Component 2.1 of the Project	\$17	\$2	\$3	\$2	\$10	100%
(3) Goods, works, non-consulting services, and consultants' services for Component 2.2 of the Project						100%
(a) for the first disbursement for Part 2.2 of the Project	\$6	\$0.90	\$2.10	\$0.90	\$2.10	
(b) for the second disbursement for Part 2.2 of the Project	\$5	\$0.75	\$1.75	\$0.75	\$1.75	
(c) for the third disbursement for Part 2.2 of the Project	\$4	\$0.60	\$1.40	\$0.60	\$1.40	
(d) for the fourth disbursement for Part 2.2 of the Project	\$3	\$0.45	\$1.05	\$0.45	\$1.05	
(e) for the fifth disbursement for Part 2.2 of the Project	\$2	\$0.30	\$0.70	\$0.30	\$0.70	
<b>TOTAL AMOUNT</b>	200	47	30	78	45	



## ***Procurement***

48. During the construction phase, procurement activities will be managed by the OMVG, through a PMU. Procurement related responsibilities of the PMU will include: (i) managing procurement activities, and ensuring compliance with the procurement process described in the relevant manuals; (ii) preparing and updating annually the procurement plan; (iii) preparing bidding documents, draft Requests For Proposals (RFPs), evaluation reports, and contracts in compliance with World Bank procedures; and (iv) seeking and obtaining approval of IDA (and other donor) on procurement documents as required. The subcomponent managed by AMA (subcomponent 2.2) only requires the procurement of one contract for the recruitment of the O&M operator. The OMVG will carry out the procurement of the O&M contractor. AMA will sign the contract.

49. Procurement of works, goods and consultants' services will be carried out in accordance with (i) the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006, as revised in January 2011; (ii) the "[Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits](#)" published by the World Bank in July 2014; (iii) "[Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers](#)" dated July 2014; (iv) the provisions stipulated in the Financing Agreement; and (v) the Procurement Plan approved by the World Bank.

50. **National Procurement System and Procurement Reforms.** No procurement under national competitive bidding (NCB) is foreseen for this Project. If some goods need to be procured by NCB in the future, World Bank procedures and bidding documents will be used.

## **Procurement methods**

### ***Procurement of works, goods and non-consulting services***

51. *Procurement of works:* The project will finance Design, supply, installation, construction and commissioning of transmission lines; Design, supply, installation, construction and commissioning of substations. For those civil works, International competitive bidding (ICB) will be the procurement method by default. Other methods which may be used when works to be procured meet requirements spelled out in the corresponding paragraph of the procurement Guidelines for such procedures, i.e.: NCB as per paragraphs 3.3 and 3.4; shopping as per paragraph 3.5; and direct contracting as per paragraphs 3.7 and 3.8.

52. *Procurement of Goods:* Goods to be procured under this project would include: vehicles, office equipment, printing documents, IT equipment, software, equipment and other furniture needed for the project implementation. For those goods, International competitive bidding (ICB) will be the procurement method by default. Other methods which may be used when the related goods meet requirements spelled out in the corresponding paragraph of the Procurement Guidelines for such procedures, i.e.: NCB (for example, for goods available locally) as per paragraphs 3.3 and 3.4; shopping as per paragraph 3.5; and direct contracting as per paragraphs 3.7 and 3.8.

53. *Procurement of non-consulting services:* Non-consulting services procured under the project would include general services for the project implementation, services for training and

workshop sessions, insurances, maintenance, etc. These services are not expected to be at high value; therefore, they will be procured using shopping procedures as per paragraph 3.5 of the Procurement Guidelines.

54. Contracts estimated at less than US\$10,000,000 for works and contracts for goods available locally, or non-consulting services with a cost estimate at less than US\$1,000,000, may be awarded through NCB procedures. Contracts for small works (if any), small goods such as office supplies, minor equipment and furniture available locally, or non-consulting services, with a cost estimate equal or below US\$100,000, may be procured under the shopping procedure in accordance with the provisions 3.5 of the Procurement Guidelines.

55. Procurement for works, goods and non-consulting services will be carried using the Bank's Standard Bidding Documents (SBD) for all ICB. In the case of NCB, Senegal, where The OMVG Executive Secretariat is located, has developed National SBD; however, these ones may not be up to date in particular with regard to provisions related to fraud and corruption. As such, it has been agreed that for this project, the Bank's SBD be adapted (or modified to meet the exceptions authorized under NCB) and used for NCB. In the case of shopping, the procurement will be done in accordance with the Memorandum "Guidance on Shopping" issued by the Bank, date June 9, 2000 (provided this memorandum is not contradictory with the Procurement Guidelines) and the "Guide for the procurement of small contracts" issued on February 1, 2011.

### ***Selection of Consultants***

56. Consultant services to be procured would include: studies and supervision missions, development of manuals of procedures, technical assistance, financial audit, and training. Consultants will be selected using the Quality and Cost-Based Selection (QCBS) method in most cases. In other cases specified in the Procurement Plan (PP) the following methods will be used: (1) Least Cost Selection (LCS); (2) Selection Based on the Consultants' Qualifications (CQS); (3) Single Source Selection (SSS) and (4) Individual Consultants (IC) Selection (either through competitive selection or single source).

57. For competitive selection methods, the selection will be done necessarily (i) through requests for expressions of interest (REIs) except for the Selection Based on the Consultants' Qualifications and the selection of individual consultants for which REIs are not mandatory, and (ii) using the Bank's Standard Request for Proposals where required. For simplified selection methods such as the Selection Based on the Consultants' Qualifications and the Selection of Individual Consultants, the "Guide for the procurement of small contracts" issued on February 1, 2011 may be used (in the present case for the use of CQS or Individual Consultants Selection).

58. Short lists of consulting services with a cost estimated to be less than \$300,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

### ***Operating Costs***

59. The Credits would finance the operating costs related to the implementation of the project as defined in the Financing Agreements. They would be covered whenever possible using shopping procedures or using the Project Operational Manual acceptable to the Bank.

## **Assessment of the agency's capacity to implement procurement**

60. An assessment of OMVG's capacity to implement procurement activities was conducted in July 2014. The assessment reviewed the organizational structure for implementing the Project and the interaction between the staff responsible for procurement for the Project and the Implementing Agency (IA) relevant central unit for administration and finance.

61. The assessment carried out during Project preparation showed that the main issues/risks concerning the procurement activities for the Project's implementation are: (i) the multiple donors and, related to that, the multiple procedures to be used with joint or parallel financing; in addition, OMVG has no experience with The World Bank's procedures and needs to have more capacity in procurement, (ii) the administrative and financial procedures manual doesn't take into account The World Bank's procedures; and (iii) there is no procurement specialist with sufficient experience in The World Bank's procedures.

62. The overall procurement risk is *substantial*. The residual risk for procurement is *moderate* after adoption of the following mitigation measures:

- (a) develop procurement capacity in OMVG including through support from senior staff of the ATMO;
- (b) prepare a procurement procedures chapter in the OMVG Operations Manual;
- (c) train the staff and technical experts involved in the Project implementation, in World Bank procurement procedures. This approach will be to provide appropriate procurement training, including contract management, to technical specialists and experts who will handle procurement activities.

## **Procurement Plan**

63. The Borrower has developed a preliminary Procurement Plan for project implementation during an initial period of 18 months, which provides the basis for the procurement methods. The procurement plan will remain dynamic and updated to reflect more details in the implementation of the project when decision will be taken on these details.

### **Procurement Plan (World Bank financed works only)**

#### **Details of the Procurement Arrangements Involving International Competition**

#### **1. Goods, Works, and Non Consulting Services**

- (i) List of contract packages to be procured:

##### ***Prior review thresholds:***

	<b>Method</b>	<b>Levels</b>	<b>Comments</b>
<b>1.</b>	<b>Goods</b>	$\geq$ US\$1,000,000	Prior review
<b>3.</b>	<b>Works</b>	$\geq$ US\$10,000,000	Prior review
<b>5.</b>	<b>Direct Contracting</b>	All contracts	Prior review

1	2	3	4	5	6	7	8	9
Ref. No.	Contract (Description)	Estimated Cost (USD Million)	Procurement Method	P-Q	Domestic Preference (yes/no)	Review by Bank (Prior / Post)	Expected Bid-Opening Date	Comments
	<b>HV/MV Substations</b>							
ICB/ Nr P3	Guinea-Bissau Substations: Bambadinca & Salthino	22.61	ICB	Yes	No	Prior	06/24/2015	

	<b>Lines 225 kV</b>							
ICB/ Nr L5	Line “Boké – Salthino – Bambadinca – Mansoa – Tanaff & Mansoa - Bissau”	73.66	ICB	Yes	No	Prior	06/24/2015	
ICB/ Nr L6	Line “Tanaff – Soma”	26.20	ICB	Yes	No	Prior	06/24/2015	
ICB/ Nr L7	Line “Soma - Brikama”	40.64	ICB	Yes	No	Prior	06/24/2015	

- (ii) ICB contracts estimated to cost above US\$ 10,000,000 per contract for civil works and US\$ 1,000,000 for goods and non-consultancy services, the first contract irrespective of the cost estimate and all direct contracting will be subject to prior review by the Bank.

## 2. Consulting Services

### *Prior review thresholds:*

	Selection method	Prior review level	Comments
1.	Selection of firms	>= US\$300,000	Prior review
2.	Selection of individual consultants	>= US\$100,000	Prior review
3.	Single source for firms and individual consultants	All contracts	Prior review

1	2	3	4	5	6	7
Ref. No.	Description of Assignment	Estimated Cost (USD Million)	Selection Method	Review by Bank (Prior / Post)	Expected Proposals Submission Date	Comments
01/CS	ATMO <sup>15</sup>	12.40	QCBS	Prior	03/06/2015	
02/CS	Internal auditor (from IC)	0.25	IC	Prior	06/05/2015	
03/CS	TA for Fiber Optics	0.5	QCBS	Prior	12/12/2015	
04/CS	O&M Operator <sup>16</sup>	20.00	QCBS	Prior	10/26/2016	

- (iii) Consultancy services estimated to cost above US\$300,000 per contract for firms and US\$100,000 per contract for individual consultants, the first contract irrespective of the cost estimate and every single source selection of consultants (firms) for assignments will be subject to prior review by the Bank.
- (iv) Short lists composed entirely of national consultants: Short lists of consultants for services estimated to cost less than US\$300,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

### ***Environmental and Social (including safeguards)***

64. The project is rated as an EA category B. The policies triggered are as follows:

Safeguard Policies Triggered by the Project	Yes	No
<a href="#">Environmental Assessment (OP/BP 4.01)</a>	[ x ]	[ ]
Natural Habitats ( <a href="#">OP/BP 4.04</a> )	[ x ]	[ ]
Pest Management ( <a href="#">OP 4.09</a> )	[ ]	[ x ]
Indigenous Peoples ( <a href="#">OP/BP 4.10</a> )	[ ]	[ x ]
Physical Cultural Resources ( <a href="#">OP/BP 4.11</a> )	[ x ]	[ ]
Involuntary Resettlement ( <a href="#">OP/BP 4.12</a> )	[ x ]	[ ]
Forests ( <a href="#">OP/BP 4.36</a> )	[ x ]	[ ]
Safety of Dams ( <a href="#">OP/BP 4.37</a> )	[ ]	[ x ]
Projects on International Waterways ( <a href="#">OP/BP 7.50</a> )	[ ]	[ x ]
Projects in Disputed Areas ( <a href="#">OP/BP 7.60</a> )*	[ ]	[ x ]

65. OMVG has prepared an Environmental and Social Impact Assessment (ESIA), an Environmental and Social Management Plan (ESMP), and a Resettlement Policy Framework (RPF). The ESIA and ESMP were published at the Bank's Infoshop (11<sup>th</sup> November 2014), on OMVG's website (28<sup>th</sup> October 2014), and in Guinea-Bissau (27<sup>th</sup> November 2014), The Gambia (10<sup>th</sup> December 2014), Guinea (8<sup>th</sup> December, 2014), and Senegal (6<sup>th</sup> February 2015). The RPF

<sup>15</sup> ATMO procurement is being led by the OMVG Executive Secretariat

<sup>16</sup> This contract will be signed by the AMA

\* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.

was published in the World Bank InfoShop (11<sup>th</sup> December 2014), on the OMVG website (12<sup>th</sup> December 2014), and was disclosed in all countries by February 11, 2015. These documents include relevant mitigation measures and their comprehensive implementation mechanisms.

66. ***Risks and impacts management:*** OMVG will ensure: (i) the implementation of an appropriate communication plan throughout the construction phase to keep the surrounding populations permanently informed on any relevant issue, including the sensitization on HIV and Sexual Communicable Diseases (SCD); (ii) that the enterprises comply with environmental, health and safety (EHS) standards on the works sites, national labor regulations, and have set up mechanism to recover chance find archeological artifacts; and (iii) that the quarries and borrow pits are appropriately rehabilitated at the end of works.

67. ***Implementation of the safeguard measures and recommendations:*** the main responsibilities are distributed as follows:

- *The PMU Environmental and Social Department:* hosted by the Project Management Unit, the department will be responsible for the appropriate execution of the ESMP. States will be responsible for the implementation of the RPF (in coordination with OMVG). The PMU will ensure regular reporting as well as mid-term and final audits of the environment and social measures and recommendations. These reports are shared with the Ministries in charge of environment in compliance to national rules, with Donor and any other relevant stakeholder.
- *National ESIA institutions:* They have the regulatory mandate to ensure that the project developer (OMVG) has complied with the safeguard requirements throughout the project lifecycle, by approving the reports and further oversight of the implementation of the mitigation measures. In collaboration with the local monitoring committees, they may carry out joint supervisions of the enterprises on the ground during the civil works. They will be receiving all the final safeguards implementation supervision and audit reports. They are: the ‘*Direction de l’Environnement et des Etablissements Classés*’ (DEEC) in Senegal, the National Environmental Agency (NEA) in The Gambia, the ‘*Bureau Guinéen des Etudes et Evaluations Environnementales*’ (BGEE), and the ‘*Célula de Avaliação de Impacte Ambiental*’ in Guinea-Bissau.
- *The Contractors:* they will have the responsibility of executing a large part of the environmental and social measures of the construction phase, which has been integrated in the bidding documents. To this end, they will prepare their own ESMP (the Contractor Environmental and Social Management Plan – CESMP), excerpted from the global ESMPs approved through the ESIA reports. The draft CESMPs will be cleared by the Environmental and Social Management Department (DSE) of the project implementing unit in collaboration with the National ESIA institutions prior to the commencement of the civil works, and the approved version integrated in their detailed work plan. To carry out a proper implementation of its obligations related to compliance with environmental and social aspects, any contractor working for the project will recruit environmental and social safeguard specialists who will work closely with the principal engineer of the team. Also, an EHS committee will be set up on each works site. The enterprises will issue periodic

implementation reports that comprise a dedicated section on the execution of the CESMP; these reports will be shared with donors and national stakeholders.

- *The Owners Engineer:* the Owner's Engineer will have, in addition to the technical control tasks, to ensure the day-to-day oversight on the compliance to CESMP by the contractor. Therefore, the recruitment of an environmental safeguard specialist within the team is also required here to help handling the job in the adequate way. A separate CESMP survey report will be periodically produced to the Executive Secretariat of OMVG.
- *The National Institutions in charge of Heritage conservation:* They will assist the DSE and the enterprises in the execution of the "Chance Find Procedure", at any time an underground physical cultural wealth is uncovered. If such matter occurs, and appropriate actions were completed, the institution will issue a completion report to the OMVG Executive Secretariat for archive.

### ***Follow up and reporting on the implementation of the mitigation measures***

68. The environmental and social mitigations measures will be executed, monitored and reported in the Environmental and Social Safeguards section of the overall project periodic report. Apart from the PMU national ESIA institutions that are responsible according to regulations, the following stakeholders can play roles in the follow up of the execution of the safeguard due diligences:

- *Environmental and Social Management Steering Committee:* chaired by the Executive Secretariat of OMVG and under the framework of the Monitoring and Advisory Committee, will have the mandate of approving the annual work plan and budget on the environmental management side.
- *Conservation Independent Expert Panel (CIEP):* composed of representatives of NGOs as envisioned by the OMVG Secretariat, the panel will assist in forming recommendations if any loss of natural habitat occurs after the delineation of the Right-of-way of the transmission lines.
- *Local Committees of Dialogue and Follow up:* composed of relevant public institutions, NGOs and representatives of affected people, the committees will be set up at national or subnational level, as appropriate.

## **ANNEX 4: IMPLEMENTATION SUPPORT PLAN**

### **AFRICA: OMVG Interconnection Project (P146830)**

#### **Strategy and Approach for Implementation Support**

1. The Implementation support plan ensures that the Bank mobilizes the required resources to supervise the project and provide the OMVG, the Implementing Agency, with the necessary support to implement the various components of the project on schedule, as well as the risk mitigation measures identified.
2. The project will require simultaneous implementation of activities in four different countries. The project will require substantial resources for considering its four-country involvement.
3. The plan is based on three major principles: (i) consistent review of fiduciary procedures and controls within the OMVG; (ii) frequent field-based supervision of project activities; and (iii) sustained high-level policy dialogue with the four governments on improving support for the project.

#### **Implementation Support Plan**

4. The Bank team would consist of staff located in Headquarters in Washington, DC, and in various Country Offices. Formal supervision and implementation support missions will be carried out at least semi-annually or as often as rendered necessary by implementation needs. The following aspects will be addressed during supervision:
  - a. *Technical:* Power engineering expertise will be needed to review the procurement documents and contracts. During construction and until commission, technical supervision will be required to ensure contractual obligations are met on technical grounds.
  - b. *Fiduciary:* The team will help the implementing agency identify capacity-building needs in financial management and procurement management. For each of the financial management and procurement areas, a Bank senior specialist based in Dakar will cover those requirements. In addition to the prior review of documents to be carried out from Bank offices, the capacity assessment of the Implementing Agency has recommended two supervision missions a year; during one of those missions, a post review of procurement will be carried out.
  - c. *Safeguards:* Field based environmental and social specialists will provide guidance and inputs to the implementing agencies and monitor the progress of implementation of the EMPs and RAP.
  - d. *Power trade:* Regulatory and power trade expertise will be required to monitor the implementation of the power trade arrangements before commissioning and during the initial phase of operation. The team will provide experts to support the implementing agency during this phase.



5. The budget for this Implementation Support Plan is estimated at US\$280,000 per annum for the first three years and US\$115,000 for the years after that. Table 10 and Table 11 list the skills required and an estimate of resources.

**Table 10: Supervision Needs**

Time	Focus	Skills Need	Partner Role
Phase I: (approx. six months)	Effectiveness, Contracting, FM and safeguards.	Legal, engineering, procurement, financial management, regulatory, environmental and social/resettlement, country economist.	Joint supervision with financing partners: AFD, AfDB, WADB, EIB, ISDB, KF and KfW
Phase II: (approx. 24 months)	Construction	Engineering, financial management, environmental and social/resettlement	Joint supervision with financing partners: AFD, AfDB, WADB, EIB, ISDB, KF and KfW
Phase III: (approx. 60 months)	Operation	Engineering, commercial, financial management, environmental and social/resettlement	Joint supervision with financing partners: AFD, AfDB, WADB, EIB, ISDB, KF and KfW

**Table 11: Estimated Staff Required during Supervision**

Skills	Staff-weeks (per FY)	Trips (per FY)
Team Leader	10	2
Power Engineer	6	2
Financial Analyst	6	2
Procurement Specialist	6	2
Regulatory/Power trade Specialist	2	1
Technical Experts	4	2
FM Specialist	4	
Environment specialist	6	4
Social Specialist	6	2
Administrative Support	10	

### **Joint co-financiers implementation support**

6. In order to create synergies and reduce the administrative burden to the Recipients, the co-financiers plan to conduct joint supervision missions.

7. In order to minimize the burden of supervision on the client, the co-financiers have agreed in principle that joint supervision missions would be conducted at least twice every year, or as otherwise agreed and that the responsibility of supervision would be shared among the co-financiers.

## ANNEX 5: ECONOMIC AND FINANCIAL ANALYSIS

### AFRICA: OMVG Interconnection Project (P146830)

1. This annex provides an economic and financial analysis of the proposed OMVG transmission interconnection between Senegal, Guinea, Guinea-Bissau, and The Gambia.

#### *Economic Analysis*

2. The objective of the economic analysis is to estimate the net economic benefits of the OMVG interconnection by estimating the fuel and investment savings that would be achieved when the transmission line is built relative to “business as usual” without the interconnection, where countries fulfill demand domestically rather than through imports.

3. The main benefit of the proposed interconnection would be to enable electricity trade between the participating countries, and within the wider regional network. The OMVG transmission line will allow for the transfer of surplus generation from the country/region with the least/lower future generation costs to the system with the higher/highest generation costs.

#### **Methodology**

4. The analysis evaluates the benefits of the interconnection by comparing three scenarios, which are based three key parameters that determine the economic viability of the project, namely underlying demand, availability of surplus energy to trade, and dependence on imports. Key assumptions are summarized in Table 12 and described in more detail below.

**Table 12: Key assumptions used in scenarios**

	<b>Pessimistic</b>	<b>Base Case</b>	<b>Optimistic</b>
Demand Growth	1.5 percent points below base case annually (approximately 34 percent decrease over base case in 2037)	5-7 percent growth per year (see details below)	2 percent points above base case annually (approximately 34 percent increase over base case in 2037)
Availability of surplus energy	4 year delay in expected commissioning of pipeline hydro projects	2 year delay in expected commissioning of pipeline hydro projects	Hydro projects developed on track
Dependence on imports	At least 35 percent self-generation	At least 30 percent self-generation	At least 25 percent self-generation

5. In each scenario, total costs in the “business as usual” case is compared to the “with interconnection” case. NPV and EIRR are estimated based on the avoided costs (Capex and Opex).

#### *Assumptions*

6. A model is used for simulations, using the following assumptions for each scenario:

7. **Time horizon:** a study period of 2015-2037 is used.

8. **Discount rate:** a benchmark of 10 percent is used.

9. **Transmission losses:** 3%

10. **Euro / US\$ exchange rate:** \$1.25 / €(December 2014, when financing plan between donors was agreed)

11. **Country demand forecast:** the demand forecast of the four countries are based on official forecasts obtained from electric utilities, the WAPP Master Plan, and by independent consultants. They estimate the served and unserved based demand based on historical load data. The tables below present the demand forecast assumptions and demand forecasts for the four countries.

**Table 13: Details on base case demand forecast assumptions**

<b>Demand forecast assumptions</b>	
<b>The Gambia</b>	Demand forecasts are based on the WAPP Master Plan, and consider unserved demand and the connection of isolated centers. Demand increases at 3-4 percent per year, from 586 GWH in 2015 to 1,296 GWH in 2037.
<b>Guinea</b>	Demand forecasts from the WAPP Master Plan forecasts are considered, which are consistent with EDG expectations. The forecast includes unserved demand, growth in demand from mining sector and the connection of isolated centers. Demand increases at 3-10 percent per year, from 1,563 GWH in 2015 to 6,488 GWH in 2037.
<b>Guinea-Bissau</b>	Demand analysis based on data from the most recent Plan for Infrastructure Development for the production and distribution of electricity (CABIRA version June 2013). Forecasts based on “realistic” scenario developed in CABIRA study, with a 7 percent growth rate in electricity demand, from 202 GWH in 2015 to 864 GWH in 2037.
<b>Senegal</b>	Senelec’s proposed 2015-16 growth rate of 6 percent is extended over the project period. This is based on population growth, increased urbanization, and expansion of the network to reach 56 percent of population currently unserved. Demand increased from 3,441 GWH in 2015 to 12,373 GWH in 2037.

**Table 14: Base case demand forecasts (GWH)**

	2015	2016	2017	2018	2019	2027	2032	2037
<b>Guinea</b>	1,563	1,782	1,962	2,159	2,374	4,601	5,596	6,488
<b>Guinea Bissau</b>	202	216	231	246	263	446	620	864
<b>Gambia</b>	586	609	629	649	670	893	1,075	1,296
<b>Senegal</b>	3,441	3,640	3,827	4,089	4,335	6,909	9,246	12,373
<b>Total</b>	<b>5,792</b>	<b>6,247</b>	<b>6,649</b>	<b>7,143</b>	<b>7,642</b>	<b>12,849</b>	<b>16,537</b>	<b>21,021</b>

## Country supply forecasts

12. **Supply-demand gap:** in the absence of current Master Plans, supply forecasts in the short run (2015-2020) are based on estimates for projects already under preparation. This means that supply gaps in The Gambia and Guinea-Bissau persist in the short run. The model assumes that supply gaps are reduced 2020-2025, and from 2025-2037, supply is sufficient to meet demand.

13. **Capacity reserves:** assume a long term goal rate minimum capacity reserve available in the range of 25 percent post 2025, which guarantees a maximum allowable level of failure. The analysis assumes a gradual evolution of the reserve power available during a transitional period, given the importance of the current deficit to be filled. It should be noted that these criteria are objective and can be achieved in most countries after a period of transition and upgrade of the electrical system.

**Table 15: Generation projects in the sub-region (under preparation or implementation)**

Name	Country	Capacity	Status	Expected	Scenarios	
					BAU	With interconnection
OMVG 1 <sup>st</sup> Phase (Regional projects)						
<b>Kaleta</b>	Guinea	240 MW	Under construction	2015	Yes	Yes
<b>Sambangalou</b>	Senegal / Guinea (turbines will be in Senegal)	130 MW	Construction contract signed with China Gezhouba Group Corporation Limited (CGGC Ltd). Financing under negotiation with China Exim Bank	2020	No	Yes
OMVG 2 <sup>nd</sup> Phase (Regional projects)						
<b>Digan</b>	Guinea	93 MW	Feasibility studies to be done	2022-25	No	Yes
<b>Fello Sounga</b>	Guinea	82 MW	Feasibility studies to be done	2022-25	No	Yes
OMVS 2 <sup>nd</sup> Phase (Regional projects)						
<b>Saltinho</b>	Guinea-Bissau	20 MW	Feasibility studies to be done	2022-25	No	Yes
<b>Gouina</b>	Mali	140 MW	Under construction	2019	No	Yes
OMVS 3rd Phase (Regional projects)						
<b>Koukoutamba</b>	Guinea	294 MW	Feasibility studies completed.	2021	No	Yes
<b>Boureya</b>	Guinea	160 MW	Pre-feasibility studies completed.	2022	No	Yes
<b>Balassa</b>	Guinea	181MW	Concept	2024	No	Yes
Banda Gas to Power (Regional project)						
<b>Banda</b>	Mauritania	300 MW	Under construction	2018	Yes	Yes
Senegal (National projects)						
<b>Tobene IPP</b>	Senegal	70MW	Under construction	2015	Yes	Yes
<b>Sendou 1</b>	Senegal	115 MW	Under construction	2017	Yes	Yes
<b>Sendou 2</b>	Senegal	115 MW	Under construction	2022	Yes	Yes
Guinea National						
<b>Souapiti</b>	Guinea	600 MW	Feasibility studies to be updated	2023	Yes	Yes
<b>KassaB</b>	Guinea	135 MW	Feasibility studies to be done	2027	Yes	Yes

<b>Amaria</b>	Guinea	300 MW	Feasibility studies to be done	2034	Yes	Yes*
<b>Grand Kinkon</b>	Guinea	291 MW	Feasibility studies to be done	2030	No	Yes
<b>Binkon Diaria</b>	Guinea	174 MW	Feasibility studies to be done	2029	No	Yes
<b>Fetore</b>	Guinea	124 MW	Feasibility studies to be done	2029	No	Yes
<b>Kouya</b>	Guinea	86 MW	Feasibility studies to be done	2033	No	Yes
<b>Poudalde</b>	Guinea	90 MW	Feasibility studies to be done	2025	No	Yes*
<b>Tiopi</b>	Guinea	120 MW	Feasibility studies to be done	2026	No	Yes*
<b>Morisakano</b>	Guinea	100 MW	Feasibility studies to be done	2035	No	Yes*
<b>Diaraguela</b>	Guinea	72 MW	Feasibility studies to be done	2034	No	Yes*
<b>Fomi</b>	Guinea	90 MW	Feasibility studies to be done	2032	No	Yes*
<b>Kouravel</b>	Guinea	135 MW	Feasibility studies to be done	2031	No	Yes*
<b>Sources: National planning documents, OMVG, WAPP master plan (2011); World Bank assumptions on certain Hydro Projects</b>						
<b>* Not included in pessimistic scenarios</b>						

14. **Supply in “Business as usual”:** The model assumes supply is met through existing alternatives:

- **Hydro projects:** Guinea develops hydro projects sufficient to meet local demand (including Kaleta, Souapiti, Amara and Kassa B), and which do not depend on the OMVG interconnection. The model assumes OMVG and OMVS pipeline hydro projects are not developed without the OMVG interconnection.
- **National thermal projects**
  - **Senegal:** supply is met through pipeline projects already under implementation (e.g., Banda gas to power, Tobene, Sendou). Additional capacity is met through 90 MW HFO plants (with same characteristics as Tobene).
  - **Guinea:** supply is met through limited hydro development including projects already under construction (e.g., Kaleta), or national projects under preparation likely to be implemented without OMVG (e.g., Souapiti). Any additional capacity needed is met through 16 MW HFO plants with same characteristics as existing plants.
  - **The Gambia and Guinea-Bissau:** supply is met through the development of 10 MW HFO plants.

15. **Supply with interconnection:** With the interconnection, new supply is developed on the basis of meeting regional demand:

- **Hydro:** all OMVG and OMVS pipeline hydro projects are commissioned on a feasible timeline. Figure 2 and Table 15 provide an overview of regional projects currently

under implementation or preparation.<sup>17</sup> Additional hydro projects are also developed in Guinea. Timelines used are considered feasible, though the scenarios used take a conservative approach and build in unforeseen delays.

**National thermal projects:** planning for new thermal capacity is added on a sub-regional basis. Senegal develops surplus capacity for export based on 90 MW HFO plants with the same characteristics as Tobene.

16. **Dependence on imports:** the model assumes a minimum self-generation of 30 percent of total supply.<sup>18</sup> This is intended to capture an important political economy dimension of power trade. While there may be strong economic incentives to access lower costs imports, it is unlikely any country will become fully dependent on imports. These assumptions on how supply is met result in the investments profiles summarized on Table 15 and Table 16.

**Table 16: Capacity investments in each scenario, by generation type, 2015-37**

	The Gambia HFO	Guinea- Bissau HFO	Guinea Hydro	HFO	HFO	Senegal Banda (42% of 300)	Coal	Regional Hydro (see table)	Total
Unit size (MW)	10	10	(Varies)	16	90		115		
<b>BASE</b> <u>Business as usual</u>									
# Units	17	15	4	46	20	1	2	0	<b>106</b>
Total new installed MW	174	154	1275	730	1806	126	230	0	<b>4,495</b>
			(w 2 year delay)					(w 2 year delay)	
<u>With interconnection</u>									
# Units	1	4	14	2	17	1	2	8	<b>49</b>
Total new installed MW	10	40	2557	32	1530	126	230	689	<b>5,214</b>
			(w 2 year delay)					(w 2 year delay)	
<b>OPTIMISTIC</b> <u>Business as usual</u>									
# Units	26	21	4	66	29	1	2	0	<b>149</b>
Total new installed MW	260	207	1275	1056	2604	126	230	0	<b>5,757</b>
<u>With interconnection</u>									
# Units	1	4	14	2	32	1	2	8	<b>64</b>
Total new installed MW	10	40	2557	32	2880	126	230	689	<b>6,564</b>
<b>PESSIMISTIC</b> <u>Business as usual</u>									
# Units	10	11	3	38	12	1	2	0	<b>76</b>
Total new installed MW	97	105	975	608	1051	126	230	0	<b>3,193</b>
			(w 5 year delay)					(w 5 year delay)	
<u>With interconnection</u>									
# Units	1	4	7	12	8	1	2	8	<b>43</b>
Total new installed MW	10	40	1650	192	720	126	230	689	<b>3,657</b>
			(w 5 year delay)					(w 5 year delay)	

Note lower capacity factors on hydro compared with thermal means a higher installed MW is needed with hydro than with thermal to meet the same underlying demand.

<sup>17</sup> Note there is interdependency between the OMVG and OMVS networks. All the post 2020 OMVS projects are expected to use the OMVG interconnection to transmit electricity, meaning development of OMVS generation pipeline projects is dependent on development of the OMVG interconnection to evacuate power to Senegal and Guinea (existing OMVS line has limited spare capacity). Meanwhile the added traffic from the OMVS projects will help lower the cost of electricity supplied along the OMVG network.

<sup>18</sup> Source: MoUs signed for OMVG and additional exports using OMVG represent 70 percent of base case demand in Guinea-Bissau and 60 percent of base case demand in The Gambia in 2020. MoUs have been signed between Senelec and Nawec, 60 MW / 300 GWh; and Senelec and EAGB, 20 MW / 100 GWh.

17. **Fuel Costs:** The price of crude oil is estimated at US\$80 per barrel derived from several industry forecasts. A transport cost of \$40 per ton was assumed for coal, and a 55 percent cost increase on HFO and Diesel delivered to The Gambia and Guinea-Bissau (source: Sofreco).

### Economic Costs

18. Each scenario is evaluated on total discounted cost corresponding to the discounted sum of investment costs (annuities) of new equipment, fixed operating expenses, fuel loads and variable expenses from all generation sources.

19. The business as usual case has an investment cost of US\$2.3bn, and a total discounted cost of US\$11.35bn. With the interconnection, investment costs increase to US\$2.9bn, but lower opex resulting from unlocking regional hydro resources leads to a total discounted cost of US\$10.5bn (See Table 17) In the optimistic growth scenario, total costs increase to \$11.4bn in the case with interconnection, reflecting higher capex and opex to meet demand. In the low growth scenario, total costs reduce to \$9.4bn in the case with interconnection.

**Table 17: Economic costs**

Scenario Name	Opex	Investment Costs	Total Cost
	USD\$m	USD\$m	USD\$m
<b>Base Case</b>			
<b>Business as usual</b>	\$9,047	\$2,306	\$11,353
<b>With OMVG interconnection</b>	\$7,545	\$2,923	\$10,468
<b>Optimistic</b>			
<b>Business as usual</b>	\$10,440	\$2,462	\$12,902
<b>With OMVG interconnection</b>	\$8,465	\$2,923	\$11,388
<b>Pessimistic</b>			
<b>Business as usual</b>	\$7,556	\$2,159	\$9,715
<b>With OMVG interconnection</b>	\$6,537	\$2,923	\$9,460

### Economic Benefits

20. Two benefits are considered in the economic analysis:

- **Improved optimization of the generation investments:**
  - reduction in expenditures using the complementarity of load curves that form total demand, thereby enabling larger and more economical generation plants
- **Improved use of the generation capacity:**
  - reduction in operating costs through more economical dispatch of generating units performed at a larger scale
  - opportunity to buy power at a lower cost than domestic generation

- optimization of integrated power network through seasonal trade as demand peaks at different times of the year across the four countries due to climate differences.
- **GHG emissions reduction**

21. The economic analysis is conservative and likely under-estimates the full benefits. Additional benefits of the OMVG interconnection not considered in the analysis include:

- Additional country exchanges that could take place based on seasonality and peak transfers, particularly between Senegal and Guinea
- Reductions in necessary capacity and spinning reserves
- Increased access to electricity via expansion of the distribution grid from the interconnection sub-stations
- Revenues from the sale of fiber optic capacity
- Deeper political and economic integration, promoting increase regional stability
- Improved financial viability of the national power utilities through lower cost of power
- Improved macroeconomic balance through a reduction in fuel imports
- Boosting telecommunications infrastructure, further improving the environment for doing business
- Job creation during construction and operations, including skilled jobs (engineers, senior technicians, etc.)

## Results of Economic Analysis

22. By aggregating demand and developing regional projects, the integrated network helps to reduce the total expenditures needed to meet demand. Based on the difference in net present value (NPV) of both investment and operating costs for the four countries' electricity networks, the interconnection project has a positive NPV of US\$885 million (with a 10 percent discount rate) and an economic rate of return (EIRR) of 17 percent for the four countries under the base case scenario. The results confirm that even with low growth and significant delays to the development of hydro projects in the region, the project remains economically viable. In the pessimistic scenario, the NPV of avoided costs is reduced to US\$255m, with an EIRR of 12.26 percent. In the optimistic scenario, the NPV of avoided costs increases to US\$1.5bn, with an EIRR of 22.9 percent. These results are driven by savings on operating expenses (notably fuel supply) which more than offset the increase in investment costs. Hydropower, despite the relatively high cost of investment, has particularly low operating costs compared to thermal units consisting primarily of fuel costs.

**Table 18: Summary of economic benefits of the OMVG interconnection**

Scenario Name	NPV of Avoided OPEX Costs	NPV of Avoided CAPEX Costs	NPV of Total Avoided Cost	
	USD\$m	USD\$m	USD\$m	EIRR (%)
Base Case	\$1,502	(\$617)	\$885	17.03
Optimistic	\$1,975	(\$461)	\$1,514	22.9
Pessimistic	\$1,020	(\$764)	\$255	12.26

23. GHG accounting was also conducted for the OMVG interconnection. The World Bank guidance on GHG accounting requires comparing the project to an alternative. In the case of an



interconnection project, this would be a different interconnection configuration. The impacts on generation (beyond losses) are beyond the scope of GHG accounting. The original line route was 35 km longer than the project line and this was included in segment 1 of the transmission line. Thus, net emissions reduction is estimated at 392ktCO<sub>2e</sub> with a social value of \$5.1m (using the base value of US\$30 per ton of carbon emissions avoided in 2015, increasing to \$80 by 2050<sup>19</sup>). The interconnection is also considered to have 100 percent adaptation co-benefits as stated in the PAD datasheet. World Bank guidance indicates any new transmission system that facilitates the integration of renewable energy sources such as hydro into the grid are considered adaptation co-benefits.

## Sensitivity Analysis

24. A sensitivity analysis shows that the EIRR is robust for changes in discount rates, oil prices, and project costs. Sensitivity analyses on the economic analysis results are summarized on Table 19. Taking a higher discount rate of 13 percent instead of the base assumption of 10 percent, the NPV is reduced to US\$371m. With a lower rate of 7 percent, the NPV increases to US\$1,770m. The results of the economic analysis are sensitive to underlying fuel prices as alternative sources of power generation without the interconnection. In the base case, a reference price of \$80 per barrel is used. At \$50 per barrel, the NPV reduced to US\$239m with an EIRR of 12.7 percent. With a 30 percent cost overrun, the NPV is reduced to US\$690 with an EIRR of 14.8 percent. Results from additional sensitivity analyses are summarized in Table 19.

**Table 19: Sensitivity analysis**

Discount rate	7%	8%	9%	10%	11%	12%	13%
	<b>\$1,770</b>	\$1,420	\$1,128	<b>\$885</b>	\$682	\$513	\$371

Oil price decreases    **Base:**

Oil price / barrel	<b>\$80</b>	\$70	\$60	\$50
<b>NPV (US\$m)</b>	<b>\$885</b>	\$691	\$496	\$239
<b>EIRR (percent)</b>	<b>17.0</b>	15.7	14.26	12.7

Note a 1:1 correlation is assumed between the price of crude oil, HFO, and Diesel, which is consistent with historical data

OMVG Cost over-run

	10%	20%	30%
<b>NPV (US\$m)</b>	\$820	\$755	\$690
<b>EIRR (percent)</b>	16.2	15.5	14.8

<sup>19</sup> Source: World Bank, Guidance Note “Social Value of Carbon in project appraisal”, July 2014

## Financial Analysis

25. The objective of the financial analysis is to assess whether, and at what transmission tariff, the AMA of the interconnection between the four OMVG countries is financially viable, as well as whether the project improves the financial situation of the participating utilities.

### Assumptions

26. Assumptions used in the financial analysis are consistent with the assumptions used in the economic analysis including timeline of analysis and scenarios used. Output from the economic model is used in the financial model, in particular for volumes generated on the transmission line.

27. The total investment cost is expected be US\$711 million. The project will be funded through concessional loans. Indicative terms for the financing are shown in Table 20 below. Loans will have relatively long maturities (13-40 years, median 25 years) and average interest rates of 1.67 percent.

**Table 20: Financing Available by Lender and Terms of Financing**

Lender	Amount	Participation Rate	Interest Rate	Tenor	Grace Period
	US\$m	%	%	Years	Years
IDA	\$200	28%	0.715	38	6
AfDB	\$135	19%	0	40	10
EIB	\$106	15%	1.28	20	5
ISDB	\$94	13%	2.5	25	5
WADB	\$52	8%	8.5	12	3
AFD	\$52	7%	2.5	25	5
KfW	\$54	8%	0.75	40	10
KF	\$24	3.4%	1.5	20	4
Countries	\$16	2.6%	0	20	7
Total	<b>\$711</b>	<b>100%</b>			

28. Average transmission costs include the following costs, which results in the average transmission costs summarized on Table 21:

- O&M fees (equivalent to 2% of capital costs per year);
- Debt servicing costs (including a 20% debt servicing provision);
- Provisions for large maintenance expenditures (equivalent to 20% of capital investments over 20 years, allocated by the end of the study period);
- Note that actual transmission tariffs between countries will be agreed through the process of developing Transmission Service Agreements with each OMVG country.

**Table 21: Average transmission costs**

Year	Average Transmission Cost (US\$ per kWh)
- 2018-2022	0.0493
- 2023-2027	0.0234
- 2028-2032	0.0140
- 2033-2037	0.0082

### *Results of the financial analysis*

29. The financial analysis confirms that with sufficient tariffs, the AMA of the OMVG will be financially viable and able to cover its cash operating costs, make provisions for the renewal of the assets and to meet its debt services obligations. Based on the assumptions, the project has a financial internal rate of return (FIRR) of 3.84 percent, higher than the cost of capital of 1.67 percent mainly driven by the provision for debt servicing and debt repayment timelines greater than the period of analysis, and a financial net present value of US\$173 million. The debt service ratio stays positive during the operation period, between 1.35 and 1.49 percent.

### *Key Results*

**Table 22: Highlights of projected financial performance of OMVG AMA**

	2018	2019	2020	2021	2022	2027	2032	2037
<b>Income Items</b>								
<b>Revenue</b>	48.8	47.9	66.5	72.6	71.3	61.5	59.3	48.3
- Interconnection revenue	48.8	47.9	66.5	72.6	71.3	61.5	59.3	48.3
- Fiber optic revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Operating Expenses</b>	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
- Structure AGP Fee	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
- O&M Costs	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
- Depreciation and repair allowances	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8
<b>Operating Income</b>	5.9	5.0	23.5	29.7	28.4	18.6	16.4	5.3
<b>Non-Operating Expenses</b>	13.9	13.2	12.3	11.2	10.1	4.8	3.0	1.4
<b>Net Income</b>	-8.0	-8.2	11.3	18.5	18.3	13.8	13.4	4.0
<b>Balance Sheet Items</b>								
<b>Total Assets</b>	741.4	730.6	722.9	716.3	709.4	673.5	629.9	454.0
- Current Assets	10.9	21.6	35.4	50.2	64.8	136.4	200.2	131.7
- Fixed Assets	730.5	709.0	687.5	666.1	644.6	537.1	429.7	322.3
<b>Total Liabilities</b>	745.4	742.8	723.9	698.7	673.5	538.6	427.2	212.7
- Long term Liabilities	739.1	730.2	705.0	673.5	642.0	475.6	332.7	212.7
- Allowances for repairs	6.3	12.6	18.9	25.2	31.5	63.0	94.5	0.0
<b>Total Equity</b>	-4.0	-16.2	-5.0	13.6	31.9	131.0	198.7	237.3
<b>Cash Flow Items</b>								
<b>Cash Flow from Operations</b>	15.7	19.7	37.5	45.8	46.2	42.5	41.2	31.8
<b>Cash Flow from Investing</b>	-752.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Cash Flow from Financing</b>	743.1	-8.9	-25.2	-31.5	-31.5	-28.6	-28.6	-21.0
<b>Net increase in cash held</b>	6.8	10.8	12.3	14.3	14.7	13.9	12.6	10.8
<b>Year-end Cash/Cash Equivalent</b>	6.8	17.6	29.8	44.2	58.9	131.3	195.3	127.7

Financial Ratios		2018	2019	2020	2021	2022	2027	2032	2037
<i>EBITDA</i>	<i>M\$</i>	33.70	32.79	51.31	57.50	56.16	46.38	44.17	33.13
<i>EBDA</i>	<i>M\$</i>	19.8	19.6	39.0	46.3	46.1	41.5	41.2	31.7
<i>Free Cash Flow</i>	<i>M\$</i>	-722.4	32.9	49.8	57.0	56.3	47.3	44.2	33.2
<i>Equity</i>	<i>M\$</i>	-4.0	-16.2	-5.0	13.6	31.9	131.0	198.7	237.3
<i>Debt</i>	<i>M\$</i>	745.4	742.8	723.9	698.7	673.5	538.6	427.2	212.7
<i>Debt Ratio</i>		101%	102%	101%	98%	95%	80%	68%	47%
<i>Debt-Equity Ratio</i>		- 18493%	- 4582%	- 14603%	5145%	2112%	411%	215%	90%
<i>Debt Service Coverage Ratio</i>		1.48	1.49	1.37	1.35	1.35	1.39	1.40	1.48

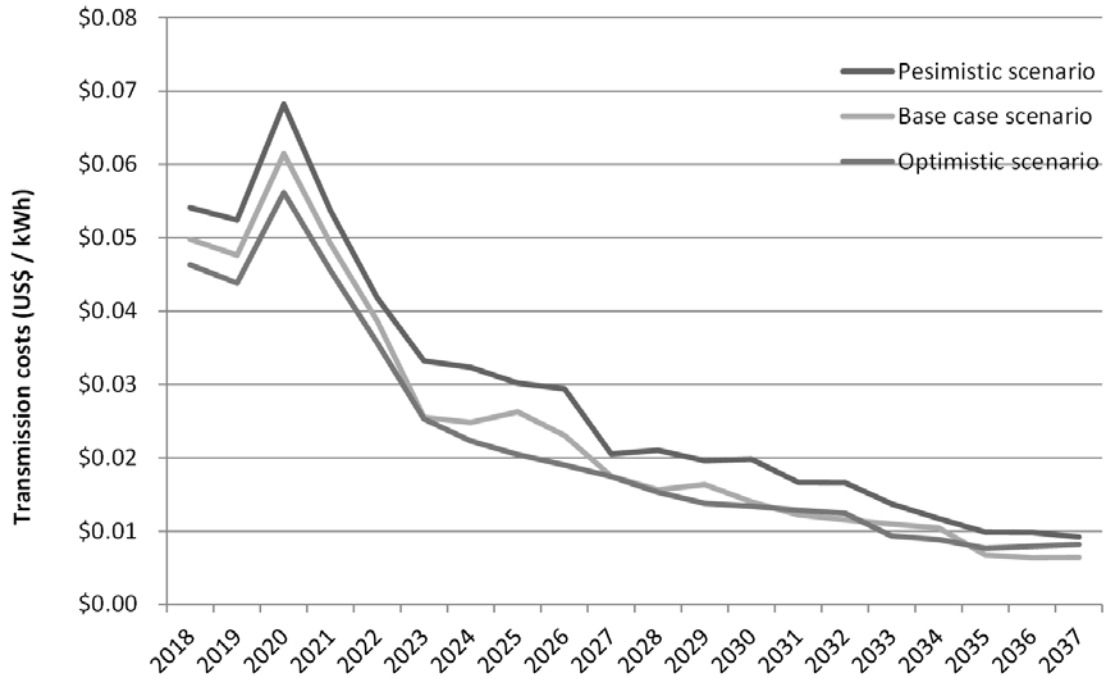
### ***Sensitivity analysis***

30. Average transmission tariffs are sensitive to volumes on the interconnection. In the long run, transmission tariffs are expected to reach international norms in each scenario, as volumes increase over the life of the project and as debt obligations reduce. However in the short run, there is a high risk of high transmission tariffs, of \$0.05 to \$0.07 per kWh. In the pessimistic scenario, transmission costs could reach as high as \$0.07 per kWh without surplus energy coming online. Despite the high transmission tariffs, the total energy cost of energy imports via OMVG in the pessimistic scenario range from US\$0.09-0.15 per kWh, which even with high transmission tariffs is still lower than the cost of alternatives in each country. The results are summarized on Table 23 and Error! Reference source not found..

**Table 23: Sensitivity analysis of generation and transmission costs**

	2018-22	2023-27	2028-32	2033-37
<b><u>Pesimistic scenario</u></b>				
Avg. volume (GWH)	1170	2436	3241	4893
Avg. Generation cost (US\$ / kwh)	\$0.10	\$0.09	\$0.08	\$0.08
Avg. Transmission cost (US\$ / kwh)	\$0.05	\$0.03	\$0.02	\$0.01
<b>Total delivered cost (US\$ / kwh)</b>	<b>\$0.150</b>	<b>\$0.119</b>	<b>\$0.099</b>	<b>\$0.091</b>
<b><u>Base case scenario</u></b>				
Avg. volume (GWH)	1278	3008	4388	6684
Generation cost (US\$ / kwh)	\$0.10	\$0.09	\$0.08	\$0.08
Transmission cost (US\$ / kwh)	\$0.05	\$0.02	\$0.01	\$0.01
<b>Total delivered cost (US\$ / kwh)</b>	<b>\$0.149</b>	<b>\$0.113</b>	<b>\$0.094</b>	<b>\$0.088</b>
<b><u>Optimistic scenario</u></b>				
Avg. volume (GWH)	1386	3373	4460	6276
Generation cost (US\$ / kwh)	\$0.10	\$0.09	\$0.08	\$0.08
Transmission cost (US\$ / kwh)	\$0.05	\$0.02	\$0.01	\$0.01
<b>Total delivered cost (US\$ / kwh)</b>	<b>\$0.145</b>	<b>\$0.111</b>	<b>\$0.094</b>	<b>\$0.088</b>

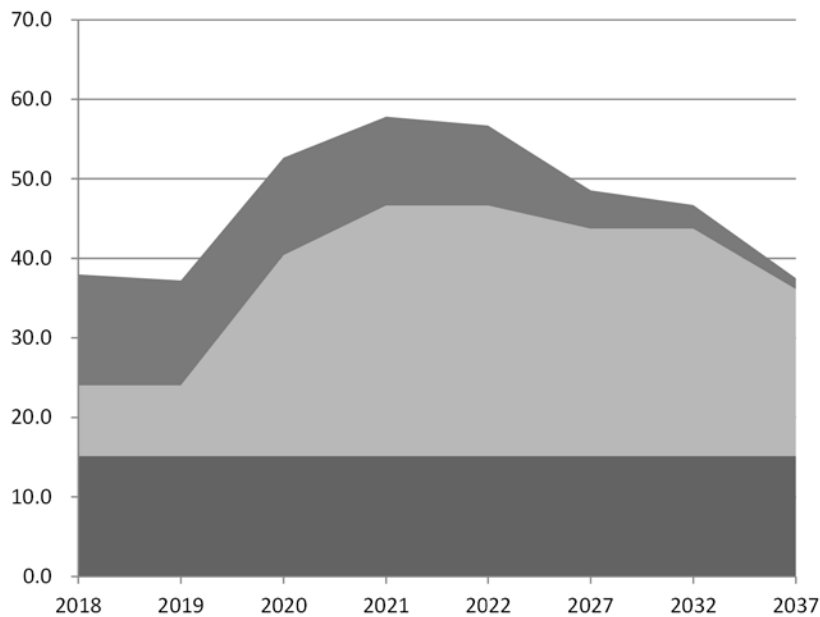
**Figure 7: Sensitivity analysis of transmission costs (US\$ per kWh)**



### ***Fiscal Impact Analysis***

31. The annual all-in cost of the AMA (including O&M costs and debt servicing) is estimated to be approximately US\$ 46.6 million in 2018 to US\$ 51.2 million in 2037, with a maximum of US\$ 72.7 million in 2025.

**Figure 8: Financial Burden of the Project (US\$ million)**



32. The maximum financial burden to each country is indicated in Table 24, ranging from 0.15 percent of 2013 GDP in Guinea, to 1.46 percent of 2013 GDP for The Gambia. PPAs will help to reduce this risk exposure.

**Table 24: Potential Maximum Exposure of Participating Governments (US\$ million)**

	Senegal	Guinea	Guinea-Bissau	The Gambia
Assumed % of payment responsible (based on power sharing agreements using the OMVG line)	54.65%	12.87%	13.76%	18.71%
Maximum government exposure (assume zero OMVG revenues) (US\$m)	38.8	9.1	9.8	13.3
GDP (US\$m, 2013)	15,150	6,193	859	914
Max exposure as % of 2013 GDP	0.26%	0.15%	1.14%	1.46%

***Financial analysis of national utilities involved in OMVG***

33. National power utilities of OMVG countries will benefit financially from trading on the grid:

- a. Exporting utilities, in particular Electricité De Guinée (EDG), benefits from increased revenues and opportunity to exploit hydro power potential.
- b. Importing utilities - NAWEC, EAGB and initially, Senelec – will benefit from reduced generation costs from hydro, and increased ability to meet suppressed demand, leading to increased revenues and greater capacity to increase access to energy and quality of service.

34. This financial analysis focuses on (i) the current financial situation of the involved utilities to understand ability to pay and the risk of non-payment; (ii) the impact of the project on the financial situation, by analyzing the impact of the project on the solvency of the utilities; and (iii) payment enhancement mechanisms and impact on the financial viability of the project, with an objective to see if the utilities will be able to pay and how the governments involved will help make the payments more reliable.

**Table 25: Utilities' Financial Analysis Summary**

Question	Why is it important?	How do we answer it?	Answer
1. What is the current financial situation of the utilities in the four countries?	Utilities will pay interconnection/transmission charges to the OMVG. Their current situation will help understand the risk of non-payment.	Analyze recent financial statements (last 3-4 years) and other information available for each utility.	Senelec net result became positive recently as a result of oil price drop. Other utilities are financially fragile and depend on government subsidies.

2. What impact will the OMVG project have on the utilities' financial situation?	Understand if the project will improve or worsen utilities' finances and their capacity to pay the OMVG.	Compare estimated cost of import through OMVG with average tariff and marginal cost of generation.	Positive short term impact for the Gambia, Guinea Bissau and Senegal (through access to lower cost imports). Positive impact is expected to increase further and broaden in the medium to long term.
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## Financial situation of the utilities

35. Table 26 below summarizes the overall financial situation of the utilities.

**Table 26: Summary of the Financial Situation of the Utilities**

	Senelec (Senegal) 2013	EDG (Guinea) 2012	EAGB (Guinea-Bissau) 2013	NAWEC (The Gambia) 2013
<b>Operating ratio (%)</b>	99%	116%	76%	115%
<b>Net result (U\$ mil)</b>	2.06	-18.77	-1.43	-19.40
<b>Current ratio</b>	74%	75%	81%	79%
<b>Debt ratio</b>	36%	110%	235%	147%
<b>Equity (U\$ mil)</b>	157.96	-14.67	-22.61	-43.29
<b>Creditworthiness</b>	Yes	No	No	No

## NAWEC (The Gambia)

36. The National Water and Electricity Company (NAWEC) Ltd. is a public utility company providing water and electricity in The Gambia. Between 2010 and 2013, there has been increasing demand for water and electricity due to a strong economic growth in The Gambia. The utility operates a thermal power station that runs mainly on heavy fuel oil for the rural areas. Also a utility scale Wind-turbine, operated by the rural community of Batokunku, is connected to NAWEC grid. Technical and commercial losses are estimated to be about 28 percent in 2013 (including 20 percent T&D losses, and 10 percent uncollected bills).

37. The challenge of NAWEC over the past years has been to access sufficient financial resources to enable NAWEC procure fuel and spare parts. With volatile oil prices in the international market, coupled with the need to repair and overhaul some of the engines at Kotu and the Provincial Power Station to ensure the availability of generation capacity, NAWEC had is struggling to meet costs.

38. Fluctuating oil prices and the devaluation in currency have serious consequences for NAWEC as the existing energy tariff under the PPA is indexed with such changes in the oil prices as well as changes in foreign exchange rates. Thus, in the absence of a pass-through mechanism in the retail tariffs for electricity and water, the company is normally left with few options but to continue to rely on some local banks to provide working capital with high interest and bank charges.

**Table 27: Main Financial Results for NAWEC**

Item	Unit	2010	2011	2012	2013
<b>Total revenues</b>	US\$ mil	50.62	54.63	59.69	62.16
<b>Total operating expenses*</b>	US\$ mil	55.87	73.86	69.57	71.20
<b>Operating ratio</b>	%	110%	135%	117%	115%
<b>Net loss</b>	US\$ mil	-18.95	-35.91	-28.55	-19.40
<b>Net cashflow</b>	US\$ mil	-17.06	29.85	-53.98	-9.62
<b>Subsidies</b>	US\$ mil				
<b>Dividends</b>	US\$ mil	0.00	0.00	0.00	0.00
<b>Current ratio</b>	%	39%	21%	71%	79%
<b>Equity</b>	US\$ mil	22.85	-20.37	-26.10	-43.29
<b>Debt ratio</b>	%	86%	111%	129%	147%
<b>Receivables</b>	US\$ mil	11.29	13.57	48.28	65.10
<b>Receivable turnover</b>	Days	75	87	91	111
<b>Payables</b>	US\$ mil	30.20	62.50	71.56	86.27

\* Including the cost of goods sold

39. On timely payment of bills, NAWEC has replaced all conventional electricity meters of all non-critical Government institutions with pre-paid meters and this has contributed to improved collection rates and reduced potential arrears. Furthermore, the recovery of debts owed by Area Councils and some Governments institutions and installation was made possible.

40. NAWEC is facing a high increase of the trade and receivables accounts by 35% between 2012 and 2013, which signals a problem of recovery. Furthermore, negative cash during the last two years entailed a problem of treasury, despite an increase of revenues about US\$ 2.5 million in the same period.

41. The reduction of the gross profit (about 40 percent balance) by an increase of operational costs (about 2.3 percent) despite the increase of revenue (about 4 percent), puts NAWEC in an unbalanced financial situation. Also, the shared capital is negative with a reduction of the net operating expenses of around 59 million. The returns on assets are continually negative resulting from a problem of tariff system.

### **EDG (Guinea)**

42. Electricité De Guinée (EDG) is Guinea's public electricity utility owning and operating all generation, transmission and distribution assets in Guinea. The analysis of EDG's financial performance is based on the *Power Sector Diagnostic and Recovery Study* (2006-2010) and data provided by EDG.

43. EDG has a weak financial position driven by increasing cost of supply. Cost of electricity sold increased by 31 percent annually between 2007 and 2013. Cost of generation increased from US\$ 0.07 per kWh in 2007 to US\$ 0.30 per kWh in 2013, driven by poor hydraulic availability, rising oil prices, and an increase in thermal energy in the power mix from 23 percent in 2007 to 27 percent in 2013 (33 percent in 2012), including power rentals from Agrekko. This resulted in a net income ratio falling from 51 percent in 2006 to 3 percent in 2013. The deterioration was very steep in 2012 when operating costs increased by a factor of 2.6.



44. Despite significant tariff increases, revenues have not been sufficient leaving the utility in a state of insolvency. EDG's revenues have grown by 18 percent per year since 2006 as a result of higher sales and tariff increases in 2008 and 2009. Most of the tariff increase was absorbed by government customers. Between 2007 and 2012, average tariffs increased by 340 percent for government customers, exceeding US\$ 0.25 per kWh, while the tariff for private customers has increased by 80 percent to US\$ 0.10 per kWh. Tariffs have stagnated since then. In 2012, revenues increased by 76 percent to US\$66m, driven by higher collection rate and recovery of bills from previous periods. In 2013, revenues dropped by 27 percent to US\$55m, partly attributable to the arson of two EDG offices following street riots related to lack of electricity.

45. In addition to the burden borne by the Government through higher electricity tariffs, the government also provided a direct subsidy to EDG throughout this period. Operating subsidy reached US\$36 million in 2012. Despite this effort, EDG's financial deterioration has accelerated in 2011/2012. EDG incurred losses of US\$26 million in 2011 and US\$19 million in 2012. This contrasts with the period 2007-2010 when losses were more manageable ranging between US\$0.5 million and US\$2 million a year. 2013's net income was positive only because the amount of operating subsidy has reached a record of GNF 450 billion (US\$64 million).

46. These significant losses over the period 2011-2012 have taken a toll on EDG's balance sheet. Equity has turned negative in 2011 and reached US\$ -15 million in 2012. Extreme financial fragility inhibits EDG from maintaining its production fleet or renewing and rehabilitating its infrastructure. This translates into a constant decrease of assets' book values and a risk of increased dilapidation of infrastructure under a lack of investment renewal, and testifies to the need for recapitalization of EDG coupled with a restructuring of the company.

**Table 28: Main Financial Results for EDG- Guinea**

Item	Unit	2010	2011	2012
<b>Total revenues</b>	US\$ mil	75.13	61.15	136.46
<b>Total operating expenses*</b>	US\$ mil	71.28	78.73	157.90
<b>Operating ratio</b>	%	95%	129%	116%
<b>Net result</b>	US\$ mil	-1.58	-25.77	-18.77
<b>Net cashflow</b>	US\$ mil		-3.24	7.12
<b>Subsidies**</b>	US\$ mil	0.09	0.00	35.80
<b>Dividends</b>	US\$ mil	0	0	0
<b>Current ratio</b>	%	152%	98%	75%
<b>Equity</b>	US\$ mil	22.98	-6.17	-14.67
<b>Debt ratio</b>	%	83%	106%	110%
<b>Receivables</b>	US\$ mil	60.09	40.58	47.22
<b>Receivable turnover</b>	Days	292	242	126
<b>Payables</b>	US\$ mil	53.04	49.03	68.84

\* Including the cost of goods sold

\*\* Subsidies on operation

47. Revenues are expected to grow considerably over 2014-2016, about 60 percent per annum. This is mainly driven by (i) the increased level of energy injected into the grid subsequent to the commissioning of Kaleta hydro plant and Kipe thermal plant (ii) increased tariffs: the government is looking into possibility to increase the average tariff by 10 percent before the end of 2014; and

(iii) improved bill collection resulting from the EDG Management. Gross profit margin in percentage is unchanged in 2014 and declines by 24 percent in 2015 which is expected to be the most difficult year for EDG financially. Operating subsidy requirements will increase to US\$ 86 million) in 2015 because of a more frequent recourse to thermal generation to meet increased demand, resulting in an increasing fuel bill. Fuel bill will decline by about 30 percent between 2015 and 2018 with the commissioning of Kaleta which will have a positive impact on gross profit margin. The Operating subsidy is expected to decline by two thirds in 2016 and almost fully phased out by 2018. This positive turnaround is based on three main conditions: i) the commissioning of Kaleta on time and that is key in reducing EDG's reliance on fuel for generation; (ii) the ability of the EDG management contractor to implement the sector recovery plan successfully, which in turn depends on government support; and (iii) the reliability of baseline data from which the quality Operator will be starting in 2014.

### **EAGB (Guinea-Bissau)**

48. Electricidade e Aguas da Guine-Bissau (EAGB) is a public company with administrative and financial autonomy, founded in 1983 by Decree No. 32/82. EAGB is responsible for production, transmission, and distribution of electricity and water in Guinea-Bissau, as well as the development plan implemented the government. The company was reorganized in 2005 after a long civil war (1984-1997).

49. EAGB has a very weak financial standing due to a lack of strong legal and corporate governance. EAGB is managed by a board of directors, composed of at most 9 representatives from the Ministry of Natural Resources and Industry, Ministry of Economy and Finance, Secretary of State, Local communities, Industries, EAGB's Director-General and staff. The board has not met since 2005. The financial statements of the company were not approved between its creation in 1983 and 1990. The legal status of EAGB has not been updated to comply with the Organization for the Harmonization of Business Law in Africa (OHADA) standards. Legal status and ownership of most EAGB assets are not defined due to the lack of agreements with the Government.

50. In 2012, EAGB's revenue was US\$ 10.1 million with operating expenses of US\$ 17.1 million, which gave an operating ratio of 170 percent. Net results stayed negative at US\$ -7.53 million, due to large non-ordinary losses. Equity stayed negative at US\$ -30.8 million, and the debt ratio was high at 244 percent in 2012. Receivables stand at US\$ 14.8 million, due to uncollected bills and historical debts. To solve the collection problems, pre-paid accounts were adopted, which can ensure payment upon recharge. In the beginning of 2014, 320 pre-paid accounts were added each month, reaching 16,580 total pre-paid accounts installed and registered.

**Table 29: Main Financial Results for EAGB- Guinea-Bissau<sup>20</sup>**

Item	Unit	2010	2011	2012
Total revenues	US\$ mil	6.16	7.88	10.05
Total operating expenses	US\$ mil	4.67	15.48	17.11
Operating ratio	%	76%	197%	170%

<sup>20</sup> Consolidated financial statements including both electricity and water operations

Net result	US\$ mil	-1.43	-0.73	-7.53
Net cashflow	US\$ mil	N/A	N/A	N/A
Subsidies	US\$ mil	1.06	9.81	N/A
Dividends	US\$ mil	0.00	0.00	0.00
Current ratio	%	81%	N/A	N/A
Equity	US\$ mil	-22.61	-23.26	-30.79
Debt ratio	%	235%	261%	244%
Receivables	US\$ mil	14.07	9.45	14.84
Receivable turnover	Days	834	438	539

\* Including the cost of goods sold

### Senelec (Senegal)

51. The overall financial situation of Senelec, Senegal's national electricity company, is weak, mainly driven by high and increasing generation costs, low revenues, cash constraints, high debt ratio, and a lack of repayment capacity. Despite tariff adjustments between 2007 and 2009, tariffs have not kept up with the increases in costs of generation. The government of Senegal decided to avoid further tariff increases and provide utilities subsidy payments instead.

52. At the end of 2011, the level of un-served demand reached 250 GWH of which half is due to lack of fuel. As a result, Senegal registered 270 days of load shedding, leading to growing customer dissatisfaction and lower levels of bill collection. Without subsidies, Senelec would have faced additional cash constraints. Despite a \$21m subsidy, Senelec had a net loss of \$700,000.

53. Senelec posted a profit of US\$200,000 in 2013. This was driven by a 3.82 percent increase in turnover between 2012 and 2013, 4.5 percent increase in demand, and reduced costs. Installed capacity increased by 60 MW through new power plants and increase imports from OMVS (due to commissioning of Felou). This allowed a 58 MW reduction in diesel rentals. Costs also fell as oil price fell (fuel cost decreased from 102 percent of sales in 2012 to 88 percent of sales in 2013), and financial costs decreased as the result of cancellation of some debts. While repayment capacity improved, Senelec was still unable to meet its short-term commitments.

**Table 30: Main Financial Results for Senelec- Senegal**

Item	Unit	2010	2011	2012	2013
Total revenues	US\$ mil	529.00	531.93	856.93	803.98
Total operating expenses*	US\$ mil	707.68	774.58	881.83	794.98
Operating ratio	%	134%	146%	103%	99%
Net profit/loss	US\$ mil	-111.09	-11.66	-17.77	2.06
Net cashflow	US\$ mil	-6.47	4.12	-20.25	236.48
Subsidies	US\$ mil	56.68	219.07	241.57	161.93
Dividends	US\$ mil	0.00	0.00	0.00	0.00
Current ratio	%	104%	92%	103%	74%
Equity	US\$ mil	175.24	173.64	208.84	157.96
Debt ratio	%	42%	50%	44%	46%
Receivables	US\$ mil	462.05	612.80	601.36	481.61
Receivable turnover	Days	60	76	71	53
Payable	US\$ mil	524	502	-20.68	233.66

\* Including the cost of goods sold

54. With the commissioning of Tobene IPP, the rehabilitation of existing plants, power imports from Mauritania, the commission of Sendou I, and increased regional hydropower and other operational measures, the financial position of Senelec is expected to improve. Over the coming years, the Government may still have to provide subsidies, though at a declining level. The revenue gap for 2014 is estimated at about US\$ 200 million, and about US\$ 170 million to US\$ 93 million for the following three years 2015-2018.

### Analysis of financial impact of the OMVG interconnection on national utilities

55. The interconnection is forecasted to have a positive impact on the financial health of each of the electricity utilities. The short run financial impact was estimated using the following assumptions:

- Average end-consumer tariffs remain constant through to 2018
- Without the interconnection, existing cost structures remain constant in The Gambia and Guinea-Bissau. Projects already under construction or financed are assumed to come online in Guinea and Senegal.
- With the interconnection, a portion of demand in each country is met through trade with neighbors, following results from the base case economic analysis.

**Table 31: Forecasted Utility financials with and without OMVG (2018)**

	NAWEC (Gambia)	EDG (Guinea)	EAGB (Guinea- Bissau)	SENELEC (Senegal)
Total Revenue	\$105	\$242	\$30	\$1,035
<b>WITHOUT OMVG</b>				
Total Operating cost w/o OMVG	\$173	\$269	\$45	\$1,026
<b>EBITDA w/o OMVG</b>	<b>(\$69)</b>	<b>(\$26)</b>	<b>(\$15)</b>	<b>\$9</b>
<b>WITH OMVG</b>				
Total Operating cost w OMVG	\$104	\$265	\$10	\$965
<b>EBITDA w OMVG</b>	<b>\$1</b>	<b>(\$22)</b>	<b>\$20</b>	<b>\$70</b>
% reduction in cost of supply (wOMVG vs w/o OMVG)	<b>-40%</b>	<b>-1.4%</b>	<b>-78%</b>	<b>-6%</b>

56. Taking these assumptions, and other assumptions in the financial base case, Table 31 summarizes the forecasted financial impact of the OMVG interconnection in 2018. The financial impact on each utility is expected to be positive. NAWEC and EAGB have the most significant impact in the short run, with average cost of supply reduced significantly as a result of accessing lower cost imports. The earnings before interest, taxes, depreciation, and amortization (EBITDA) improves in each utility, turning from negative to positive for NAWEC and EAGB, and expected to increase Senelec's EBITDA by almost US\$80 million. This positive impact on utility financial health in the short term is expected to increase over the medium to long term as transmission tariffs reduce and additional regional projects are commissioned.

## ANNEX 5: Africa Map

### AFRICA: OMVG Interconnection Project (P146830)

BRD 41541

